

A Holistic Approach to Addressing WSUD Capacity Issues in Local Government

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Abstract

Despite a range of WSUD guidelines being available, and a range of WSUD projects being undertaken by local government, their ability to sustain water management practices is limited as they do not address fundamental capacity issues. This paper describes the development of a suite of initiatives directed at building capacity for WSUD within Fairfield City Council. A key outcome of these initiatives has been the development of a WSUD Strategy and technical guidelines for Council, which provides for the practical implementation of WSUD principles and integration with Council business. The strategy and guidelines have been supported by a range of other capacity building initiatives, to ensure the sustained uptake of WSUD through Council. The paper concludes with some examples of the information included in the WSUD Strategy and technical guidelines.

Introduction

Water Sensitive Urban Design (WSUD) in Australia has evolved from its early association with stormwater management to provide a broad framework for sustainable urban water management. As identified by Brown et al (2006), there are a range of capacity building interventions associated with the successful implementation of WSUD principles and practices. These interventions cover the spheres of human resources, intra- and inter-organisational capacity, external rules and incentives and include: knowledge building, professional development, organisational strengthening, directive reforms and facilitative reforms (Brown et al 2006).

While a combination of these elements has been identified as necessary to facilitate the successful adoption of WSUD by organisations, it is typically the case that organisations implement WSUD on a project by project basis without the necessary breadth of capacity building activities. As such many of these initiatives do not lead to the sustained adoption of WSUD by organisations.

A key failing of WSUD within local government is the lack of alignment between water policies and targets and water management practices. Broad policies need to be translated into practical design guides and advice that are of direct relevance in a local context and which will enhance the knowledge, ability and confidence of developers, builders, planners and council staff in water management options and techniques.

Ecological Engineering is working with Fairfield City Council to implement a comprehensive WSUD Strategy. This paper outlines how a range of capacity building interventions were included in the project. The project has developed a high level management guide establishing principles and objectives for WSUD, which is complemented by Council-specific technical guidelines with fact sheets and case study examples. These documents embody knowledge building and directive reforms. The project also included capacity building interventions of other types: a series of training workshops facilitated professional development, while fostering WSUD champions contributed to organisational strengthening. Fairfield Council is now considering appropriate facilitative reforms to assist in the adoption of the WUSD Strategy in Council.

Background

Fairfield City Council is located in south-western Sydney, and comprises two distinctive sections:

- The eastern section is located in the Georges River catchment and is largely urbanised.
- The western section is located in the Hawkesbury River catchment and is largely rural.

Within the urban area, much of the open space is centred around five creeks. Some creeks have been channelised and some have been retained in a natural form, however all of the creeks have been affected by the increased quantity and decreased quality of runoff associated with urban development, and pressures on the creeks continue to increase as additional development occurs.

Council currently undertakes a large number of projects in the urban environment; most of them with the potential to impact on the water cycle. Examples of these projects include streetscape upgrades, park and sports field upgrades, building and other facilities upgrades (e.g. leisure centres and other Council buildings), and town centre improvements. In addition, Council runs two significant industrial facilities at the Works Depot and Hassall Street Recycling Centre for building materials.

Council is active in the field of water cycle management, and has done extensive work in recent years on several water cycle management programmes and projects, including:

- Strategic Plan for the five major creeks within the LGA as a focal point for recreation and other community activities.
- Water Conservation Plan, outlining water reduction practices and projects for Council.
- Stormwater works programme, which includes a number of stormwater quality and quantity improvement projects over the next five years.
- Creekcure programme, which involves the community in riparian restoration projects.
- A major study on the geomorphology of local creeks.
- A Water Management Plan is currently being prepared to establish a framework and funding mechanisms for water management activities.

Council's Environmental Management Plan also sets long-term water cycle management goals. Council sought to build on their high level of activity around water and environmental stewardship by developing a WSUD Strategy. The strategy sought to be an over-arching framework and philosophy to guide water management in Council activities.

Existing guidelines for the implementation of WSUD

There are a range of WSUD guidelines and practice notes available to local government including *Australian Runoff Quality* (Wong (Ed) 2006), the Department of Environment and Climate Change *Managing Urban Stormwater* documents (EPA 1997a, 1997b, 1998), *WSUD Technical Guidelines for Western Sydney* (UPRCT 2004), and *WSUD Engineering Procedures: Stormwater* (Melbourne Water 2005). While there are a large number of documents available, each has a particular focus and target audience. Most of the guidelines offer either high level WSUD management and strategy advice or technical design information.

Figure 1 illustrates how there is a gap not covered adequately by existing guidelines. This gap is key to local government implementation of WSUD, as local governments need to be able to manage the whole project development process from initial planning to ongoing maintenance of the finished product.

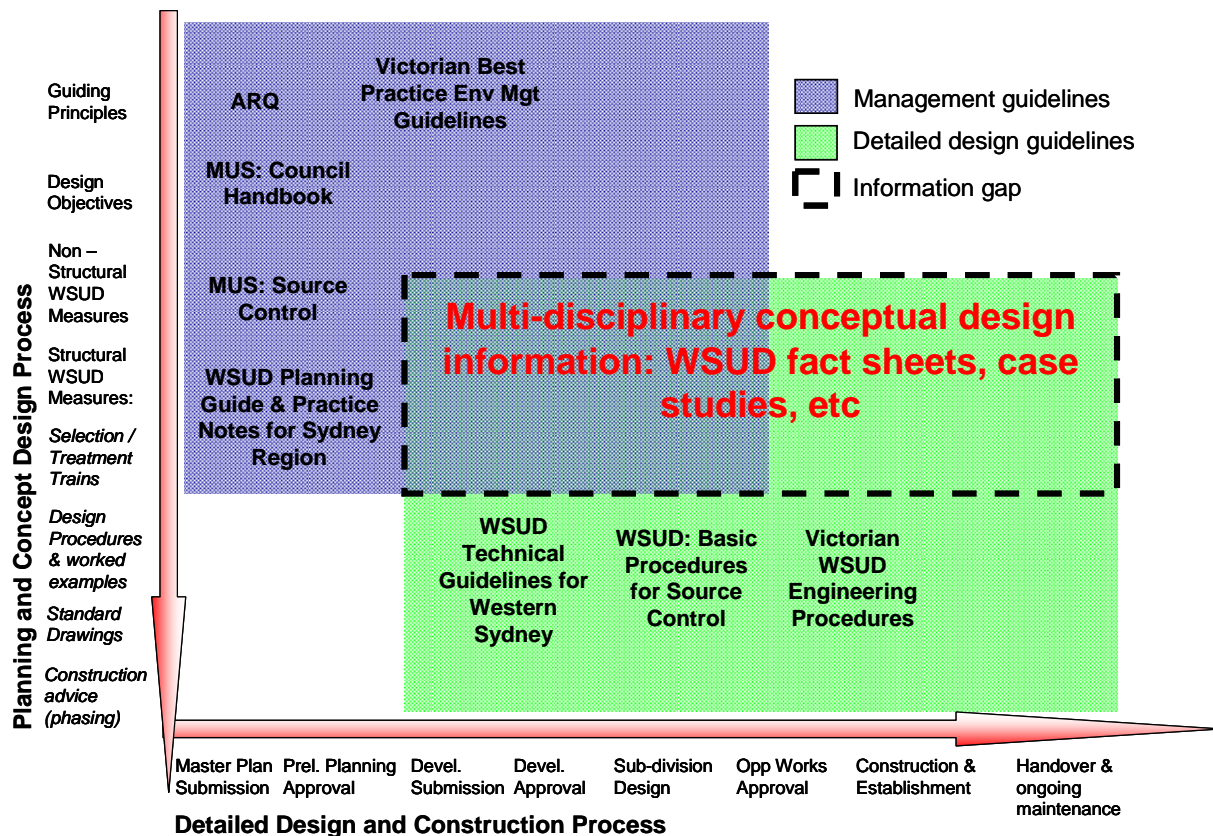


Figure 1: Guidelines relevant to the planning and project delivery process (adapted from Ecological Engineering 2005b)

In addition to the information gap illustrated in Figure 2, there are other limitations with existing guidelines:

- Guidelines are not integrated into councils' project management and decision-making processes.
- Guidelines are not necessarily consistent with local conditions at the LGA scale, and do not take into account local studies including rainfall, hydrology, ecology and soils, and relevant knowledge held within councils in related disciplines.
- Guidelines are often developed without local input and without taking into account the needs of the stakeholders including developers, builders, council staff and residents.
- Guidelines are rarely accompanied by training to raise awareness and ensure uptake within councils.

Organisation capacity assessment

While State government and other water management initiatives have been shown to raise awareness of improved urban water management, they have had limited success in achieving sustained changes in water management practices. Capacity building interventions tend to be more successful when undertaken as a range of interventions across different aspects of capacity building, rather than an isolated intervention (Brown et al 2006). Investigations into local government's capacity to implement WSUD have shown that the main constraints to implementation are the lack of: funds, commitment, long-term framework and direction and knowledge of potential solutions (Ecological Engineering 2005a). This range of issues needs to be addressed.

A project undertaken by Melbourne Water establishes a framework to assess barriers and gaps in local government's capacity to implement WSUD (Ecological Engineering 2006). That project distilled local government capacity into the following ten factors:

1. Knowledge and skills
2. Council commitment
3. Organisational structure
4. Policy and planning mechanisms
5. Planning and design of water projects
6. Implementation of water projects
7. Operation and maintenance of water projects
8. Corporate reporting
9. Community involvement
10. Intra-government / institutional relationships

These ten factors include elements of each of the five types of interventions outlined in Brown et al (2006). They formed the framework for the Fairfield Council WSUD Strategy project. An organisation capacity assessment was undertaken at Fairfield Council to understand which capacity issues may constrain implementation of WSUD in this case.

Identification of Council Capacity to implement WSUD

At the beginning of the project, a series of interviews were conducted with council staff to identify existing capacity for WSUD and key capacity building needs. Outcomes of the interviews are summarised in Table 1.

Table 1: WSUD capacity in Fairfield City Council

Factors	Existing capacity	Key capacity building needs
Knowledge and skills	Some awareness of WSUD	Technical information and training on planning, design, costing, construction, maintenance
Council commitment	Existing culture of water use minimisation; Staff interest and enthusiasm	Commitment of the senior management team and Councillors
Organisational structure		Leadership by WSUD champion/s; Co-operation of staff from all sections of Council
Policy and planning mechanisms	Existing funding mechanism	Integration of water management activities in Council
Planning and design of water projects	Recent water management projects have included new wetlands and other relevant projects	Tools directed at planning, design, maintenance and monitoring; Examples demonstrating integration of water management features into the urban design
Implementation of water projects		
Operation and maintenance of water projects		
Corporate reporting	Strategic vision and broad goals set in existing plans	Quantifiable targets

Factors	Existing capacity	Key capacity building needs
Community involvement	Ability for Council to lead change in the community	
Intra-government / institutional relationships	Key staff have existing relationships	

The interviews, and subsequent qualitative assessment of the institutional capacity of Council, showed that while some Council staff had had some exposure to WSUD, most staff did not have a clear understanding of the key principles, scope or application of WSUD. While Council knew of some of the guidelines available to assist with the application of WSUD, they had found that these guidelines were either too generic or too specific to aid the implementation of WSUD.

Addressing capacity issues

The project was designed to overcome a series of impediments identified by Council and through the interview process to develop a comprehensive WSUD strategy. The Strategy was designed to:

- Address awareness, skills and behavioural change to facilitate WSUD.
- Establish a council commitment and vision for WSUD.
- Address the deficit in council-specific WSUD design information for general consumption by staff in Council, and the lack of leadership by the State government in establishing water quality targets and objectives.
- Develop Council leadership in WSUD whereby Council implements WSUD in its projects prior to requiring developers to do the same.

The WSUD Strategy includes a suite of initiatives, directed at building capacity for WSUD within Council. A key outcome of these initiatives has been the development of a WSUD Strategy and technical guidelines for Council, which provides for the practical implementation of WSUD principles and integration with Council business. Associated with the development of the strategy, a comprehensive suite of initiatives were undertaken, including:

- Establishment of WSUD principles and objectives specific to Fairfield Council.
- Development of technical planning and design information to facilitate the practical implementation of WSUD in Council activities.
- Development of easy to interpret design curves of WSUD elements to assist the understanding of treatment measure sizing requirements.
- A series of practical case studies on the incorporation of WSUD into everyday activities in Council, prepared with assistance from Council staff.
- Training workshops with a broad section of council staff, to introduce the WSUD Strategy and the documents and tools associated with it.
- Presentations to management staff.

The main elements of the project, and the capacity building focus for the project, are highlighted in Table 2. Some examples of unique elements of the project are discussed in more detail in the following sections.

Table 2: Elements of the WSUD Project

Component	Description	Capacity building focus
WSUD Strategy	<ul style="list-style-type: none"> ▪ High level information on water management in Fairfield ▪ Step-by-step process for implementing WSUD on a typical council project 	<ul style="list-style-type: none"> ▪ Knowledge and skills ▪ Policy and planning ▪ Planning and design
WSUD Policy	<ul style="list-style-type: none"> ▪ Principles and objectives for WSUD 	<ul style="list-style-type: none"> ▪ Policy and planning ▪ Council commitment ▪ Corporate reporting
Fact Sheets	<ul style="list-style-type: none"> ▪ Practical information on WSUD elements, including: <ul style="list-style-type: none"> ▪ Suitable locations ▪ Key design considerations ▪ Sizing curves ▪ Typical maintenance requirements ▪ Sources of further information ▪ Examples in Sydney 	<ul style="list-style-type: none"> ▪ Knowledge and skills ▪ Planning and design ▪ Implementation ▪ Operation and maintenance
Case Studies	<ul style="list-style-type: none"> ▪ Case studies demonstrating the potential implementation of WSUD on typical council projects, including a park upgrade and a streetscape upgrade. 	
Supporting Information	<ul style="list-style-type: none"> ▪ Soil specifications ▪ Vegetation lists ▪ Construction and maintenance cost information 	
Training	<ul style="list-style-type: none"> ▪ Series of training workshops with Council 	
On Site Training	<ul style="list-style-type: none"> ▪ In house training of key staff on the application of WSUD and modelling 	<ul style="list-style-type: none"> ▪ Organisational structure
Presentations to management	<ul style="list-style-type: none"> ▪ Presentations to senior executive staff 	<ul style="list-style-type: none"> ▪ Organisational structure ▪ Council commitment

Technical planning and design information

The WSUD strategy document includes a framework for implementing WSUD on Council projects, which is a step-by-step process that can be applied on any project. The framework is shown in Figure 2. This framework has been developed to make it easier for council project staff to conceptualise the application of WSUD concepts as part of everyday projects. Each step in the framework is elaborated in the strategy document.

The other main source of technical planning and design information is the Fact Sheets. These will become a key reference for Council staff who plan and design WSUD elements for projects. They are intended for a technical audience without specific skills in hydrology, hydraulics or water quality treatment. Some staff may only use the introductory information

in each fact sheet, while others are likely to go straight to the design curves and other technical information.

The fact sheets are not intended as a complete design guide for WSUD elements, as there are other design guidelines available (for example, the *WSUD Technical Guidelines for Western Sydney*, UPRCT 2004). Rather they are intended to provide enough information to allow Council staff to integrate WSUD into the planning and design process on typical council projects, such as streetscape and park renewal projects.

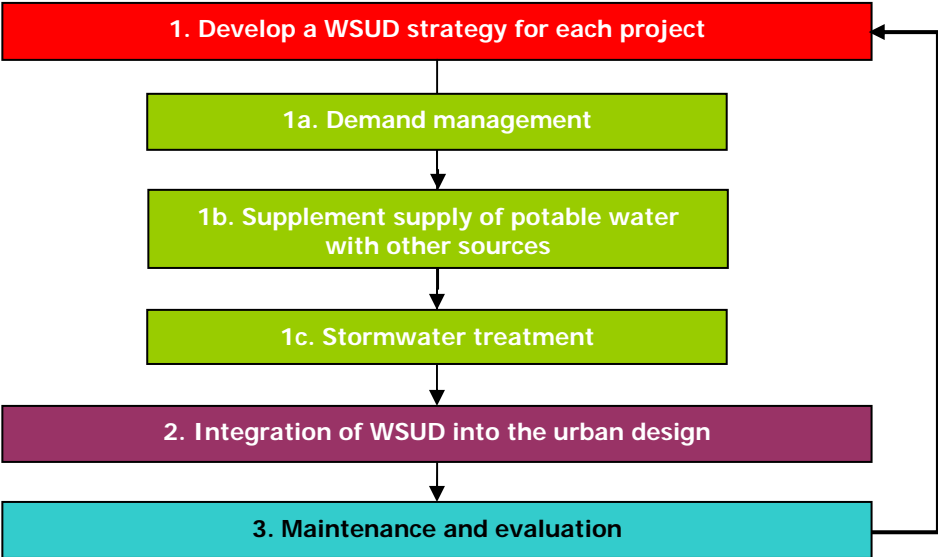


Figure 2: Framework for implementing WSUD on Fairfield City Council projects

Sizing charts

A key part of the WSUD Fact Sheets is a set of sizing charts for rainwater tanks, swales, bioretention systems and wetlands. The sizing charts can be used by planning and design staff as an initial estimate of treatment area requirements, or as a check on completed designs, to ensure that they are sized appropriately, without the need to set up a water quality model.

The sizing charts were developed using rainfall and evaporation data local to the LGA. An example (for bioretention systems) is shown in Figure 3. This sizing chart is based on typical bioretention system depths and the treatment surface area is expressed as a percentage of the catchment area. Removal rates are presented for suspended solids, phosphorus and nitrogen, for a selection of different impervious fractions.

Bioretention sizing chart with respect to impervious fraction:
 extended detention = 0.2 m, filter depth = 0.5 m, filter material = sandy loam

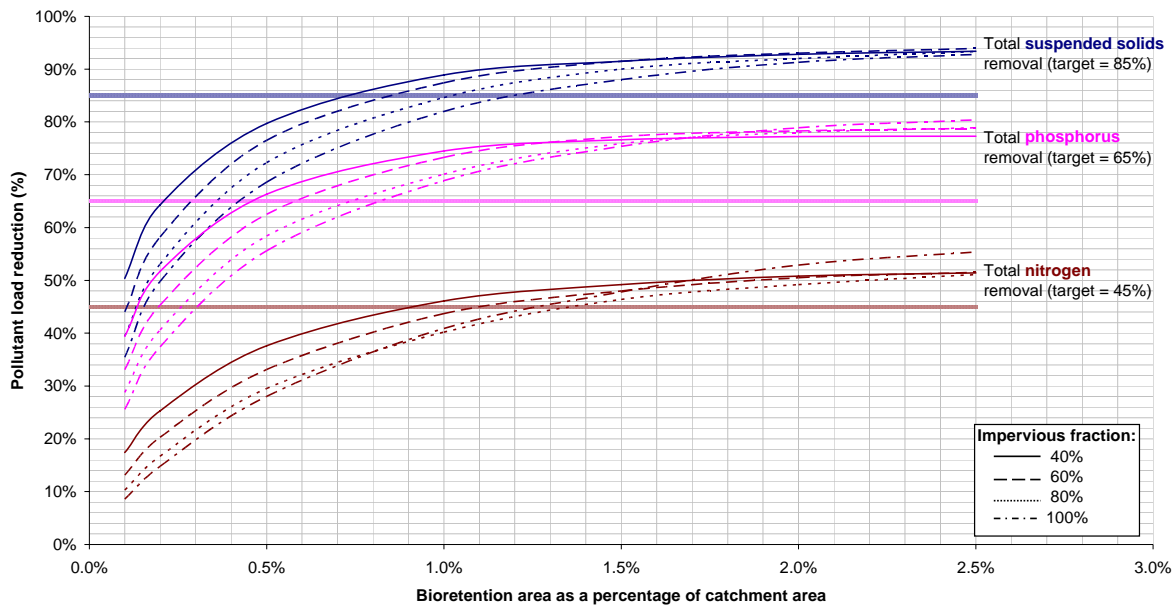


Figure 3: sizing chart for bioretention systems in Fairfield LGA

Conclusions

The successful implementation of WSUD depends on an integrated approach that addresses all factors of capacity building including technical and non-technical needs of an organisation. Existing WSUD guidelines are not sufficient on their own to enable widespread adoption of WSUD in local government. Successful implementation of the WSUD Strategy in Fairfield City Council will be facilitated by:

- A clear policy commitment and senior management support.
- A mechanism to integrate WSUD with typical council projects.
- Relevant and accessible technical guidelines.
- Training to enable staff to make WSUD part of everyday council activities.

Staff who have attended training workshops on WSUD have indicated that the training has been relevant to their needs and has increased their knowledge of WUSD and confidence in applying it to their work.

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