

## What's in an acronym: SuDS vs WSUD



In this briefing Alan Hoban, Healthy Waterways, and Jonathan Glerum, CIRIA, outline the differences and similarities in how Australia and the UK manage their water resources.

### Introduction

Comparing Australia and the UK can be a thankless task for Brits. For every rugby world cup triumph, there are many more Ashes white-washes or Wimbledon victories. And then there's the food and wine, work-life balance, beaches and the climate. However, surprisingly it is the climate where parallels can start to be made, particularly when discussing water management activities.

Extremes in weather patterns – in Australia the lack of available water and extreme events, and in the UK the serious flood events that now seem to occur regularly – has led to a change in the way urban surface water is managed.

In the UK this has encouraged the use of sustainable drainage systems (SuDS) over the past 10 years or so. Recent developments have meant that SuDS are likely to become more mainstream, particularly within new builds. The recent Flood and Water Management Act 2010 has called for national standards to be developed for SuDS, which Defra are in the process of completing. These standards, which will be applicable to new and redevelopments, will help developers and consultants meet the standards set by the new SuDS advisory boards (SAB).

In old developments it has proven to be more difficult to incorporate or retrofit SuDS and urban surface water management practices. New guidance is being developed to help with this, but will not be published until late 2011.

Comparing Australia and the UK may be excessive but there are many similar challenges and barriers that need to be overcome to successfully achieve the integration of SuDS into the urban environment (or water sensitive urban design as it is known as in Australia).



Figure 1 *The Ashes* (courtesy Trinity Mirror plc <[www.mirror.co.uk](http://www.mirror.co.uk)>)

One of the UK's largest challenges is the need to overcome the siloed approach that is often taken when developing urban environments, with engineers, urban planners and designers not working together. This approach ensures that it is extremely difficult to integrate solutions effectively, with multiple stakeholders not considered throughout the process.

This lack of integration means that many benefits are not established and reached – reducing the effect of one of the most significant advantages of sustainable drainage. When individuals and separate organisations do not communicate, funding becomes more difficult to obtain. In this economic climate being intelligent about the use of money and where it comes from is vital.

### Notes from a big country – Australia

In Australia, the incorporation of sustainable drainage and other successful water management practices has been developed over the past 40 years, with significant activity in the last 10 years. Water cycle management – dealing with issues concerning drinking water, stormwater runoff,

waterway health, sewage treatment and water reuse and recycling – has an important role to play in urban areas. Water sensitive urban design (WSUD), which ensures that water cycle management is integrated into urban planning and design, is endorsed by the Australian Government, most state governments, and many local governments.

## WSUD

Water sensitive urban design (WSUD) is an approach to the planning and design of urban environments that supports healthy ecosystems, lifestyles and livelihoods through smart management of all waters. Australia's National Water Commission defines water sensitive urban design as ensuring "...that urban water management is sensitive to natural hydrological and ecological cycles. It integrates urban planning with the management, protection and conservation of the urban water cycle".

Figure 2 (page 2) illustrates how the water cycle works in natural and urban areas. The diagram on the right highlights the potential benefits of WSUD in achieving a more natural hydrologic regime.

The phrase "water sensitive urban design" was first coined in the early 1990s, but it wasn't until about 10 years later that there was an alignment of science, technology, willing developers and government support, and on-ground projects started to be delivered. The main focus of WSUD in its early years was to reduce the stormwater pollution, which was affecting several iconic waterways and waterbodies, and as a result many co-operative research centres (university and industry partnerships) have made significant advances in stormwater wetland and bio-filtration technology.

Importantly, performance targets (design objectives) for these technologies have been set according to an economic best practice philosophy, with a view that performance targets will evolve with advances in technologies. This has been an important factor in increasing the support of land developers to adopt WSUD and in building political support for regulation. While there is support for WSUD at an Australian Government level, most land-use and water planning occurs at the level of state and local government. To successfully integrate WSUD, state and local government planning policies need to be updated to ensure WSUD is considered at the start of development projects, rather than as an

afterthought. Some states (notably Queensland and Victoria) are advanced in adopting planning regulations, but, just as with climate, there are notable differences across the country.

Another important factor in Australia has been the strong coupling of WSUD with landscape architecture to create meaningful and appealing urban environments.

Much of Australia has been in serious to extreme drought over the past 10 years (dubbed the millennium drought). During this time WSUD practice responded to water supply security concerns through the following:

- rainwater tanks have become mandatory for new dwellings in most states
- dual-reticulated developments emerged (with separate potable water and recycled water pipes to dwellings)
- stormwater harvesting has become a major focus of research and government infrastructure funding.

However there are two major issues yet to be resolved. Firstly, much of the activity in Australia has focused on new greenfield developments but the challenge of addressing existing urban areas (retrofitting) is profound. Secondly, much of the new WSUD infrastructure is not supported by appropriate asset management systems and processes, and concerted capacity building efforts are needed in this space.

## Notes from a small island – the UK

So, can the UK learn from these Australian practices, and also from the work completed in other countries such as the USA and Germany?

WSUD practices in Australia have evolved to include more than just sustainable drainage practices. The development and adoption of water quality improvement standards across local governments has been important for adopting WSUD techniques and serious drought conditions have contributed to raising public awareness of water supply issues.

This is mirrored in the UK by the devastating flooding of recent years. In 2007, much of the flooding was attributed to urban water runoff and sewer overload, and this has only helped to raise awareness for the need of better urban water management practices.

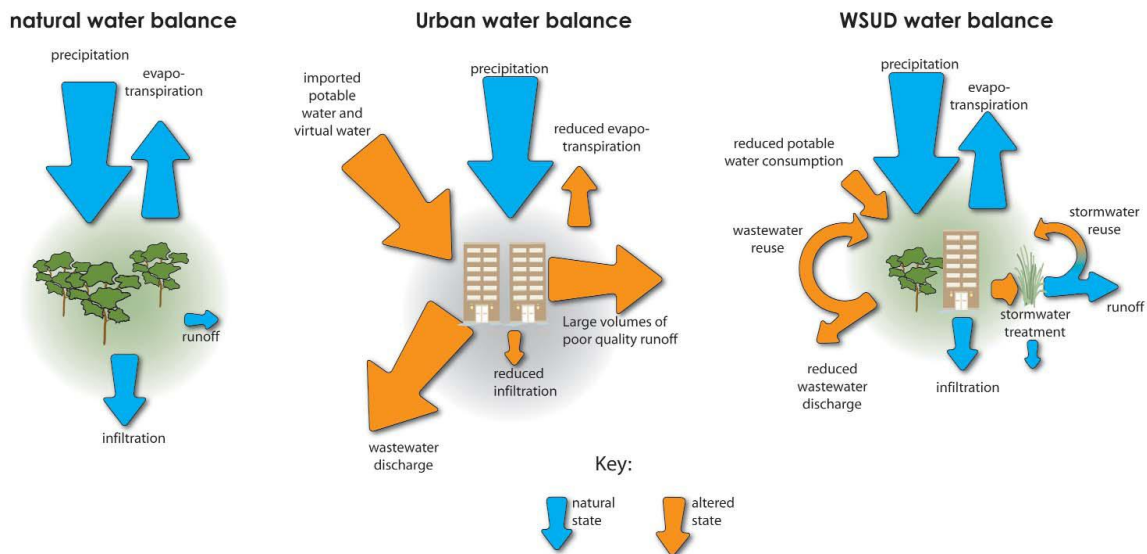


Figure 2 The multiple benefits of WSUD (from Hoban and Wong, 2006)

The Floods and Water Management Act 2010, the Flood Risk Regulations 2009, the Water Framework Directive (WFD) and climate change will all have a significant effect on urban water management practices in the UK and valuable lessons can be learnt from abroad. Flood risk and planning policy are already integrated through PPS25 (CLG, 2010), water efficiency is integral to sections of the building regulations and the *Code for Sustainable Homes* (CLG, 2008), and stringent water quality levels are set and adhered to.

Now opportunities need to be realised that encourage the development of close working relationships between the multiple stakeholders involved in urban water management practices. In the UK, this includes drainage and highway engineers both in local authorities and consultancies, water and sewage companies, spatial planners, urban designers, landscape architects, developers and emergency planners.



Figure 4 Water conservation sign during the peak of the "millennium drought", Brisbane, Australia (courtesy A Hoban)



Figure 3 Appealing urban design: a boardwalk through a constructed stormwater wetland in Lynbrook Estate, Victoria, Australia (courtesy A Hoban)



Figure 5 Surface water being effectively managed on a redevelopment site in Stamford (courtesy B Bray)

## Conclusion

The progression of WSUD in Australia and the outcomes and lessons learnt can be extremely useful as a reference to the UK. By learning from abroad and using overseas best practice developed over many years, the UK can develop a legacy of excellent urban landscapes that effectively manage their current urban water issues.

### Further information

For further information of CIRIA's involvement in managing water resources, please contact:

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## References

CLG (2008) *Code for Sustainable Homes*, Communities and Local Government, London. Go to:

[www.communities.gov.uk/publications/planningandbuilding/codesustainabilitystandards](http://www.communities.gov.uk/publications/planningandbuilding/codesustainabilitystandards)

CLG (2010) *Planning Policy Statement 25: Development and flood risk*, Communities and Local Government, London. Go to:

[www.communities.gov.uk/publications/planningandbuilding/pps25floodrisk](http://www.communities.gov.uk/publications/planningandbuilding/pps25floodrisk)

## Acts, Codes, Regulations & Standards

Floods and Water Management Act

2010. Go to: [www.opsi.gov.uk/acts/acts2010/pdf/ukpga\\_20100029\\_en.pdf](http://www.opsi.gov.uk/acts/acts2010/pdf/ukpga_20100029_en.pdf)

The Flood Risk Regulations 2009 (SI 3042) Water Framework Directive (WFD), Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

## Useful websites

A wealth of information is available on WSUD in Australia, and SuDS in the UK. The following links and references should be useful:

For information about:

WSUD, Healthy Waterways' water by design program: <http://waterbydesign.org.au/>

WSUD, the Sydney Catchment Management Authority: [www.wsud.org/](http://www.wsud.org/)

WSUD, Melbourne Water: <http://wsud.melbournewater.com.au/>

Hydrological modelling, the eWater Cooperative Research Centre: [www.ewater.com.au/](http://www.ewater.com.au/)

Australia's National Water Commission: [www.nwc.gov.au](http://www.nwc.gov.au)

SuDS, CIRIA: [www.ciria.com/suds/](http://www.ciria.com/suds/)

SuDS, Environment Agency: [www.environment-agency.gov.uk/business/sectors/36998.aspx](http://www.environment-agency.gov.uk/business/sectors/36998.aspx)

UK Building Regulations:

[www.communities.gov.uk/planningandbuilding/buildingregulations/](http://www.communities.gov.uk/planningandbuilding/buildingregulations/)