WATER SENSITIVE SA

WSUD at a range of scales to deliver multiple benefits

Mellissa Bradley, Program Manager

16th National Street Tree Symposium
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Water Sensitive SA - established to build the capacity of all organisations with a role in the planning, design, approval, construction or maintenance of new developments and infrastructure to implement best practice water sensitive urban design (WSUD)

We will bring about a cultural shift in which WSUD is widely recognised and embraced.

Water Sensitive SA Program Partners

WATER SENSITIVE SA

Natural Resources
Adelaide and Mt Lofty Ranges

LOCAL GOVERNMENT RESEARCH & DEVELOPMENT SCHEME

Government of South Australia

SA Water

City of Burnside

City of Port Adelaide Enfield

City of Salisbury

STORMWATER SOUTH AUSTRALIA

Local Government Association of South Australia

City of Charles Sturt

City of Playford

Australian Government | National Landcare Programme

EPA South Australia

City of Marion

Water sensitive communities

Bowden Urban Village

Old Port Road Source: City Charles Sturt

Hindley Street, Adelaide

30 Year Plan for Greater Adelaide

- 70% of new housing stock from infill development and
- remaining 30% from greenfield sites
- 258,000 net additional dwellings in Greater Adelaide (including Murray Bridge) by 2040.
- population increase of 560,000
- downward trend in median allotment sizes
  - 375 m2 in 2011-13 compared with
  - 520m2 2002-03 (UDIA, 2013)

Dana McCauley Stonnington Leader

Greenspace delivering multiple functions

Central Park, Medika Boulevard, Mansfield Park
Source: Port Adelaide Enfield Council

Dunstone Grove Reserve
Source: Baden Myers

Infill – Medium density - large scale

Infill – Medium Density

Lightsview

Infill – Medium Density

Infill – Road verge

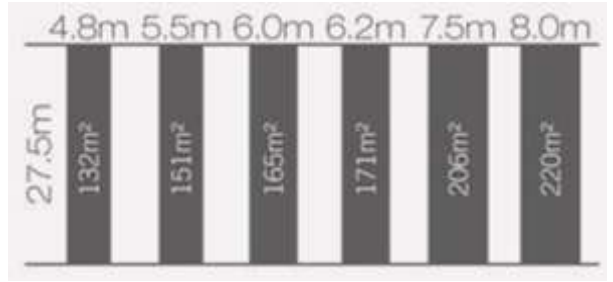
Infill – Road verge

Infill – alternative water for IPOS

Lightsview

Public open space and private homes (indoor and outdoor use) provided with treated stormwater from City of Salisbury

Medium Density – 3 stories or more



Source: www.lightsview.com.au

Retrofit - Streetscape

Randolf Ave, Fullarton Source: City of Unley

Retofit - Streetscape

The future green infrastructure?

Road reserves

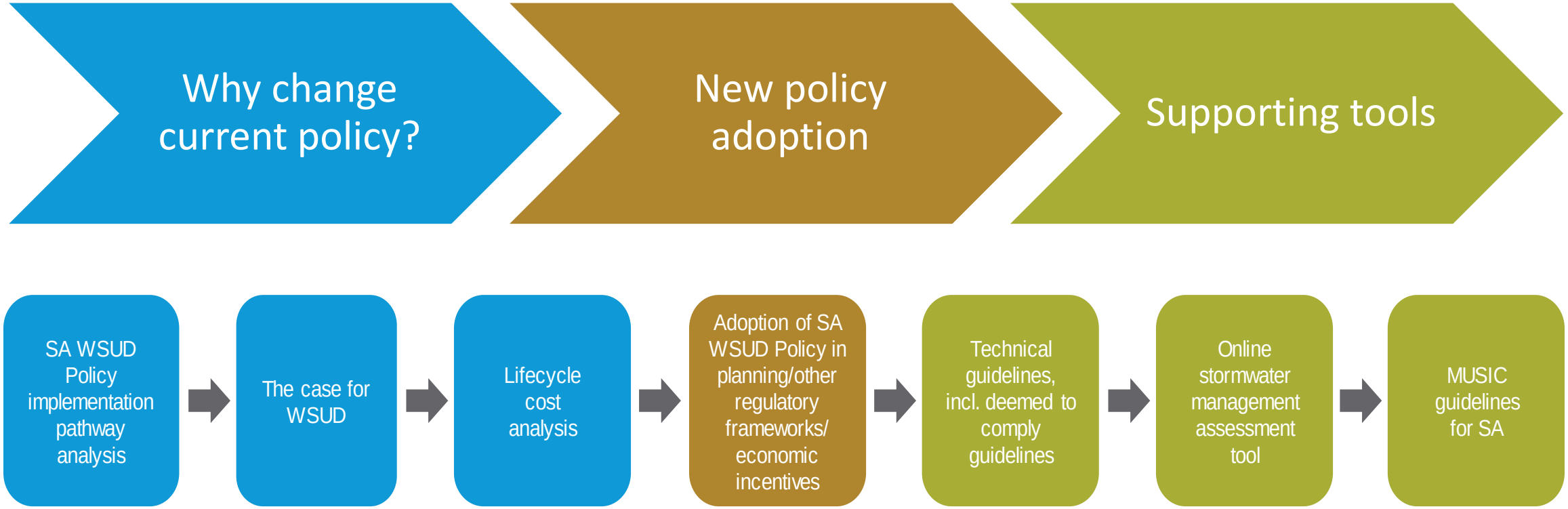
More than traffic calming……

Recycled water – beyond IPOS

Figure 7-3 Opportunities for Integrated Water Management - Goolwa

Integrated Water Management Plan - Goolwa and Hindmarsh Island

Bringing about change…



Stormwater Runoff Quality

45%
retention of typical annual urban load of total nitrogen.

60%
retention of typical annual urban load of total phosphorus.

80%
retention of typical annual urban load of suspended solids.

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Caltex, 734 Marion Rd, Marion Source: Baden Myers

Cooke Reserve, Royal Park. Source: City of Charles Sturt

Flood management

capacity of the existing drainage system is not exceeded.

no increase in the 5 year ARI peak flow compared to existing conditions.

no increase in flood risk for the 100 year ARI peak flow, compared to existing conditions.

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Bowden Urban Village

Source: Water Sensitive SA

Kirkcaldy Avenue, Grange

Source: Baden Myers

Private Space - Optimise multiple benefits

	Flood manage-ment	Water quality treatment	Green space for: ▪ Amenity ▪ urban cooling ▪ recreation	Water conserve.	Balance in the urban water cycle (infiltration to groundwater)
Detention tank	√				
Retention tank (indoor re-use)				√	
Reduced building footprint (2 storey)		√	√√√		√
Permeable pavements		√			√
Raingarden		√	√√		√

Infill – reduced dwelling footprint

Source: Tonkin Consulting

Reduced impervious footprint

Source: www.cocksauld.com.au

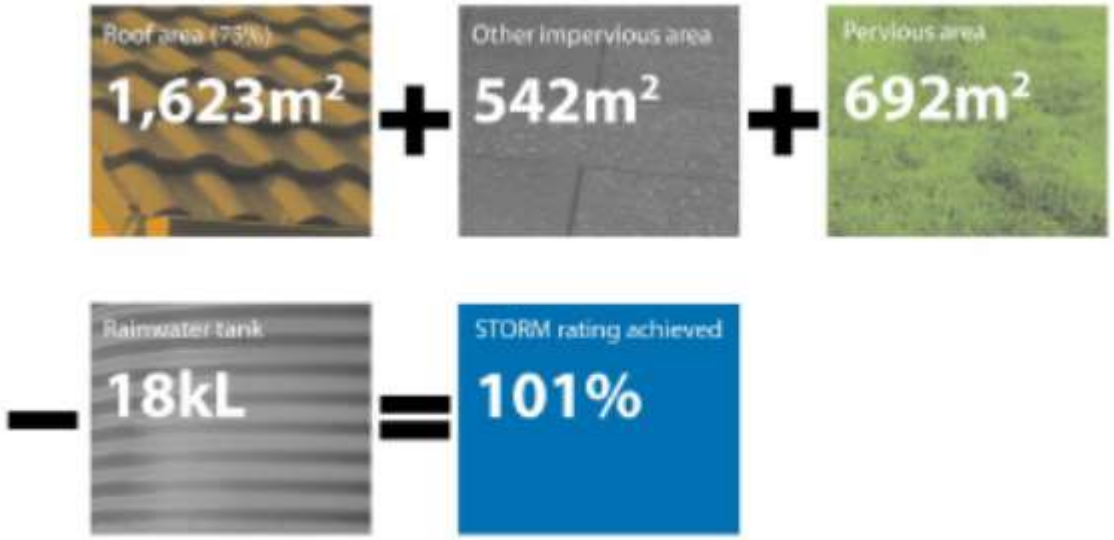
Infill - raingardens

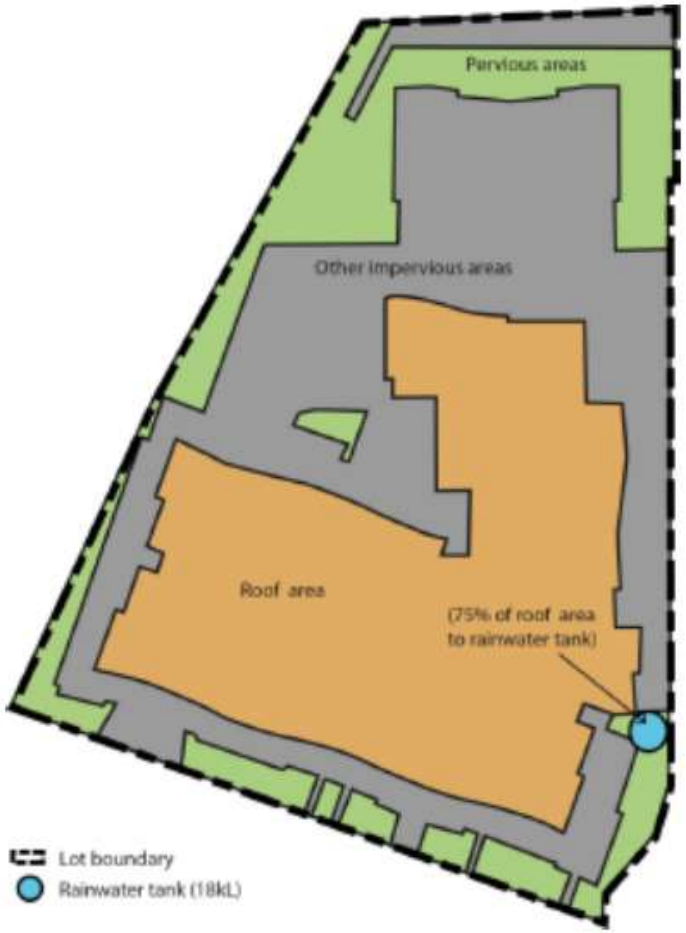
Infill - raingarden

Online stormwater assessment tool - for small scale / simple developments

Optimise solutions for site :

- Impervious area
- Rainwater storage (retention and re-use)
- Raingardens
- Permeable paving





Source: City of Mooney Valley

Tools to support transition to WSC

Cost Benefit Analysis

- Analysis Tool – Lot scale to catchment scale projects
- Literature review to establish metrics to inputs

Christie Walk Source: Baden Myers

Impact / Benefit - monetised

Western Sydney households willingness to contribute to recycled water schemes $0.45 - $1.22/kL.
Marsden Jacobs Associates (2007)

Abatement cost Total Suspended Solids removed via Swales $20 - $120 ($AUD 2010) / tonne of pollutant.
Hall (2012)

Abatement cost Total Nitrogen removed via WSUD bioretention $100,000 to $1,000,000 ($AUD2010) / tonne of pollutant. Hall (2012)

Air quality
Amenity
Biodiversity and Ecology
Building temperature
Carbon sequestration
Rain water harvesting
Enabling development
Flood risk
Groundwater recharge
Health
Pumping wastewater
Recreation
Treating wastewater
Water quality of receiving water
Crime
Economic growth
Education
Flexible infrastructure
Tourism
Traffic calming

Brisbane household willingness to pay for one % improvement in public parks and gardens that are green, $1.20/household
Marsden Jacobs Associates (2010)

5kL rainwater tank cost effectiveness - $2.29 and $5.47/kL for 200m2 and 50 m2 connected roof respectively
Marsden Jacobs Associates (2007)

Seagrass contribution to secondary production of SA fish Species $1,500 per hectare per year
McArthur, 2003 and McArthur and Boland 2006

Value Category	Monetised sub-impact	Present value	Level of confidence of the quantity calculated	Level of confidence of the monetary value selected/used	Present value after confidence adjustment
Amenity	Street improvements	$	0%	0%	$
	Permanent body of works	$	0%	0%	$
	Property increase	$	0%	0%	$
Building temperature	Green roofs	$	0%	0%	$
Carbon reduction	Reduced energy heating and cooling	$	0%	0%	$
	Reduced energy pumping	$	0%	0%	$
Flooding	Damage to property	$	0%	0%	$
	Loss of time	$	0%	0%	$
Health	Walking	$	0%	100%	$
	Cycling	$	0%	100%	$
	View of green space	$	0%	0%	$
	Access to permanent water	$	0%	0%	$
	Access to green space	$	0%	0%	$

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Cost Benefit Analysis Tool

Source: Adapted from www.ciria.org

The way forward

- Take advantage of every opportunity – new development, asset renewal and capital works
- Importance of multiple function community spaces
- Provide tools to analyse:

- Cost/benefits of WSUD projects
- The contribution of various WSUD elements to the overall performance relative to objectives

Bowden Urban Village. Photo: Water Sensitive SA

Franklin Street
Photo: City of Adelaide

www.watersensitivesa.com

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