Healthy Waterways

ONE CLEAR VISION

HEALTHY WATERWAYS **FOR A HEALTHY ECONOMY**

# WSUD capacity building and planning policy – can we have one without the other?

Andrew O'Neill, Exec. Manager – Water by Design

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Growing population*

***Demand for 740,000 new dwellings in the next 20 years in SEQ alone**

# What do we want to achieve?

***Intact natural habitats and the communities that use them***



***Waterways that have large economic value and are valued for that***



***Healthier communities that interact with waterways and are engaged with waterway protection***



# What does WSUD mean to Queenslanders

- For some = WSUD
- For many (most) = stormwater quality

# Regional partnerships



**Reef**
**Urban**
**Stormwater**
**Management**
**Improvement**
**Group**

**Healthy**
**Waterways**

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# Healthy Waterways

## Established

1995

## Vision

Healthy waterways for a healthy economy.

## Purpose

Understand and communicate the condition of the waterways to drive and influence future targets, policy and actions.

# Healthy Waterways members
























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# Ecosystem Health Monitoring Program

- Drove significant investment to reduce point source pollution (~$1b)
- Proven highly effective in achieving long term water quality improvements in South East Queensland estuaries
- Lowered nutrient loads (TN reduced by ~ 70% over 13 years)
- Reduced the incidence of algal blooms.

# Water by Design

**Established**
2005

**Purpose**
Increase institutional capacity to deliver sustainable urban water management practices.

# Water by Design

- Focus on stormwater, construction site and point source pollution
- Comprehensive guideline and training package
- Collaborative policy and project delivery
- Steering committee provides direction and funds projects

# Reef urban stormwater management improvement group

**Established**
2009

**Purpose**
To work together to increase adoption of industry best practice actions that are socially acceptable, financially responsible and environmentally appropriate

Image: Great Barrier Reef Marine Park Authority (Outlook report, 2014)

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# "RUSMIG" Members

















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# Reef Rescue

- The Australian Government's Reef Program funded collaborative projects with Water by Design & RUSMIG ($850k)
- Key outcomes:
  - Expand resources to coastal Qld from SEQ
  - 15 new or improved resources to support planning and on-ground implementation

# Why we work together...

- Use **existing partnerships** to collaborate locally, regionally and state-wide
- Help **reduce costs** in developing and implementing programs
- **Improve** individual programs through sharing, learning and collaboration
- Improve ability and capacity to leverage **funding**

# The 5 phases of Qld stormwater

1. Make them do it (Stormwater policy)
2. Show them how (Guidelines & training)
3. Make it happen (Implementation)
4. Check in (Review)
5. Refine (Adapt)

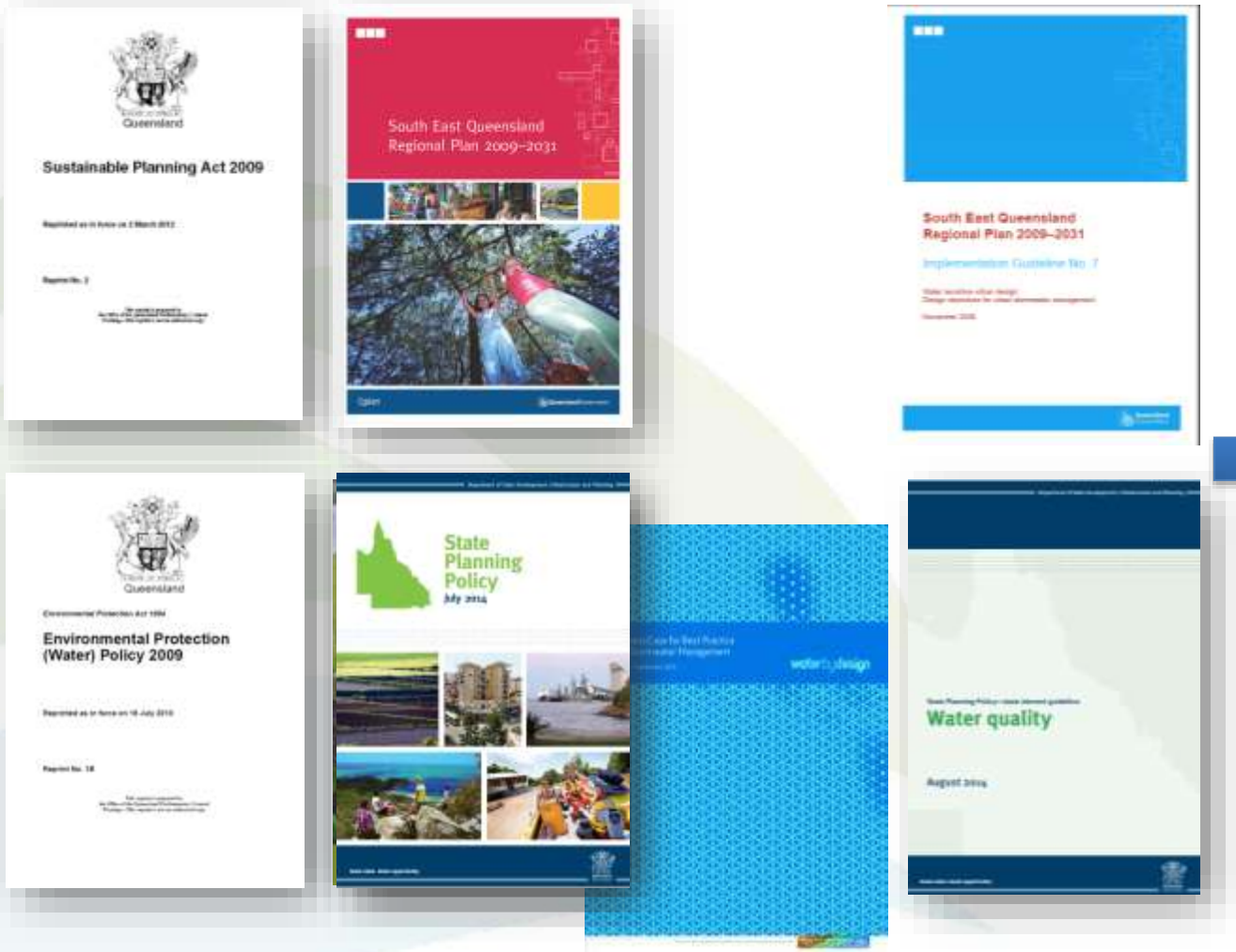
# Phase 1 (2005-2010):

## Stormwater Policy

"Everything we do in public policy prevents us from doing something else. **To govern is to choose.**"

*Richard Lamm*

# Statutory drivers for Stormwater management in Qld




Local government planning scheme policies, practice notes etc.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# Statutory drivers for Stormwater management in Qld

- Erosion and sediment control
- Quantitative stormwater objectives
  - Quality
  - Quantity



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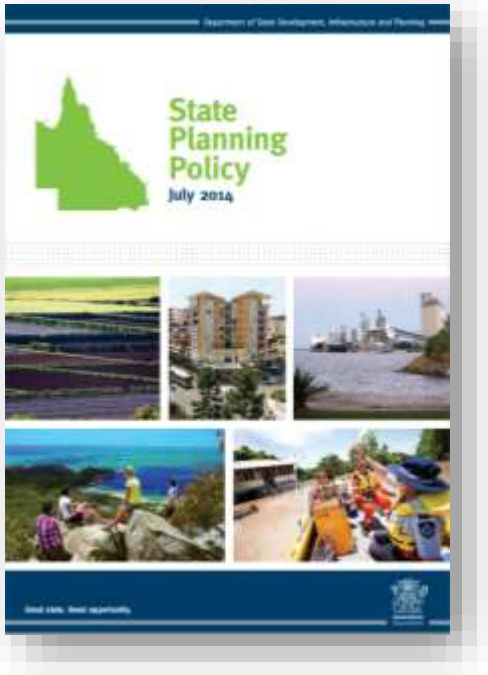
# Statutory drivers for Stormwater management in Qld

- **Waterway stability objective**
  - Preserve 1yr ARI flow rate / velocity in the waterway
- **Load reduction objectives**
  - Reduce annual pollutant loads by approx:
    - 80% for suspended solids
    - 60% for phosphorous
    - 45% for nitrogen

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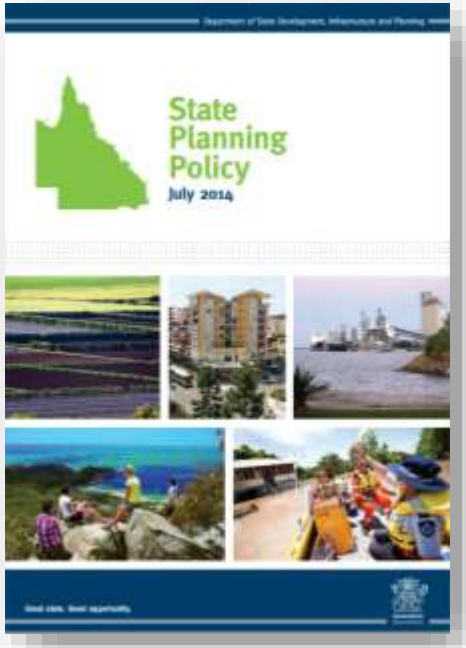
# Frequent Flow management objective

- Objective:
  - Capture first 15mm
  - “Remove” within 24 hours
- Issues:
  - Hard (expensive) to comply with
  - Evidence was mixed
  - Never applied
- Result: Removed from SPP (for now)

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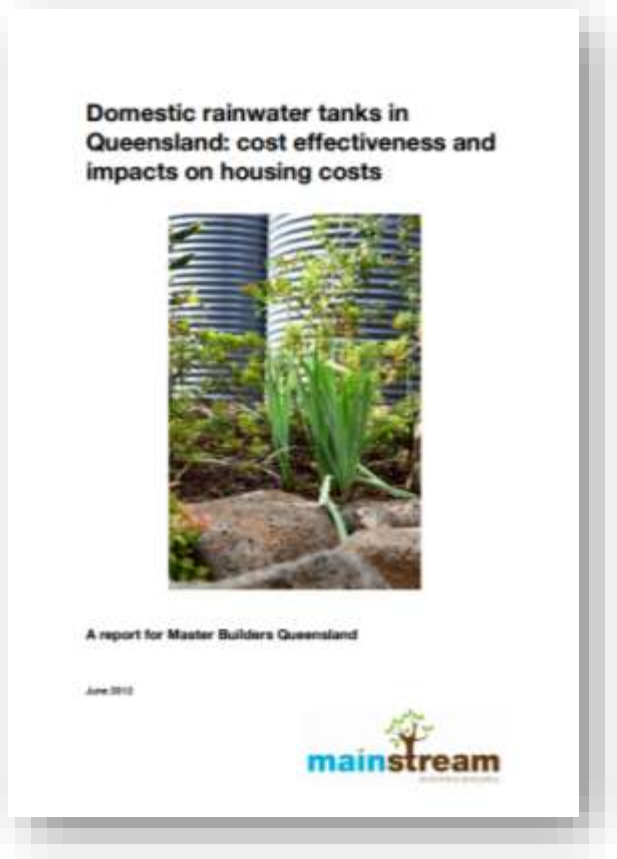
# Rainwater tank policy

- Queensland Development code
- Mandated ‘water savings’ (5 kL tank, 100 $m^2$ roof, connected to outdoor tap, laundry and toilet)
- Political pressure applied and now is no longer required

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# Early policy lessons

- Be ahead of messages that can offer government an ‘easy out’
- Have a strong evidence base for the things that are working
- Be prepared to drop things that are creating more issues than solving

# Phase 2 (2006 -2012):

Training and guidelines

"Efficiency is doing things right.
Effectiveness is doing the right things."

*Peter Drucker*

# DA process for stormwater

| | |
|---|---|
| Development Assessment | • Concept design and stormwater management plan |
| Design | • Detailed design drawings<br>• Operational works assessment |
| Construction | Signoff<br>Compliance assessment |
| Handover | • On and off maintenance inspections |
| Asset Management | • Maintenance<br>• Rectification |

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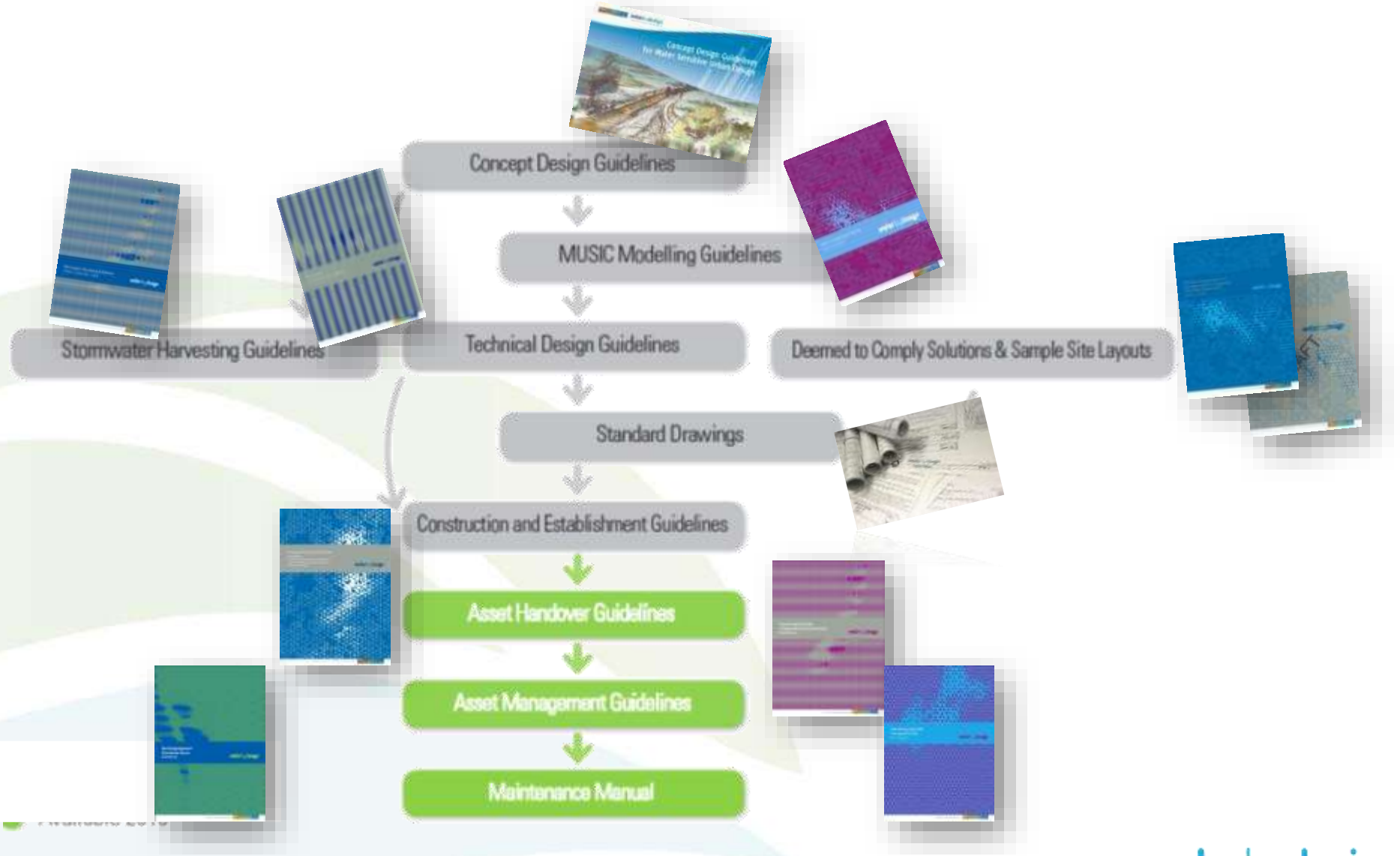
# Water by Design Guidelines and training

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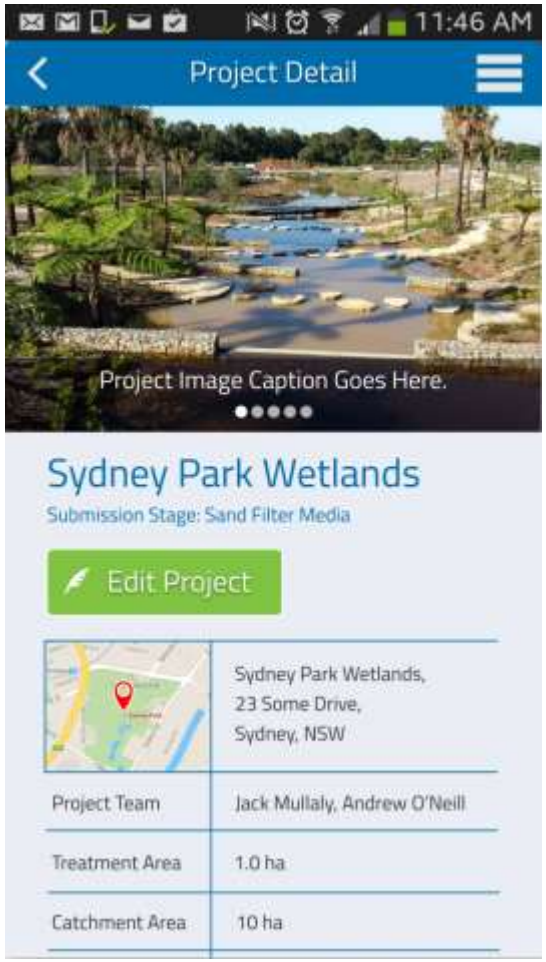
# Capacity Building

| | |
|---|---|
| Knowledge Building | • Research, discussion papers, ideas, innovation |
| Professional Development | • Guidelines and training |
| Organisational strengthening | Workshops, field days, institutional audit tools, listening, supporting champions |
| Directive reforms | • Policy, standards, codes |
| Facilitative reforms | • Incentives, frameworks, scoring systems, conferences, awards |

# Construction & maintenance

- Guidelines
- Training courses
- Now a mobile application
  - Checklists
  - Step-by-step guides
  - Suppliers
  - Videos
  - Project management
  - Plant lists




http://www.waterbydesign.com.au/ceguide
http://fieldguide.waterbydesign.com.au

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# Early capacity building lessons

- Pretty easy to improve technical capacity
- Less prescriptive is better
- Need to understand relationships, workloads and processes better
- The process is linear – how can we work with it?
- Institutional capacity takes the most effort to shift (time, workshops, phone calls, cups of coffee etc)

# Phase 3 (2007 -present):

Implement

"Strategy is really simple. You pick a general direction and **implement like hell.**"

*Jack Welch*

# What is the policy driving?

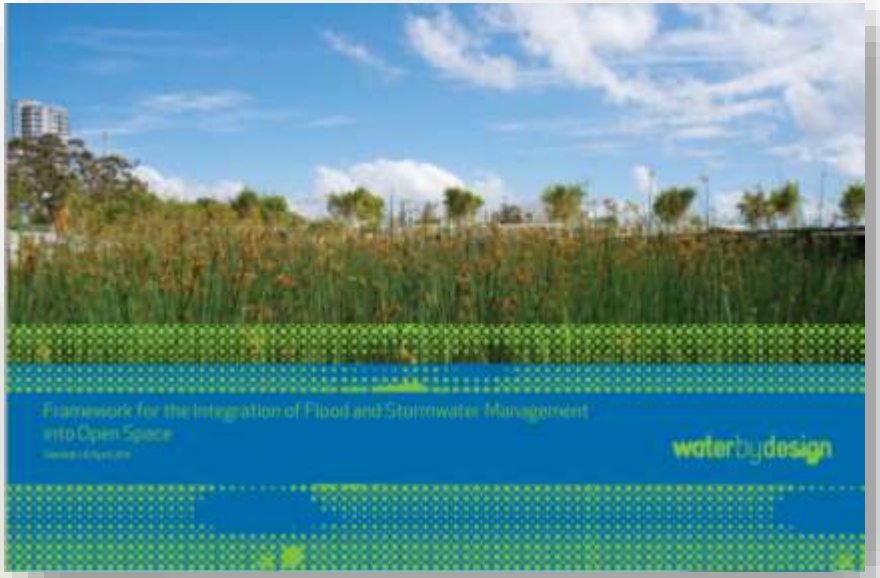
- Lots of infrastructure to achieve **compliance** with targets (90-95% Bioretention)
- We also see some wetlands, tanks, swales
- Typically good results on larger developments, poorer (less integrated) outcomes on smaller sites

# Implementation at scales

| Lot | Infill | Neighbourhood |
|---|---|---|
| Small bioretention on the street, or in commercial/industrial | Small bioretention instead of a lot, with OSD | Varied – typically a large end-of-pipe bioretention |
| Proprietary devices | Small streetscape systems | Small streetscape systems |
| No tanks or infiltration, sometimes nothing | Sometimes nothing – driver for 'offsets' | Occasionally integrated with parks |

# The stormwater / park combo

- It's a great idea!
  - Meaningful – "placemaking"
  - Diversity
  - Social
  - Sustainable
  - Connected
  - Safe
  - Saves space
  - Saves money
  - Reduces maintenance

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Fitzgibbon Chase, Urban Land Development Authority

# Public open space & WSUD

- Who wants it?
  - Not parks people
  - Not maintenance
  - Not drainage / engineering
  - Not developers (unless they get credit)
- Not a technical problem
- It's about credit and maintenance (finding a group in council who'll look after it)
- Now being integrated into policy

# Implementation lessons

- Consistent, quantitative policy drives uptake by councils
- Design and construction goes quickly when people are motivated (approvals)
- The objectives / MUSIC modelling drive bioretention
- Knowing how is not enough to get good results
- We did not focus enough on ESC, parks, roads, maintenance, community early on

# Phase 4 (2013 onwards):

Review

"However beautiful the strategy, **you should occasionally look at the results**."

*Winston Churchill*


Lack of integration
Lack of clearer broader objectives for assessment teams
Frustration for maintenance teams
Missing the multiple benefits to the community
“It costs too much”
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# Drivers

- Political pressure:
  - Perceived impact on housing costs
  - Contested space (parks, lots, streets)
  - Increasing maintenance costs for councils
- Community pressure:
  - Complaints about unsightly / unsafe basins and street systems


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# Development assessment process reform

- Review of Operational works & large subdivisions – DAPR OWLS
- Findings from 1000 DAs in Qld
  - 30% of RFIs relate to stormwater
  - Open space integration is difficult
  - Perception that 10% yield "lost" to stormwater
- Lead to a QCA review of 'the cost of WSUD'
  - Found costs were <1% of a house
  - Consistent with the Business Case (benefits 3x the cost)

Council of Mayors
South East Queensland

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# A bit about maintenance

Sourced from
http://verdaus.com/blog/rain-gardens-of-isfahan/

**Andrew Kable** on **27/06/2011 at 7:33 am** said:

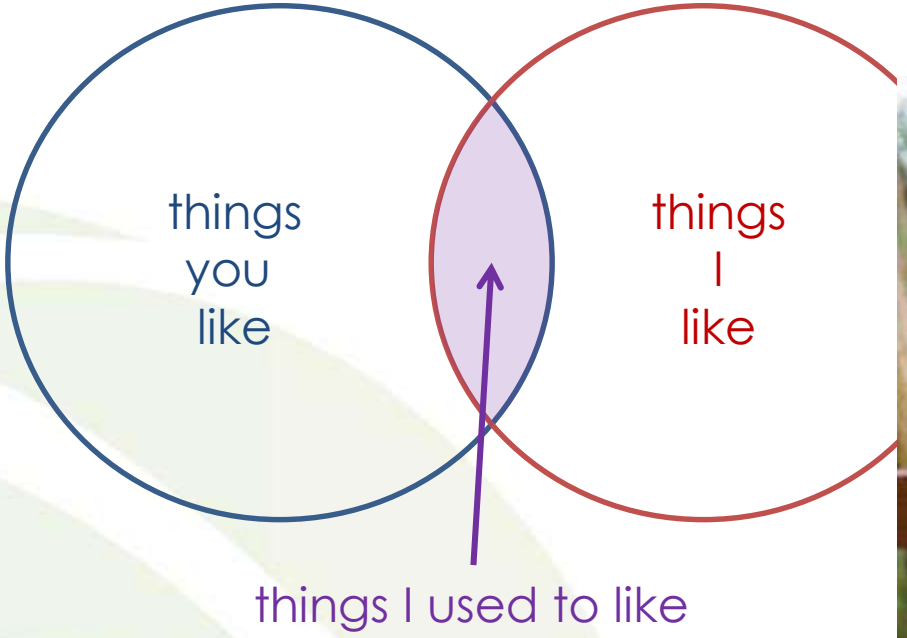
Laith,

Does the municipal authority have a special team to maintain the rain gardens? Or is it their parks people…

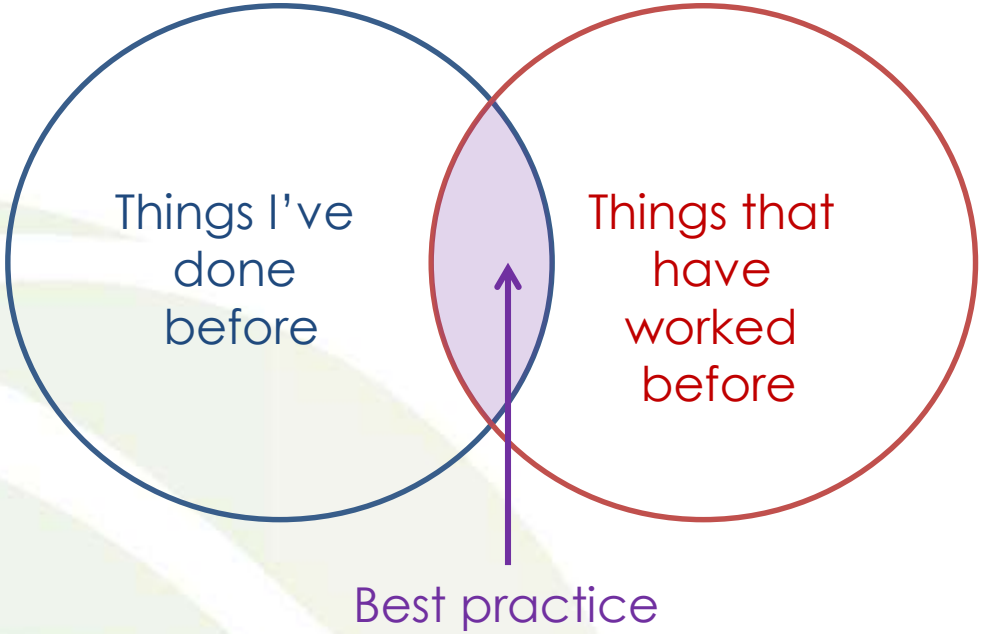
Laith Wark on **27/06/2011 at 8:37 am** said:

Andrew. Good question – maintenance is the key. I observed municipality staff removing trash from the rain gardens. However maintaning and monitoring the irrigation part may be a speacial department. I would need to research this to find out what would be the maintaince resposibilities. Also it is not clear what the maintenance regime is. However it appears to have worked for the last 400 years or so. I would be interested to know what level of pollutants would be in the soil after all this time and whether it is a problem. Your question raises a very good point and I am interested to find out more, perhaps on my next visit to Isfahan, or via a contact there. Will let you know if I find out. (PS. Saw your post on China and treatment at point of use, very interesting and insightful.)

# About hipsters




# Best practice




Things we have
done before
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# What we used to do before "WSUD"

- We took contributions and attempted to deliver regional stormwater solutions but it was hard to:
  - plan projects
  - secure funds
  - locate sites
  - monitor
  - deal with lag
  - be additional
  - demonstrate equivalence and additionality

Sourced from IFC.com

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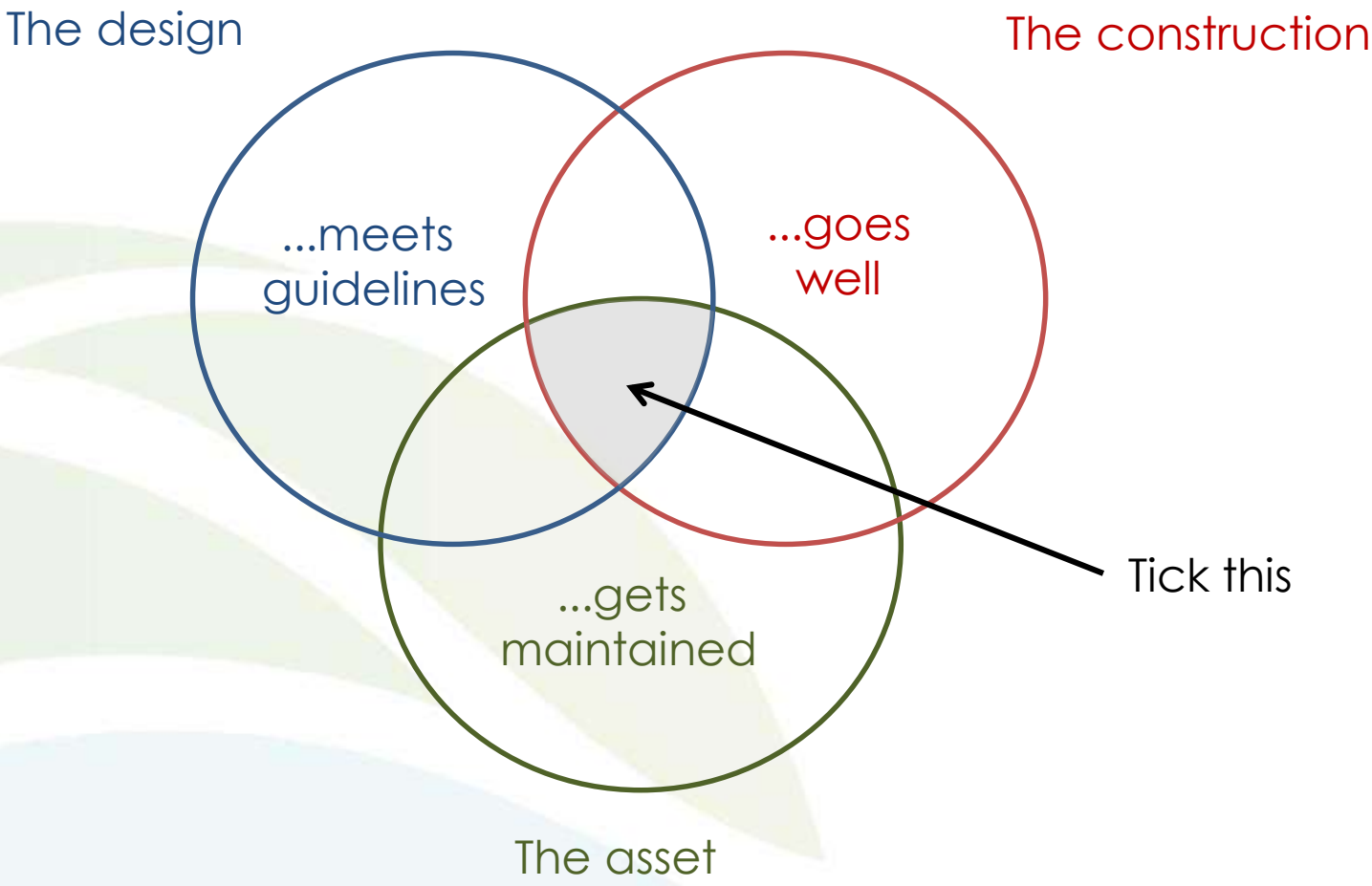
# Best practice stormwater?

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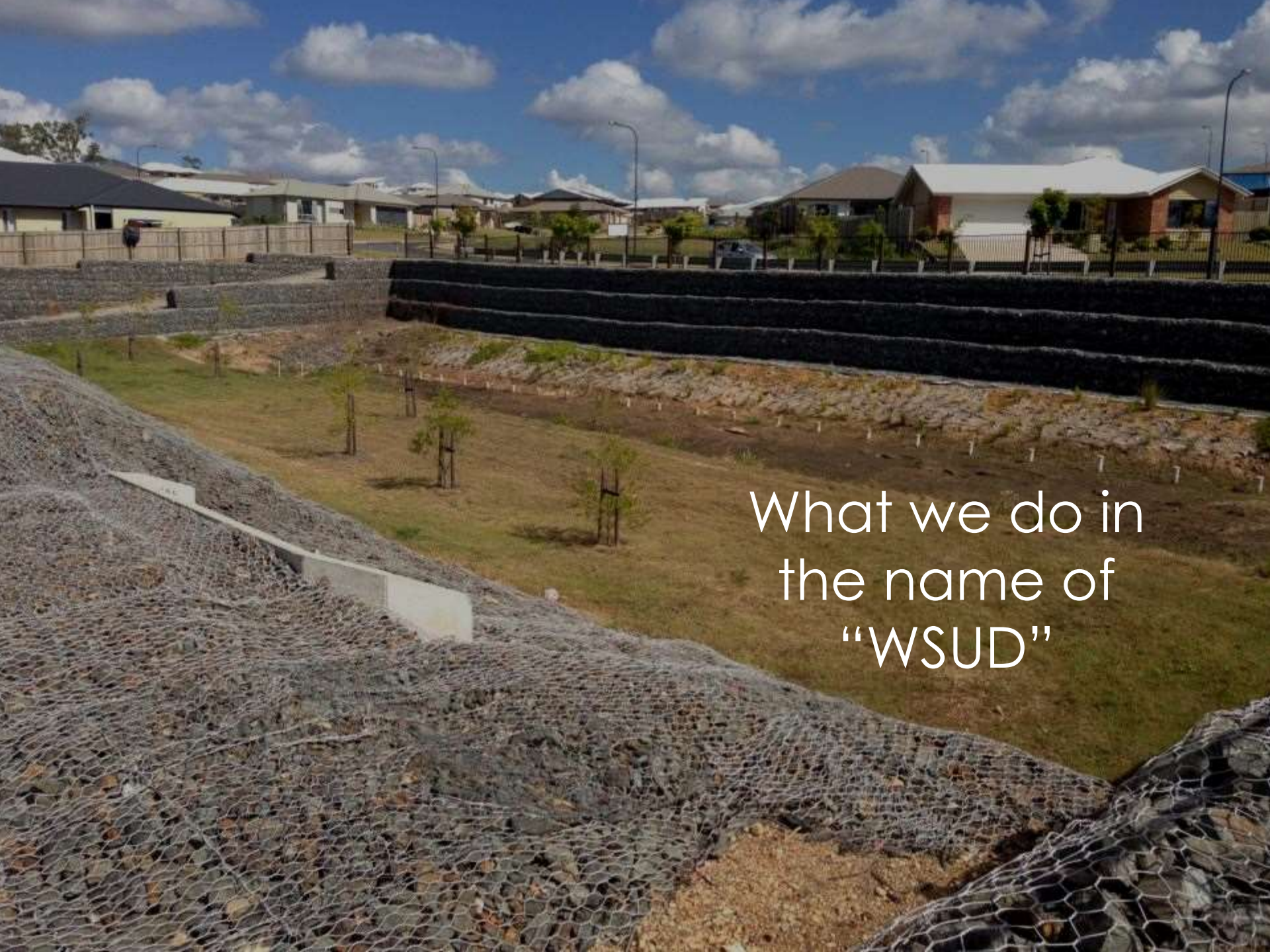
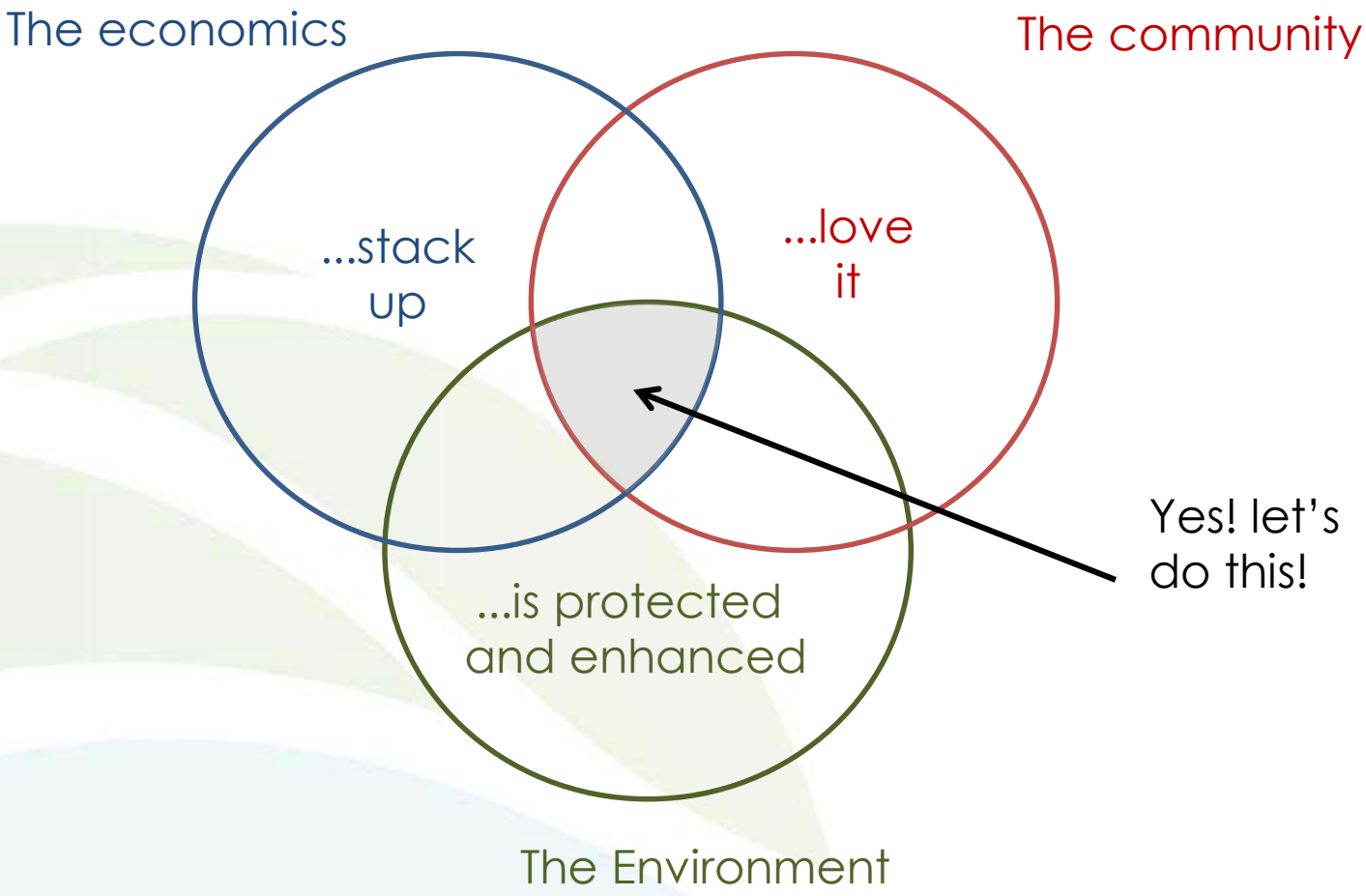
Design


What we do in
the name of
“WSUD”


What we do in
the name of
“WSUD”

# What do we want?

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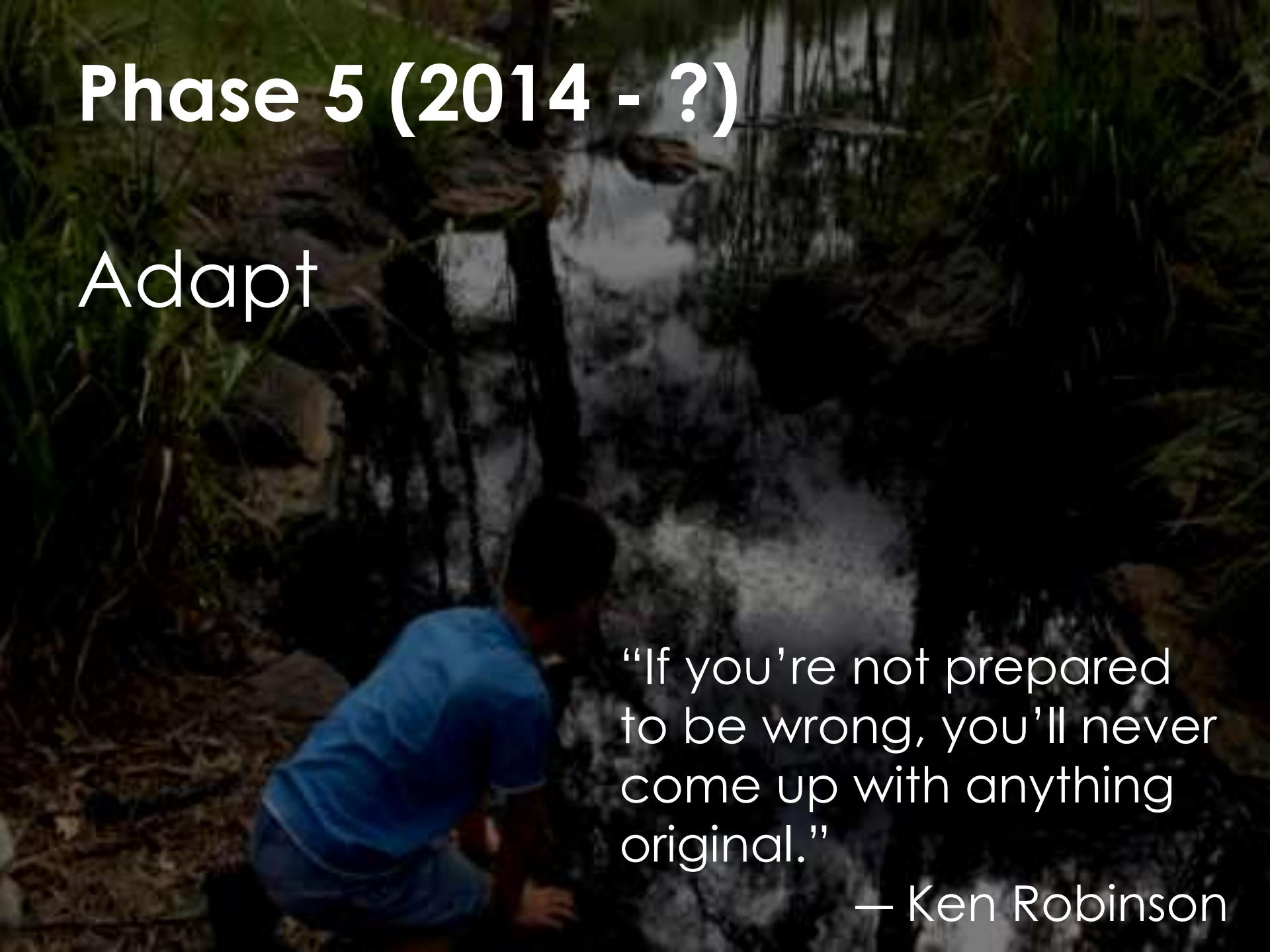
# Implementation lessons

- Compliance with water quality standards sole driver for "WSUD" in Qld
- Broader thinking on our purpose / objectives is needed
- Collaboration needs to be prioritised
- Our guidelines have become standards

# Phase 5 (2014 - ?)

Adapt

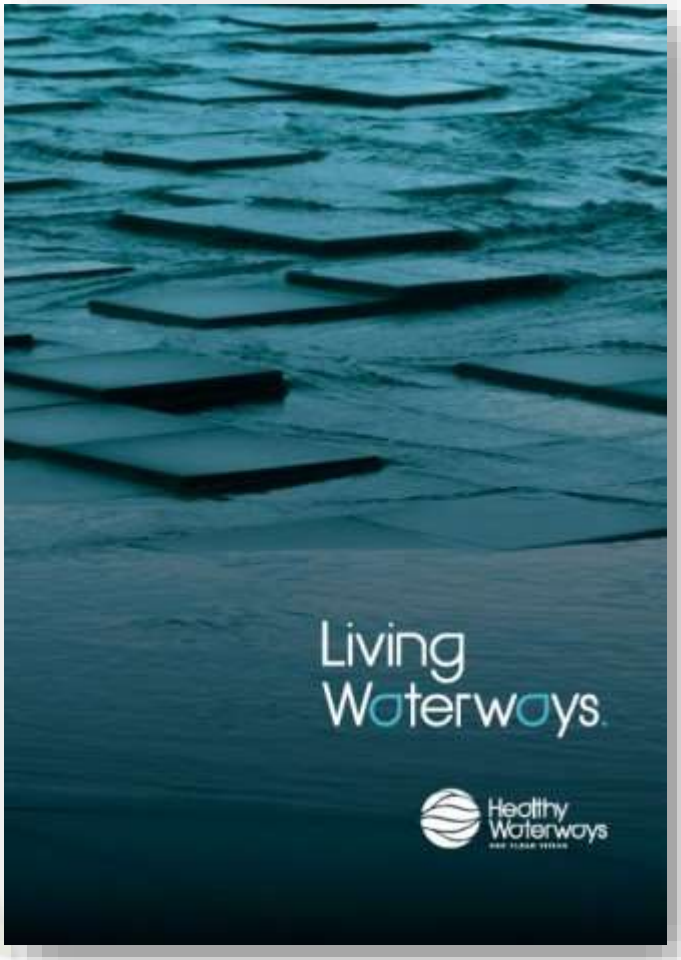


"If you're not prepared to be wrong, you'll never come up with anything original."

— Ken Robinson

# More flexibility "on site"

- Broader objectives
- Better stormwater management that drive innovative approaches
- Flexible options and incentives to achieve them
- Now being integrated into policy




http://waterbydesign.com.au/living-waterways

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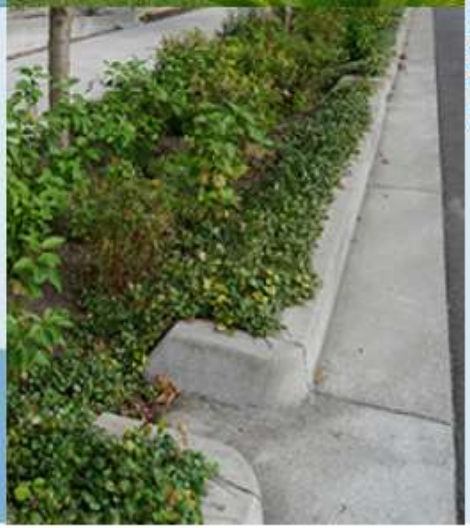
LIVING WATERS
Protect and enhance our water systems and their environments

## LW5 *Stormwater that is managed at source*

| REFERENCE | DESIRED OUTCOMES | NOTES ON PROVISION OF REQUIREMENTS | VISUAL EXAMPLES | IMAGE DETAILS | POINTS AVAILABLE | POINTS ACHIEVED | HOW DOES THE SITE DESIGN ACHIEVE THIS OUTCOME | DOCUMENT TITLE AND REVISION IF APPLICABLE | NAME OF REPORT AND RESPONSIBLE PARTY |
|---|---|---|---|---|---|---|---|---|---|
| LW5.1 | **IMPERVIOUS SURFACES ARE ENCOURAGED**<br>This desired outcome applies to 'surfaces' on a site and acknowledges that impervious surfaces should be minimised through the following practices:<br>- Maximising the extent of permeable soils;<br>- Minimising slab-on-ground construction;<br>- Using permeable pavements where appropriate;<br>- Using green roofs;<br>- Avoiding direct drainage from impervious surfaces to stormwater drainage systems and waterways<br>**Compliance**<br>Compliance with this desired outcome can be demonstrated by the submission of a report by a RPEQ demonstrating compliance with the above, and the basis for the design, implementation Such reporting can form part of a Stormwater Management Plan (SMP. A Stormwater Management Plan is required to includes the calculations and the points allocated for the proposed development.<br>**POINTS CAN BE ACHIEVED AS FOLLOWS:**<br>**8 POINTS = < THAN 5% EFFECTIVE IMPERVIOUS SURFACES**<br>**6 POINTS = < THAN10% EFFECTIVE IMPERVIOUS SURFACES**<br>**4 POINTS = < THAN 15% EFFECTIVE IMPERVIOUS SURFACES**<br>**2 POINTS = < THAN 20% EFFECTIVE IMPERVIOUS SURFACES**<br>**NO POINTS ARE EARNED IF EFFECTIVE IMPERVIOUS SURFACES ARE 30% OR MORE ON A SITE.** | The aim of this desired outcome is to limit the opportunity for runoff flows that occur over imprevious surfaces (such as parking lots, building rooftops, external hardscape areas). Limiting flows reduces opportunites for the accumulation of debris, sediments and othe pollutants that can adversely affect receiving waters.<br>**Definition:**<br>*See definition list for definition of "Surface"* |  <br>  | *Olympic Park, Sydney-Pedestrian surface paved in decomposed granite, with timber pedestrian path.*<br>*Image credit: Amalia Wright*<br>*Parque del Agua, Bucaramanga: Proprietary permeable pavement system with small established infill vegetation.*<br>*Image credit: Amalia Wright* | 10 | 8 | text response over multiple lines. Checking that you can also copy and paste internally and from other documents - does it auto turn? YES | | |
| LW5.2 | **RUNOFF POLLUTION IS MINIMISED**<br>This desired outcome applies to any proposed treatment system.<br>Stormwater pollution is avoided by local management and the design of sustainable intercepting and treatment environments between the site and receiving waters<br>**Compliance**<br>Compliance with this desired outcome can be demonstrated by the submission of a report by a RPEQ demonstrating compliance with the above, Such reporting can form part of a Stormwater Management Plan (SMP). A Stormwater Management Plan is required to includes the pollutant load calculations and the points allocated for the proposed development.<br>**POINTS CAN BE ACHIEVED BY MEETING THE FOLLOWING STORMWATER POLLUTANT LOADS FOR TSS, TP AND TN) AS A FOLLOWS:**<br>**8 POINTS = POLLUTANT LOADS ARE 25% BELOW TARGET LOADS**<br>**6 POINTS = STORMWATER LOADS MEET TARGET LOADS**<br>**4 POINTS = POLLUTANT LOADS 25% ABOVE TARGET**<br>**2 POINTS = POLLUTANT LOADS 50% ABOVE TARGET**<br>**NO POINTS ARE ALLOCATED WHERE POLLUTANT LOADS ARE MORE THAN 75% ABOVE THE TARGET LOADS.** | The aim of this desired outcome is to encourage the consideration of localised pollutants capture and treatment methods that prevent downstream impacts.<br>Local site maintenance and management acitivities should be considered as one of the first lines of defence against healthy waterway goals. |  | *Portland: storm water is intercepted in bioretention gardens.*<br>*Image credit: Amalia Wright* | 10 | 7 | text response over multiple lines. Checking that you can also copy and paste internally and from other documents - does it auto turn? YES | | |

# How can we benefit?

- Planners and designers in DA and industry
- Potential for:
  - Streamlined approvals and reduced timeframes for exemplar development proposals
  - Reduced assessment workload
  - projects that achieve a higher standard of development with lower ongoing maintenance costs

# Less prescriptive

- Small improvements
- Ideas
- Sketches


http://waterbydesign.com.au/water-sensitive-designs/

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# Tree Pit

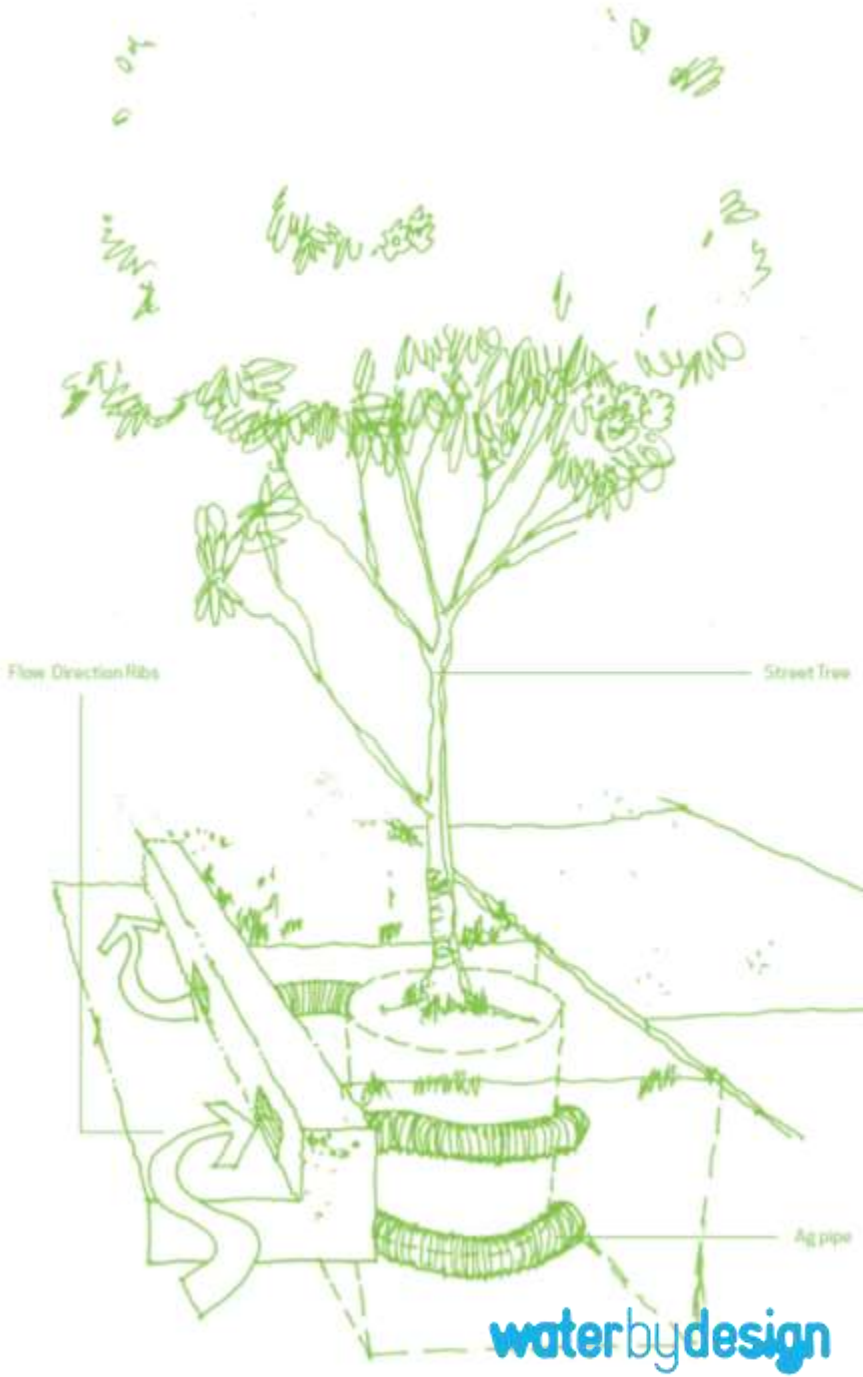
**application:** street-scape systems

**advantage**

- promotes infiltration
- stormwater treatment
- economical to build
- improve tree growth/shade

**note:** this can be modelled in MUSIC using a bioratention node with low hydraulic conductivity and extended detention depth

Infiltration | Water Quality | Resource Efficient | Microclimate

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# More flexibility "off site"

- We find WSUD hard
- Manage stormwater off site
  - Hard to deliver
  - Objectives-dependent
  - Can be a serious cost shift
- Now being integrated into policy


http://waterbydesign.com.au/stormwater-discussion-paper

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# Current projects

- Erosion and sediment control
- Update to Queensland stormwater policy
- Wetland design technical guidelines
- Waterway management guidelines
- Partnership with industry and councils to deliver community capacity building workshops

# State funded ESC project

- Erosion & Sediment Control (ESC) Compliance Capacity Building Project funded by EHP ($950k over 3 years)
- Delivers:
  - Business case for improved ESC compliance – increased understanding by all stakeholders about the true costs of sediment; who pays
  - Supporting materials for LGAs and industry to improve capacity to cost-effectively manage ESC
  - Improved consistency and performance standards
  - Engagement with key industry stakeholders to improve ESC awareness & industry support for improved land development practices

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# New policy

- Currently working with the Departments of Infrastructure, Local Government and Planning (DILGP) and Environment and Heritage Protection (DEHP)
- Stormwater policy update to achieve:
  - New design objectives (reflect changes in MUSIC)
  - More flexibility (to reduce costs and improve environmental outcomes)

# In summary…

- We're doing a lot of things really well
- Be prepared (Important to do mythbusting)
- Address the drivers rather than knee-jerk
- Political will through community and economics
- Good projects = champion + collaboration (can incentivise)
- Leading with good ideas can drive change
- Meaningful partnerships create a better, safer base – security of funding and stable platform for change management