Cities and spaces – integrating roads, water and trees

Harry Virahsawmy
Harry.virahsawmy@alluvium.com.au
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Store water in gravel trenches and surrounding soil to be used by trees

Typical design
- 0.6 m deep
- 2.0 m wide
- 3.0 long
- Filled with gravel
- Water slowly seeps out

Livesley, Stephen
University of Melbourne
Vision

Large scale Implementation

Benefits

Need to overcome
• Technical challenges
• Institutional barriers
Stakeholders

Just a short list of stakeholders....

• Road designers/engineers
• Water engineers/scientist
• Geotech
• Landscape managers/architects
• Arborists
• Planners
• Utilities providers
Road design

- Transport
  - Convenience
  - Efficiency

- Landscape
  - Aesthetics

- Drainage
  - Minor drainage
  - Major drainage

- Access
- Safety
- Construction and maintenance cost
Cross section

- Footpath 1.5
- Infiltration trench 1.0
- Nature strip 2.8
- Road
- Tree 1.0

- Inspection opening
- 150 top soil and seed
- 100 Ø UPVC slotted pipe

- FTTH 0.275
- Gas 0.75
- Recycled water 1.2
- Potable water 1.7

- 100 Ø ductile iron pipe or 100 Ø UPVC pipe Class SH

- Subsurface drain 100 Ø perforated PVC agricultural pipe
  (Note: transition 100 Ø perforated pipe to a solid 100 Ø pipe through the opening of the pit)

- 300 mm Ø Stormwater street drain (indicative only)
Infiltration trench  
*Robust but cost more*

Landscape depression  
*Cheaper but can impact on other uses*
Summary

• What we know

  – For large scale implementation
    • Need stakeholders to start having the right conversations
    • Need a multi-disciplinary approach to solve technical challenges and institutional barriers

  – Robust passive irrigation systems exist for integrated road design and cost benefit can be favourable
New set of guidelines

How will it help?

- Planning – urban design/controls (e.g. road layout and width, width of nature strips)
- Pavement design
- Type of passive irrigation system (robust or simpler design)
- Location and access to underground services
- Tree proximity to passive irrigation system
- Design details for different climate and soil conditions
- Design details for established and new roads
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New initiative

Objectives
• Making on-ground implementation possible
• Developing actual guidelines that engineers and planners can use every day
Stakeholders

• Local Government:
  – Local champions
  – Road engineers
  – Open space/landscape
  – Arborists etc..

• Consultants:
  – Landscape architects
  – Geotechnical and Civil Engineers
  – Water and environmental engineers

• Water Agency:
  – Melbourne Water

• Government Agencies:
  – VicRoads
  – MPA

• Associations:
  – Australian Asphalt Pavement Association
  – Water Services Association of Australia
  – Australian Road Research Board

• Clearwater
What we will do?

- Literature review
- Practitioners survey/workshops
- Case studies: good and bad
- Design options and guidelines
- Industry review
- Design and guidelines updates
- Roadshow
- Industry adoption process
Get onboard

- The challenge of bringing ‘US’ together
- Talking to the right people in the right way with a multi disciplinary focus
- Stormwater management for future generation
We are passionate about the protection and restoration of waterways, catchments and water resources. We strive to make a positive difference to the world we live in.