Maryborough Integrated Water Management Plan

Delivering real community benefits through the water cycle

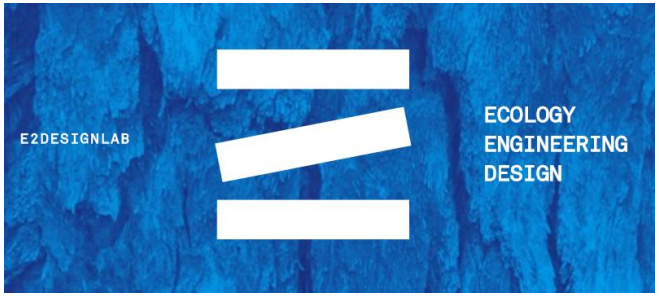
Project Partners

CENTRAL HIGHLANDS WATER

CENTRAL GOLDFIELDS SHIRE COUNCIL

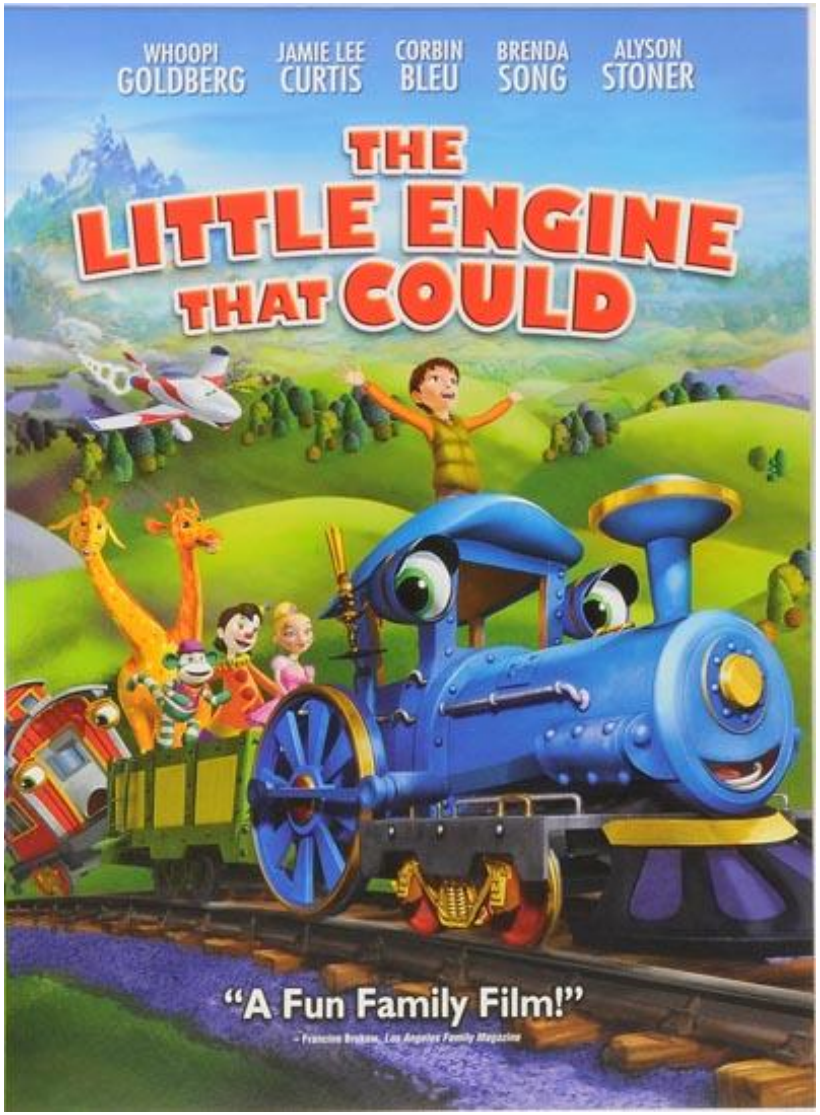
NORTH CENTRAL Catchment Management Authority

Project Team



RMCG

The little town that could….?



Key IWM Driver

Learning as we grow

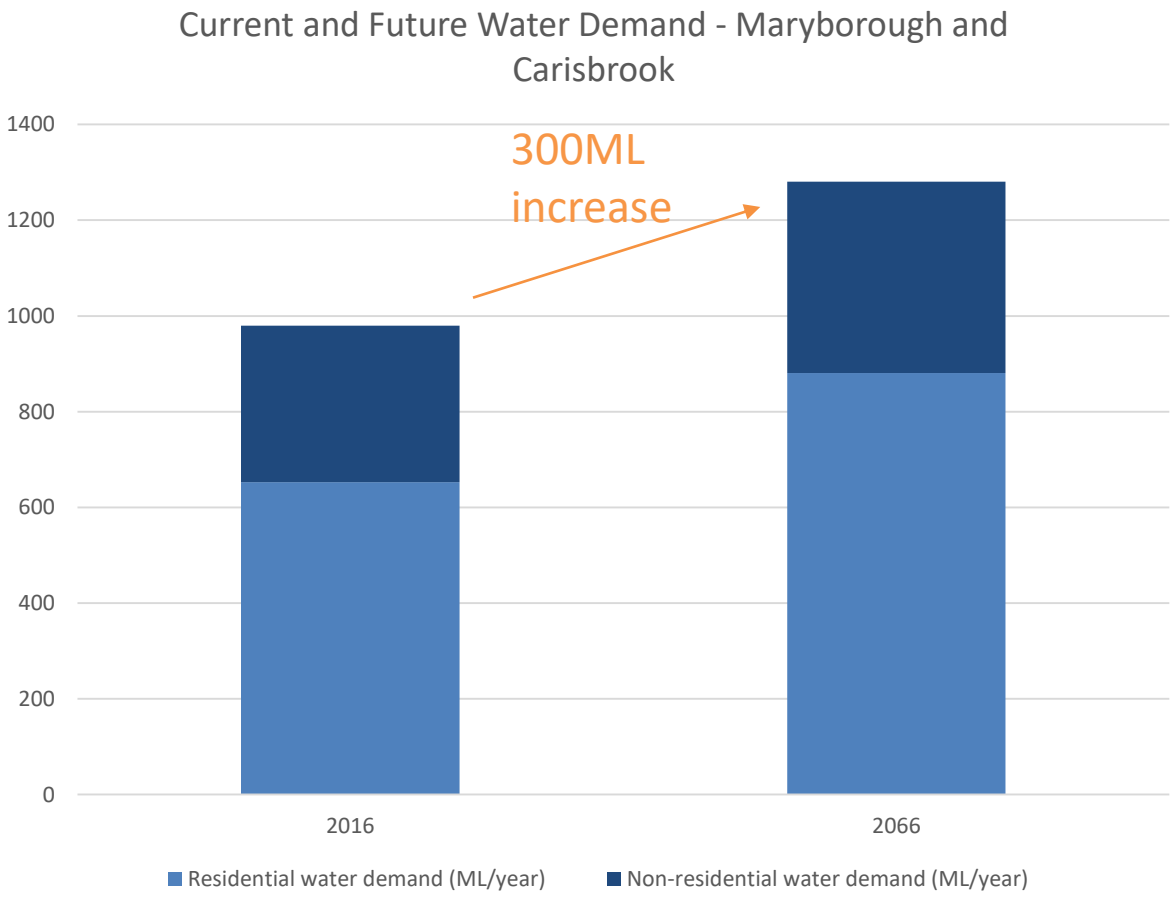
Modest growth

~1500 new homes expected in plan period (to 2065)

Important opportunity to drive better outcomes

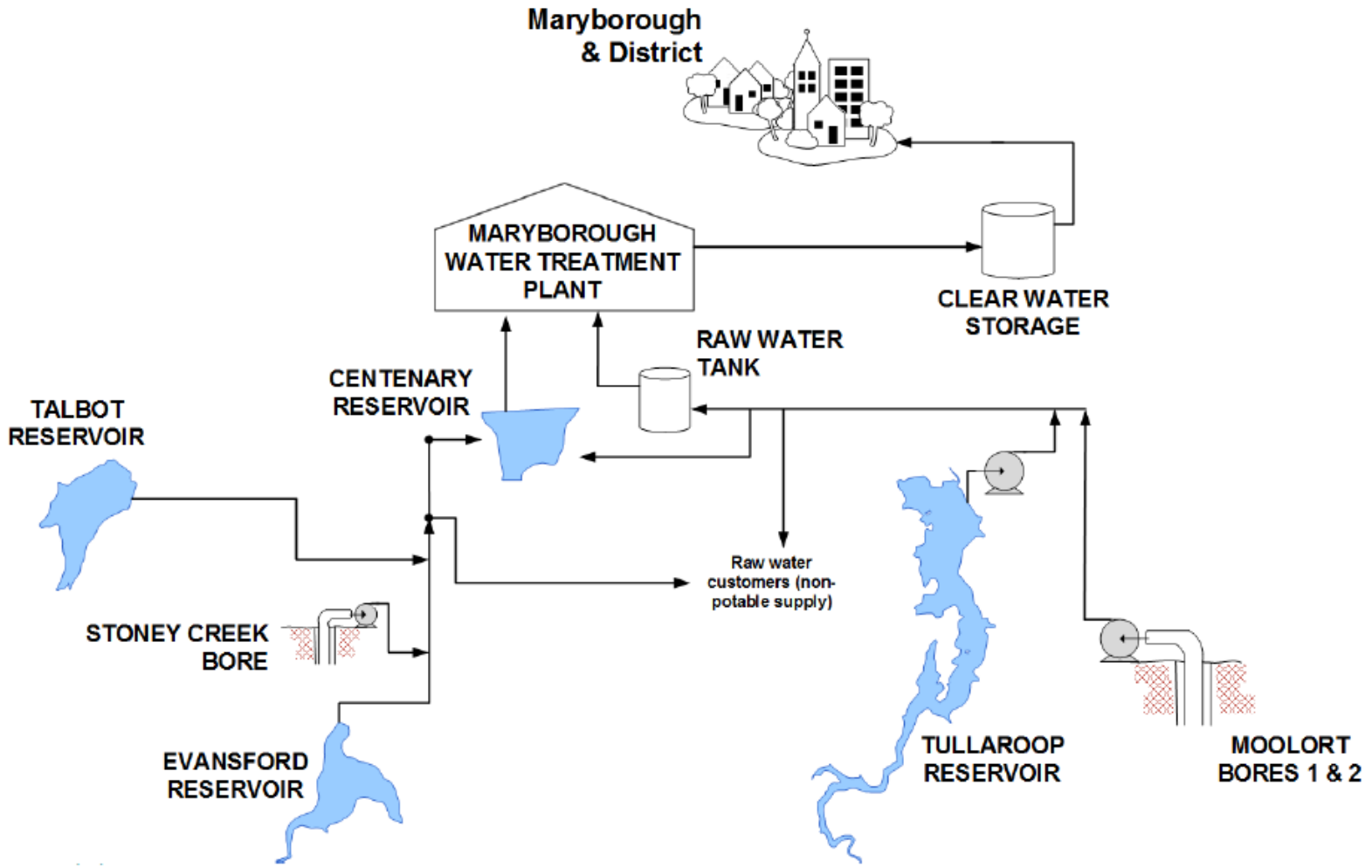
Key IWM Driver

Securing water for the future



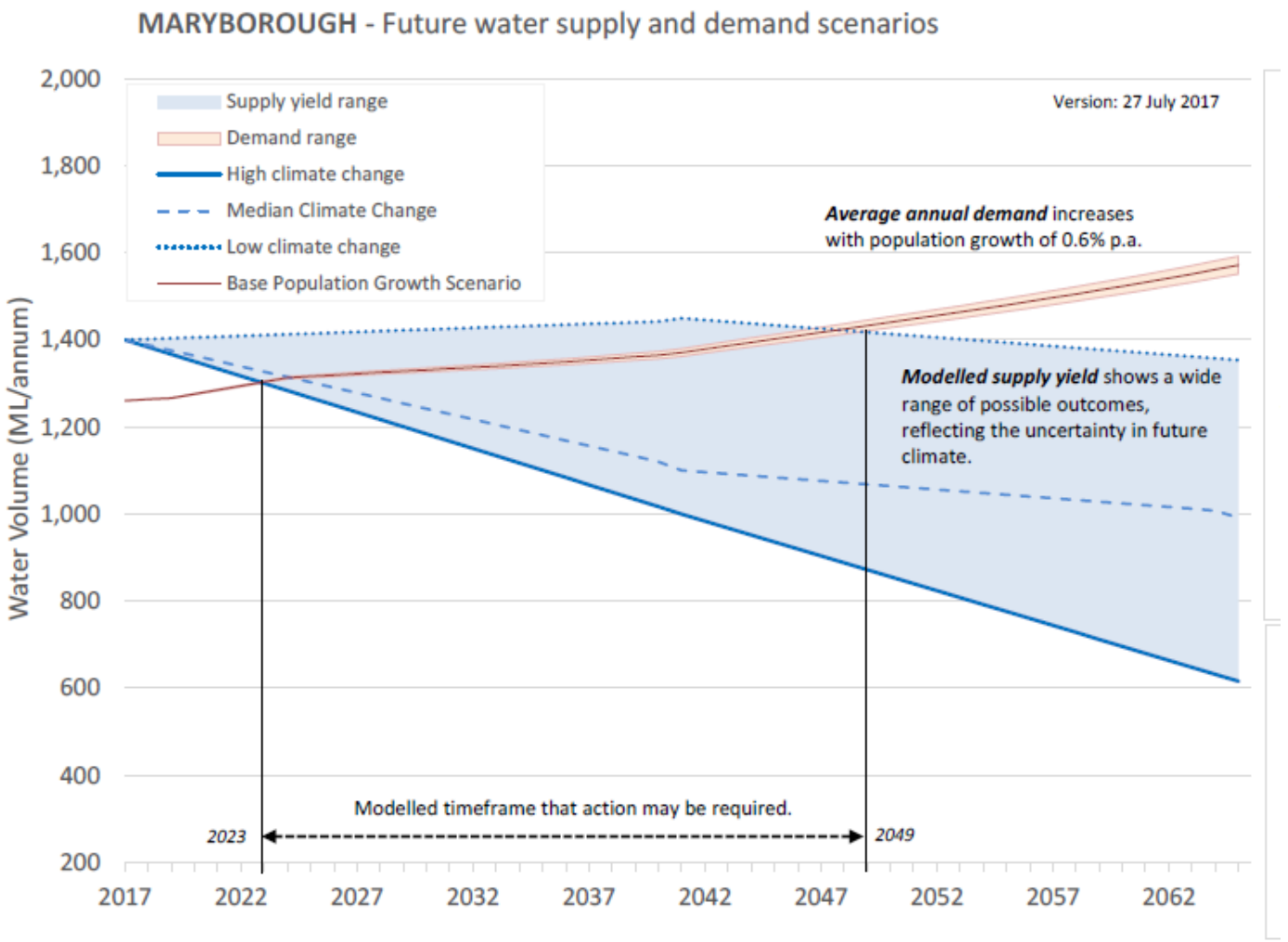
Key IWM Driver

Securing water for the future



Key IWM Driver

Securing water for the future

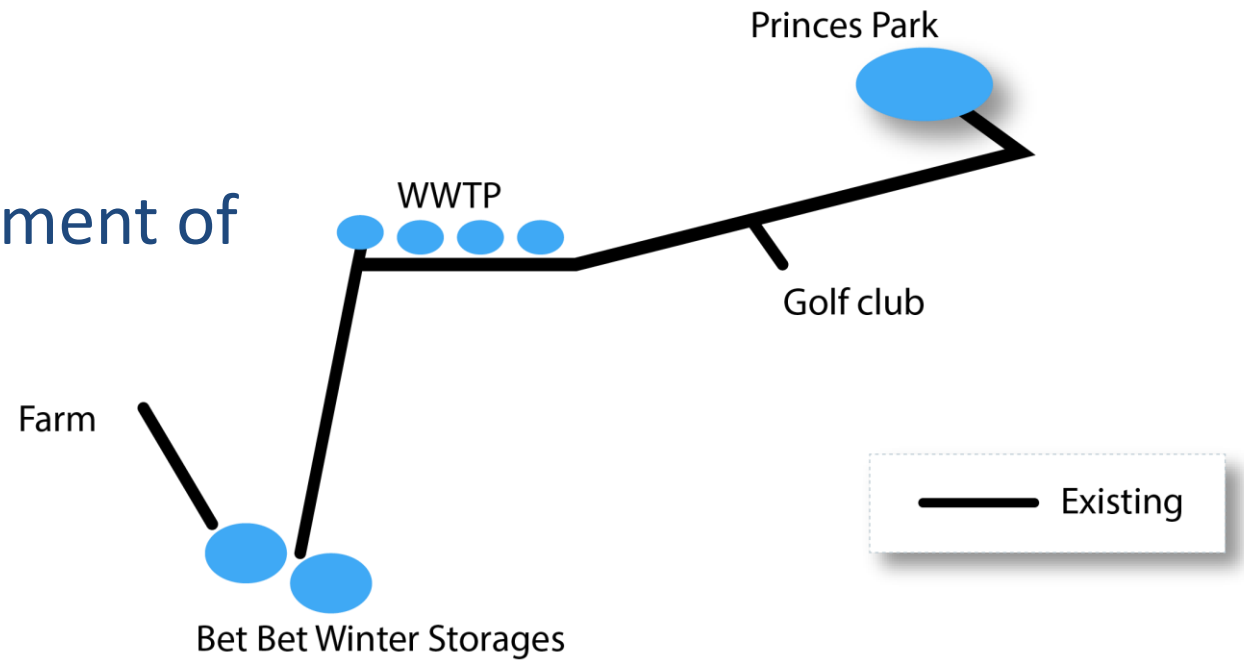


Key IWM Driver

Making the most of recycled water

600ML/year of recycled water use

Ongoing management of salinity is a focus



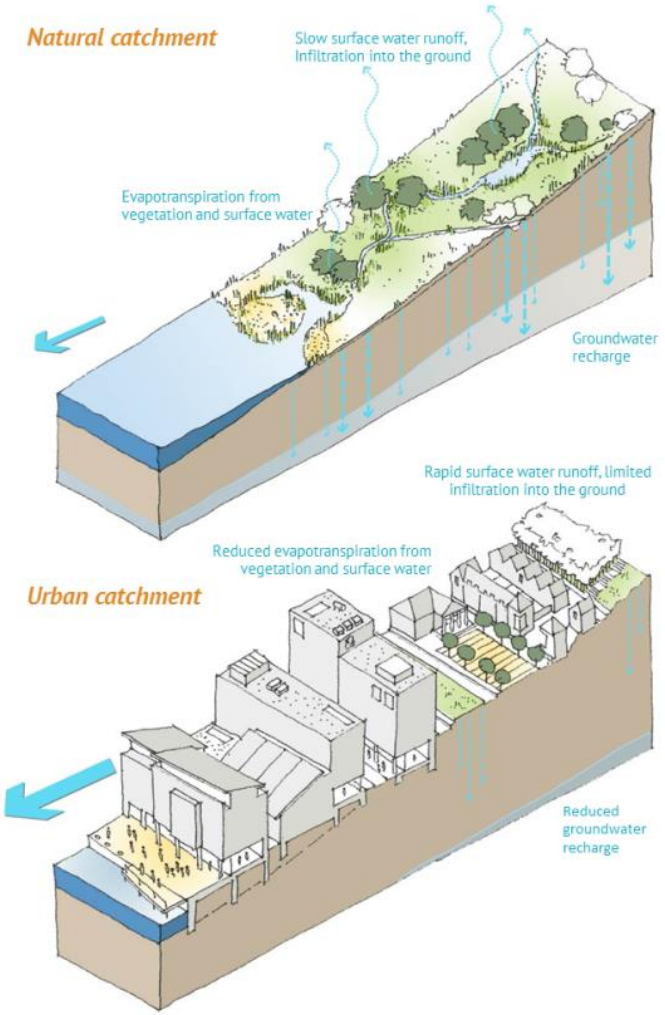
Key IWM Driver

Capturing ‘excess’ stormwater as a resource

Very little runoff from a natural catchment under local climate conditions

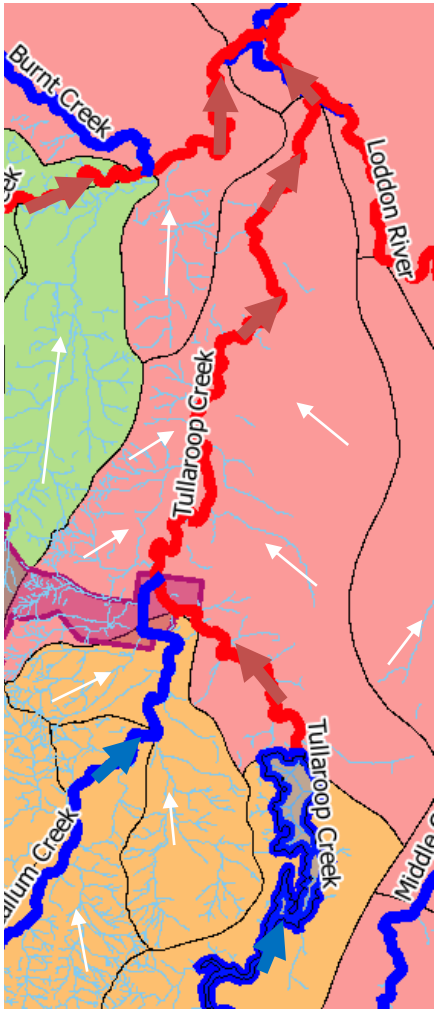
Significantly more runoff from roofs and paved surfaces in urban areas

This amounts to 800ML/year of ‘urban excess stormwater’ from Marybourough



Key IWM Driver

Supporting the health of natural assets



Key IWM Driver

Enhancing liveability, social and economic benefits

Strong and passionate community.

Identified statistically as the most disadvantaged community in Victoria in terms of average income.

Older community with a median age of 50 (compared with 37 in Victoria), and has lower than average levels of physical activity.

go goldfields
aspiring and achieving

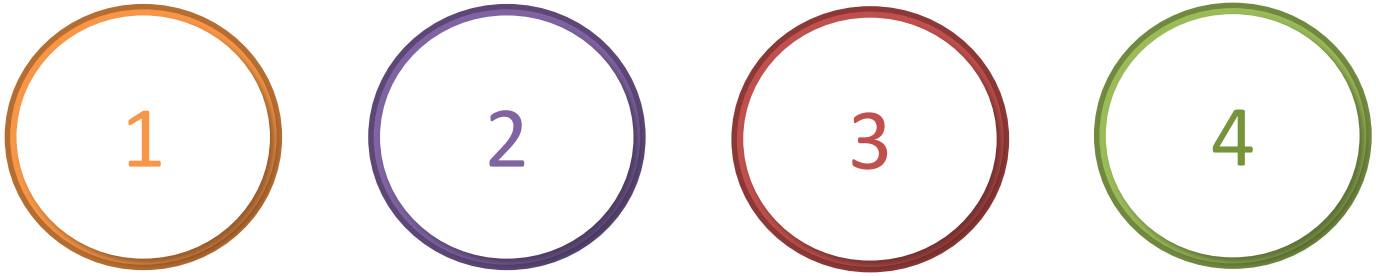
The Committee for Maryborough was established in 2018 with a vision “to lead Maryborough to be a centre of excellence for rural, economic and social transformation and renewal.”

IWM Plan Development Process

E2DESIGNLAB

Maryborough IWM Plan Development

4-Stage Journey



The Case for IWM: Drivers, Vision and Objectives

Exploring opportunities: Preliminary option assessment and shortlisting

Evaluating opportunities: Option analysis and evaluation

Setting a way forward: Recommendations and implementation plan

Stage 1:
Local Context, Ideas & Objectives

- All available background information collected and reviewed
- Stakeholder local knowledge, ideas and visions for the IWM Plan collected, analysed and consolidated
- Focused water and pollution balance developed to provide a understanding of local water cycle characteristics

Key drivers for Maryborough and themes

- Secure new water resources for the area
- Match fit-for-purpose water supplies with demands
- Enable the sustainable use of recycled water by reducing salinity
- Reduce ‘urban excess’ stormwater

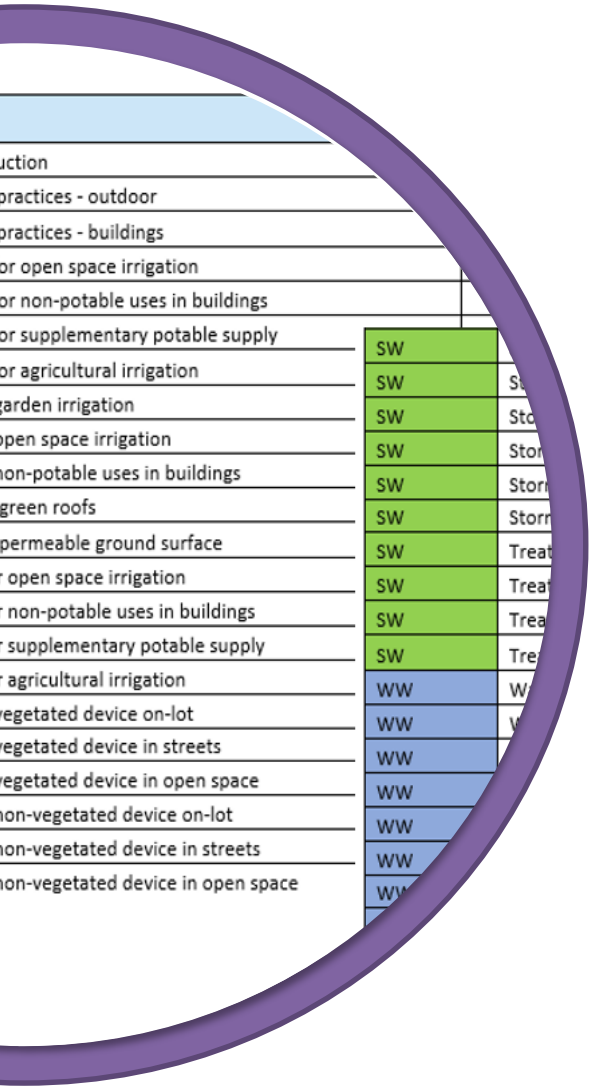
Resilient water cycle

- Improve the waterway health of Four Mile Creek, Bet Bet Creek and Tullaroop Creek
- Provide water for key assets including open spaces and water bodies
- Create new green assets and tree cover

Healthy landscapes and environment

- Support health and well-being of communities
- Support economic development
- Create great places to live that are affordable and effective
- Raise awareness of water in the community

Prosperous community and economy



Stage 2:
Project Identification & Shortlisting

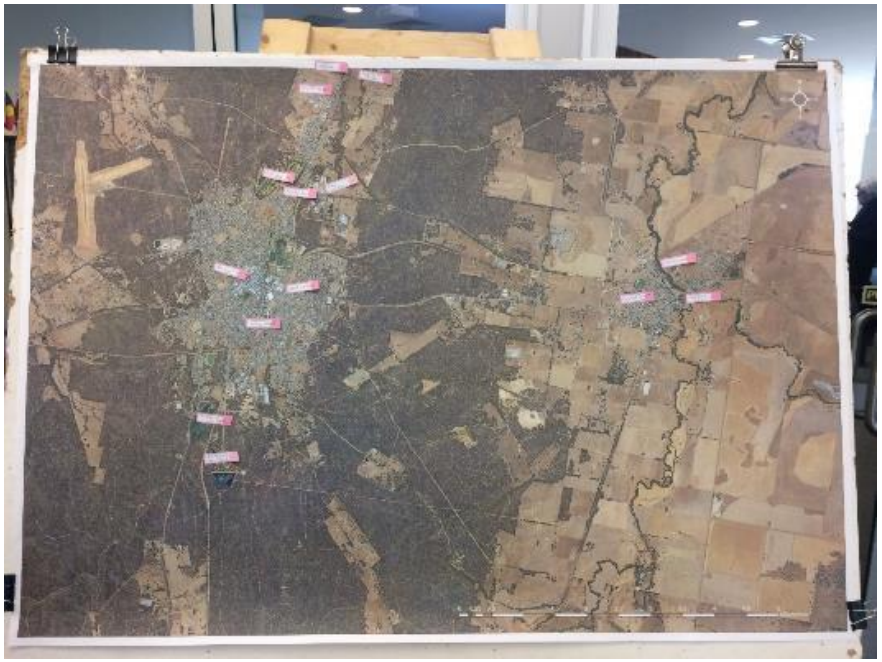
- Identified base case scenario
- Development of performance indicators to measure objectives and the merits of projects.
- Explored all potential water sources and end uses to generate a comprehensive list of possible projects
- Conducted a shortlisting of all projects with the Preliminary Assessment Measure (PAM).

Selected Performance Indicators – Preliminary assessment

Resilient water cycle	Healthy landscapes and environment	Prosperous community and economy
Potable water use reduction (ML/year)	Nitrogen reduction to waterways (kg/year)	New amenity or recreation areas (ha)
	Fit for purpose water for open space or water features (ML/year)	Potential for community engagement and education (no. of people)

IWM opportunities: Long list

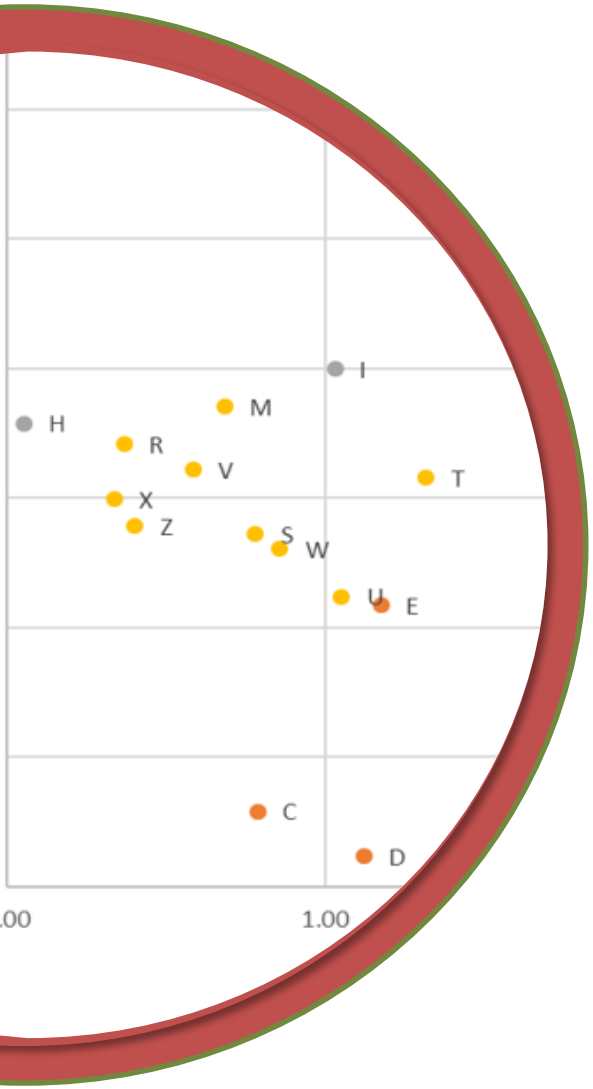
49 opportunities suggested
at a range of scales.



	Objective theme 1 Provide secure and sustainable water services	Objective theme 2 Protect and enhance health of receiving environments		Objective theme 3 Support liveability of the places we live and work			
	Quantifiable	Quantifiable	Quantifiable	Quantifiable	Quantifiable		
Option	**ML/Year of potable water replacement**	**ML/Year of urban excess removed from waterway**	**kg/year of nitrogen removed from waterway**	**ML/year of alternative water provided for recreation, productive uses**	**New green areas created in urban environment (ha)**	**Key Cost Factors** (A: Advantage, D: Disadvantage)	**Risk review**
Rainwater managed by green infrastructure (roof rainwater only)	-	493	9046	493	18	A. Increased amenity A. Site treatment A. Reduce SW pollutants A. Store drainage A. Available land D. Maintenance	Org. capacity Complex construction Ongoing active management need
Stormwater harvesting for open space irrigation	32	32	78	32		A. Reduce drainage A. Water supply augmentation D. Land constraints D. High land cost D. Variable supply	Public health hazard Water quality
Stormwater harvesting for open space irrigation	73	73	176	73		A. Available land A. Low cost land A. Water supply augmentation A. Reduce drainage D. Variable supply	Public health hazard Water quality
Stormwater harvesting for non-potable uses in buildings and open space	2327	2327	5653	381		A. Available land A. Low cost land A. Water supply augmentation A. Reduce drainage D. Variable supply	Public health hazard Water quality
Stormwater harvesting for non-potable uses in buildings and open space (+BVUG2)	3173	3173	7710	521		A. Available land A. Low cost land A. Reduce drainage A. Economies of scale A. Water supply augmentation A. Storage D. Variable supply	Public health hazard Water quality
Stormwater harvesting for supplementary potable supply (most)	5588	5588	13580	1274		A. Available land A. Low cost land A. Reduce drainage A. SW treatment A. Water supply augmentation A. Storage D. Variable supply D. Potable treatment cost	Org. Capacity Regulatory inconsistencies Approval requirements Water Quality Public perception Public health hazard
Stormwater harvesting for supplementary potable supply (cost)	639	639	1552	146		A. Available land A. Low cost land A. Reduce drainage A. SW treatment A. Water supply augmentation A. Storage D. Variable supply D. Potable treatment cost	Regulatory inconsistencies Approval requirements Water Quality Public perception Public health hazard

Shortlisted Options for Analysis

Improving new development areas	• Requiring rainwater tanks on all homes • Requiring stormwater-fed street trees
Improving green assets in Maryborough	• Introducing stormwater-fed street trees to retail centre • Improving water quality in Lake Victoria by introducing a wetland
Securing stormwater as a new resource	• Harvesting treated stormwater from Lake Victoria for green space irrigation • Stormwater harvesting at Station Domain • Harnessing Maryborough's stormwater as a large scale supplement to Centenary Reservoir
Improving recycled water resources for irrigation	• Shandying existing network with stormwater • Shandying existing network with raw water



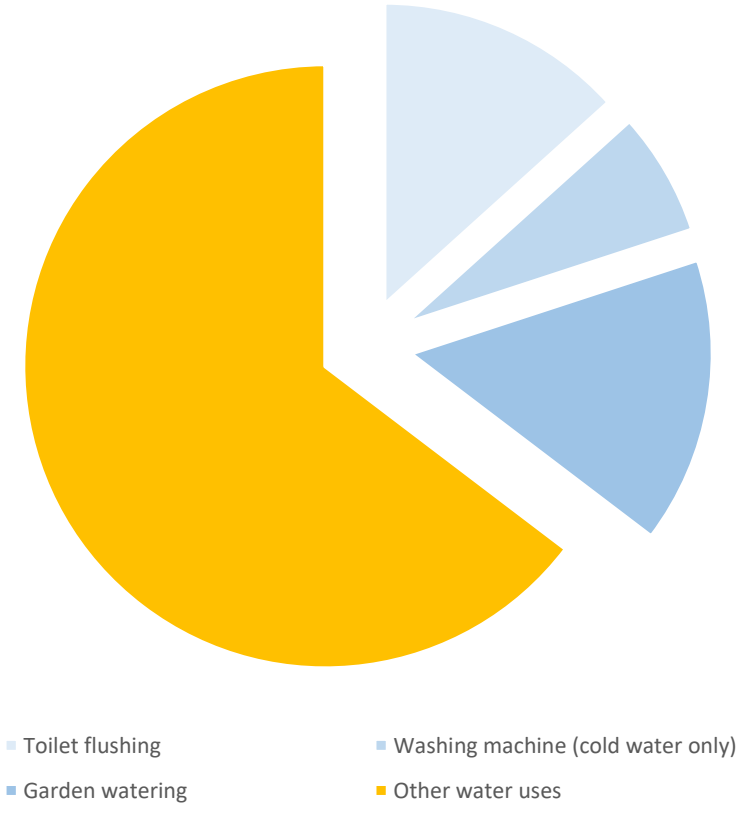
Stage 3:
Option Evaluation & Refinement

- A project's costs and benefits are quantified
- Project's performance is measured against the 3 IWM categories

Improving new development areas

- Requiring rainwater tanks on all homes

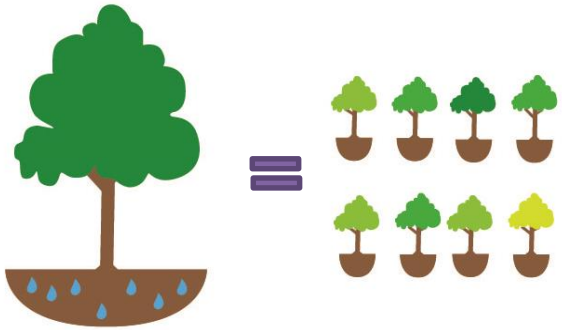
Proportion of household water demands which would be connected to on-lot rainwater tank



Improving new development areas

- Requiring stormwater-fed street trees

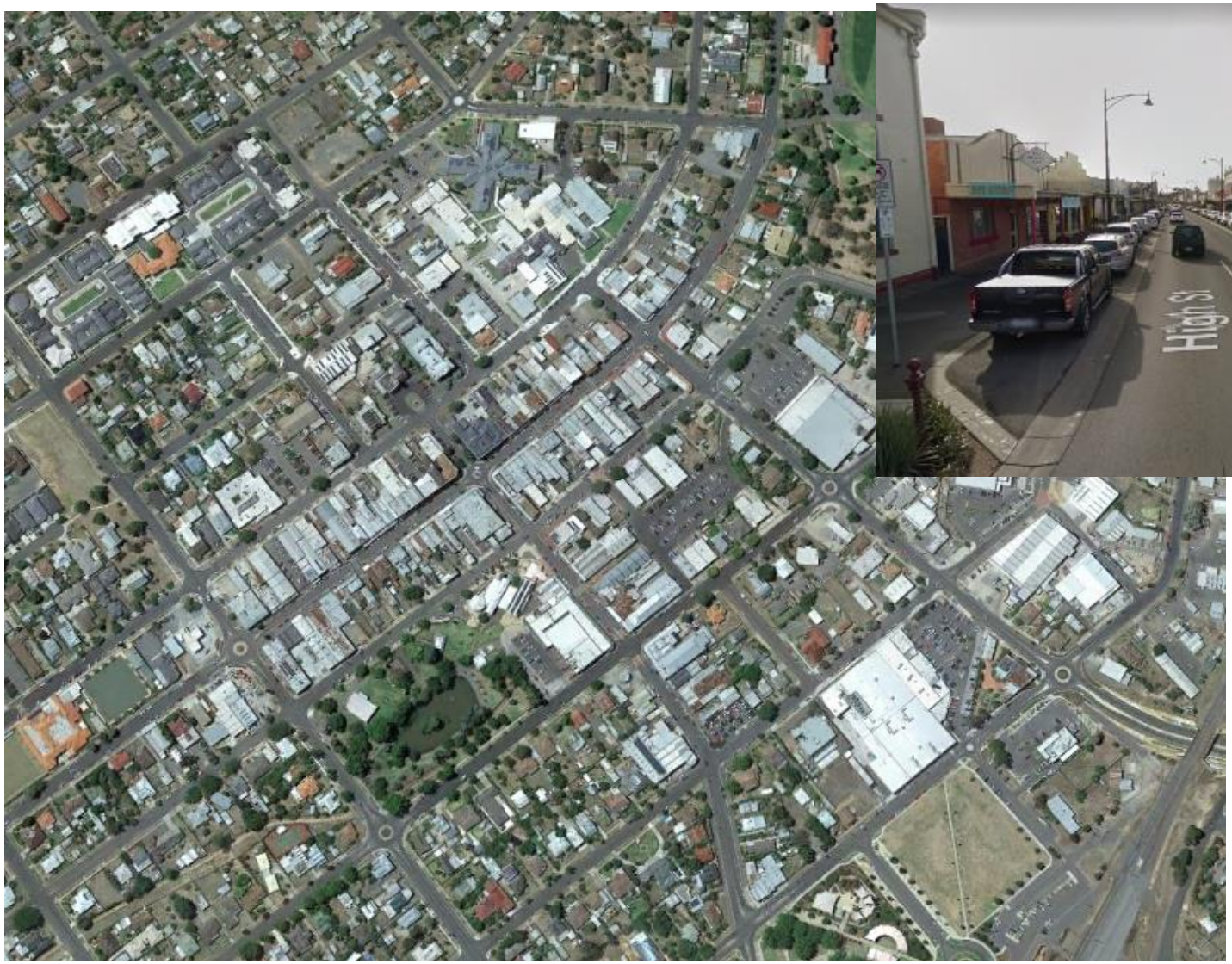
Relatively low density development lends itself to simple integration of passively watered trees in verges, by slightly sinking and area around the tree and creating a drop in the kerb.



1 tree in ideal conditions = 8 conventional urban trees

Improving green assets in Maryborough

- Introducing stormwater-fed street trees to retail centre



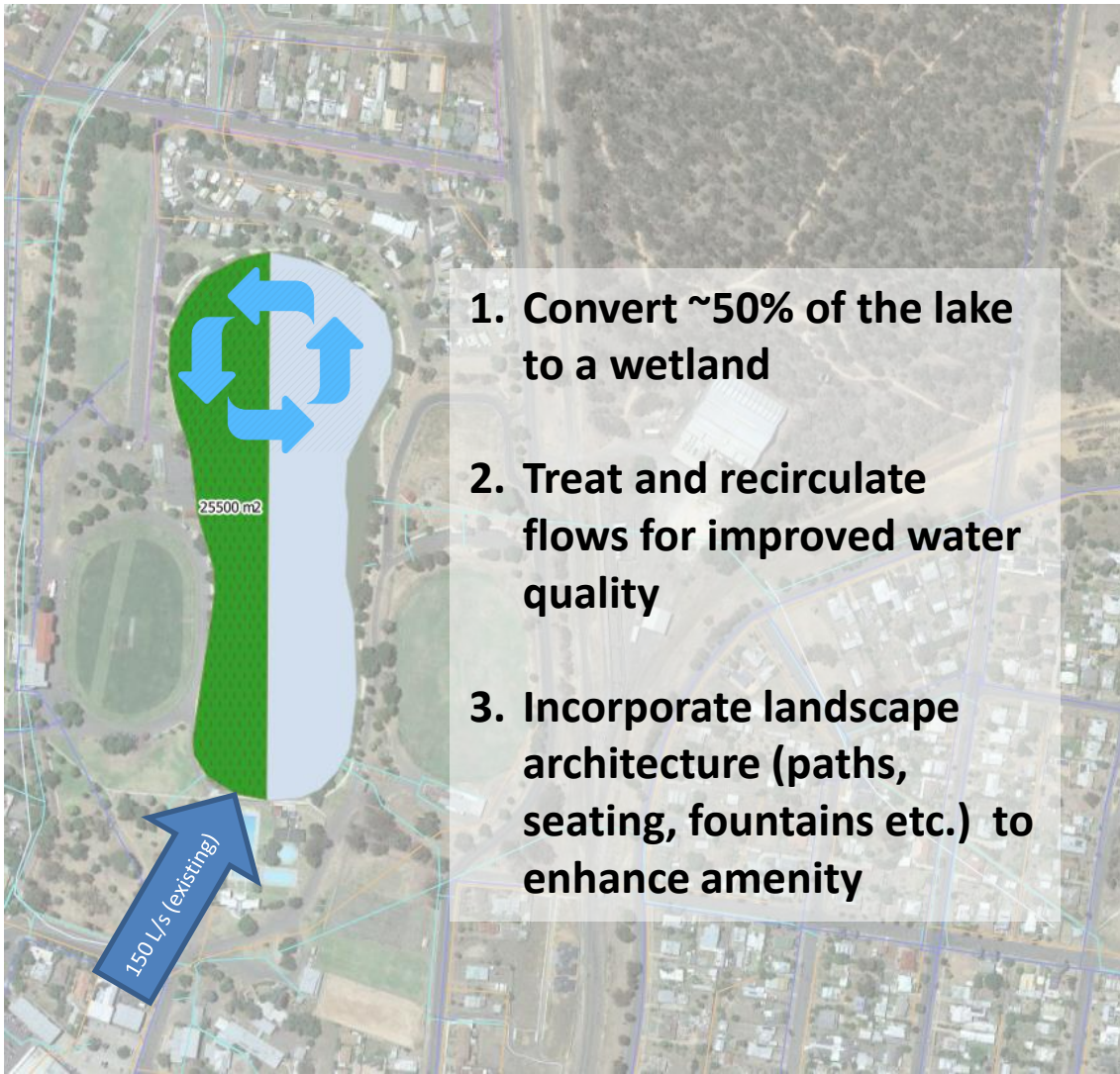
Improving green assets in Maryborough

- Improving water quality in Lake Victoria by introducing a wetland

- Opportunity to improve water quality and amenity of Lake Victoria
- Could integrate board walks and secure a deep pool area for fishing and light recreation
- 50% of lake required (24,000m2) to convert to wetland to ensure pollutant load reduction to manage water quality

Improving green assets in Maryborough

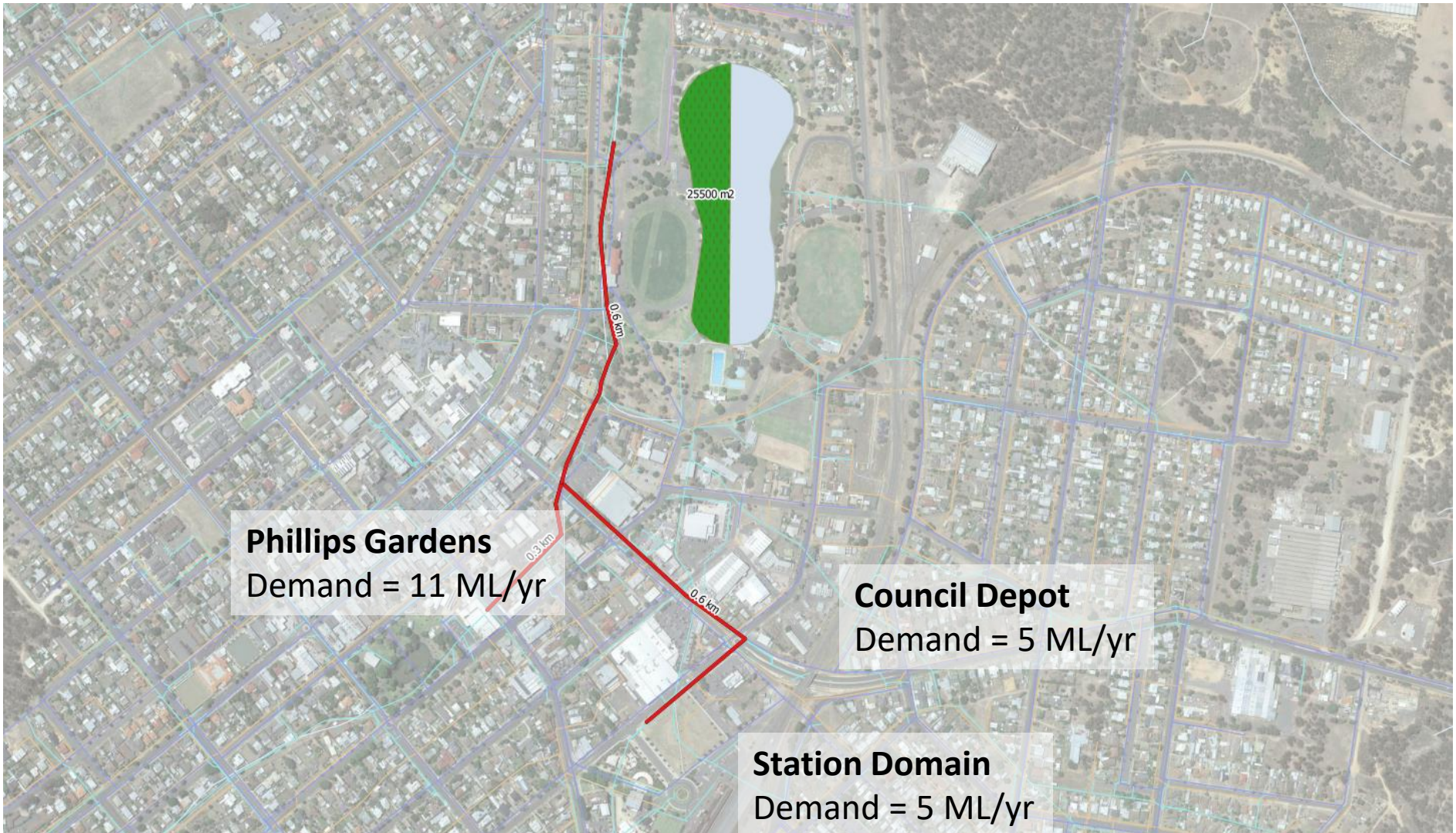
- Improving water quality in Lake Victoria by introducing a wetland



1. **Convert ~50% of the lake to a wetland**
2. **Treat and recirculate flows for improved water quality**
3. **Incorporate landscape architecture (paths, seating, fountains etc.) to enhance amenity**

Securing stormwater as a new resource

- Harvesting treated stormwater from Lake Victoria for green space irrigation

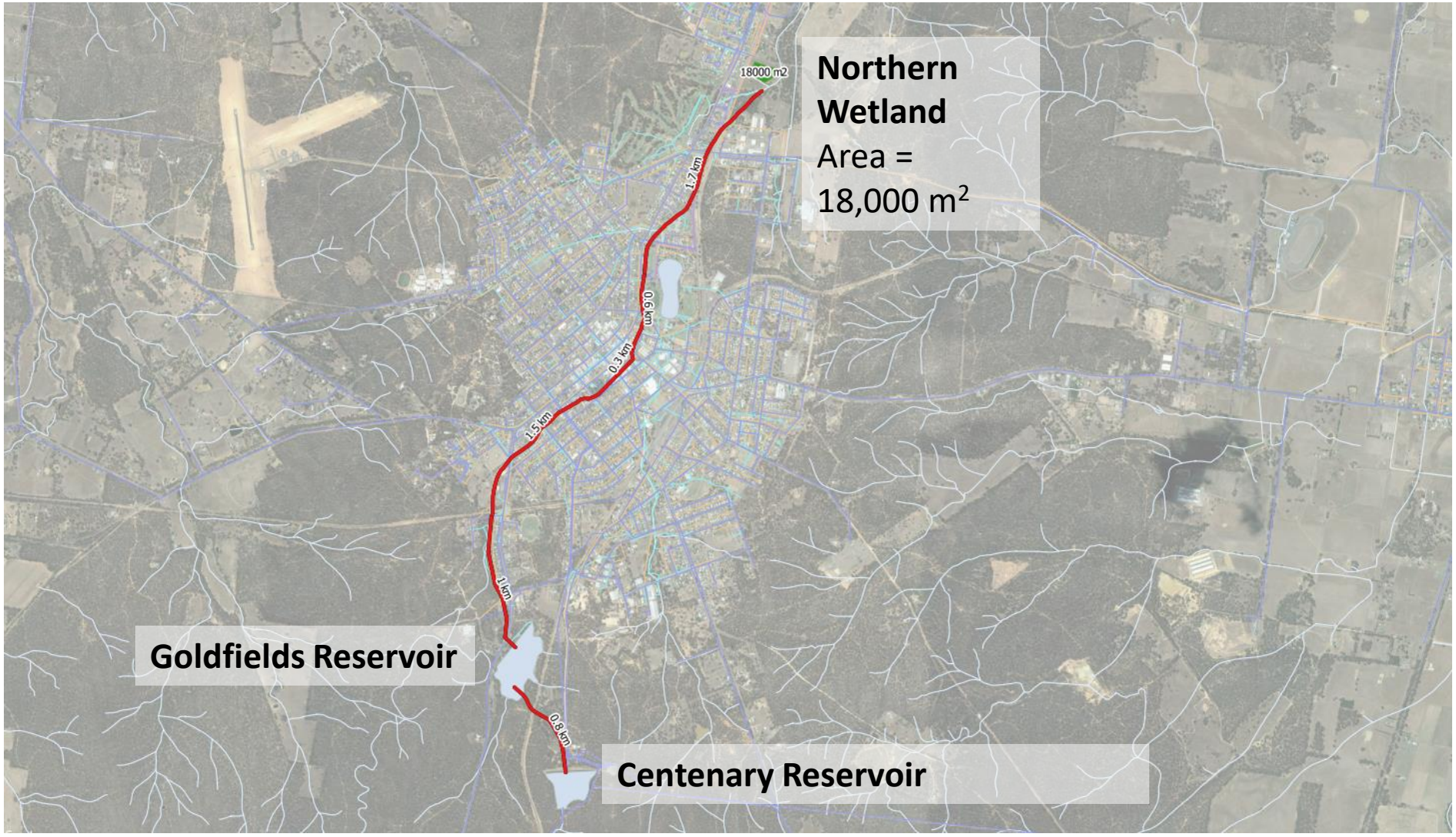


Securing stormwater as a new resource

- Stormwater harvesting at Station Domain

Securing stormwater as a new resource

- Harnessing Maryborough's stormwater as a large scale supplement to Centenary Reservoir



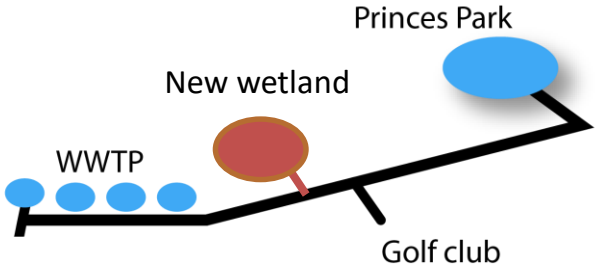
Improving recycled water resources for irrigation

- Shandying existing network with stormwater
- Shandying existing network with raw water

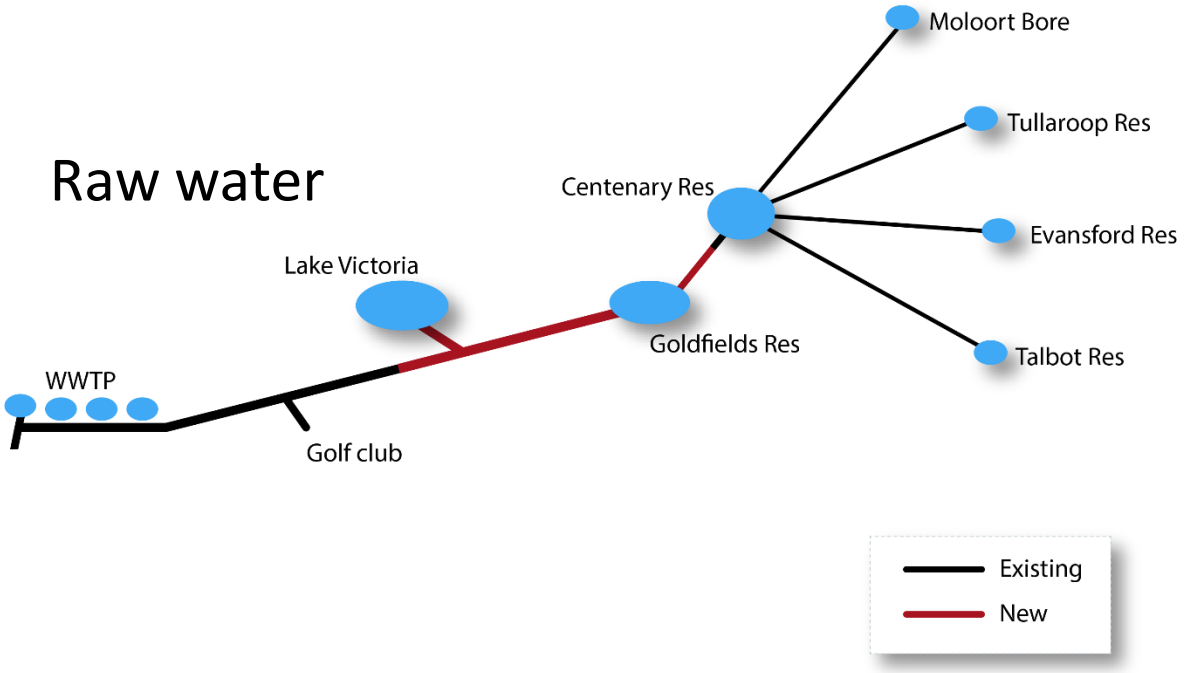
Stormwater or raw water could be harnessed to shandy supply to:

- Golf course (90ML demand total)
- Princes park (20ML demand total)

Stormwater



Raw water



Stage 4:
Business Case
& Delivery Pathways

- Evaluate business case and prioritise projects
- Address barriers and challenges
- Develop delivery pathways

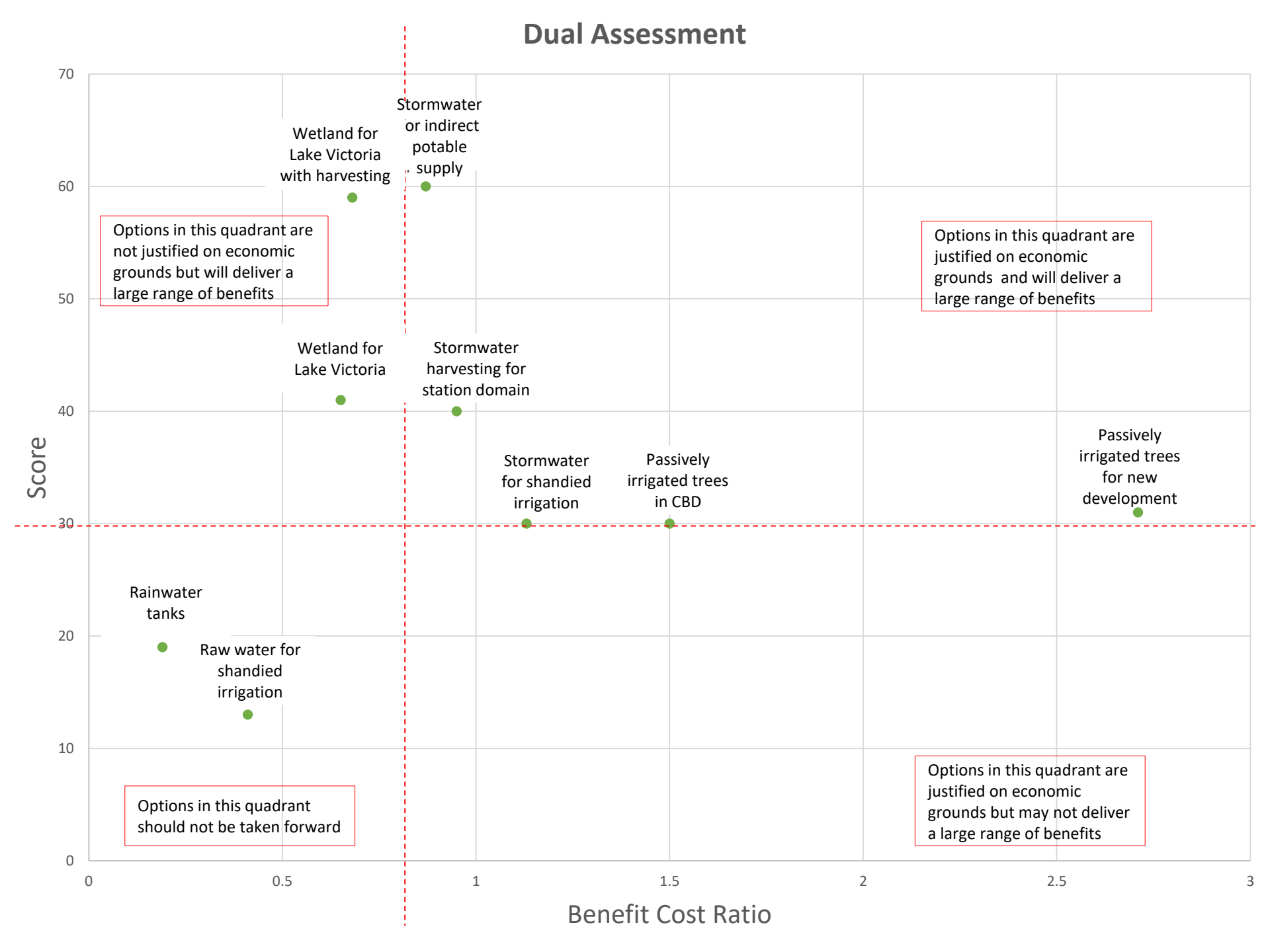
Dual Assessment

Economic analysis

- Phased lifecycle costs
- Monetised benefits where possible
- Benefit-cost ratio
- Understanding of distribution of costs and benefits

Scored performance analysis

- Series of performance indicators developed for IWM objectives
- Quantitative and relative where possible
- Qualitative and relative for risk and delivery indicators

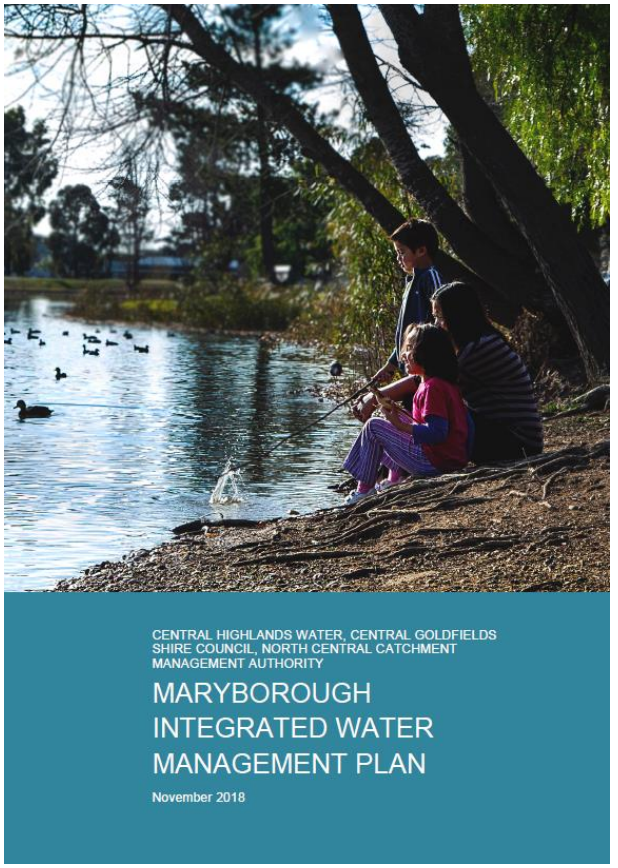

Dual Assessment
Score
Benefit Cost Ratio
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
Stormwater or indirect potable supply
Wetland for Lake Victoria with harvesting
Wetland for Lake Victoria
Stormwater harvesting for station domain
Stormwater for shandied irrigation
Passively irrigated trees in CBD
Passively irrigated trees for new development
Rainwater tanks
Raw water for shandied irrigation
Options in this quadrant are not justified on economic grounds but will deliver a large range of benefits
Options in this quadrant are justified on economic grounds and will deliver a large range of benefits
Options in this quadrant should not be taken forward
Options in this quadrant are justified on economic grounds but may not deliver a large range of benefits

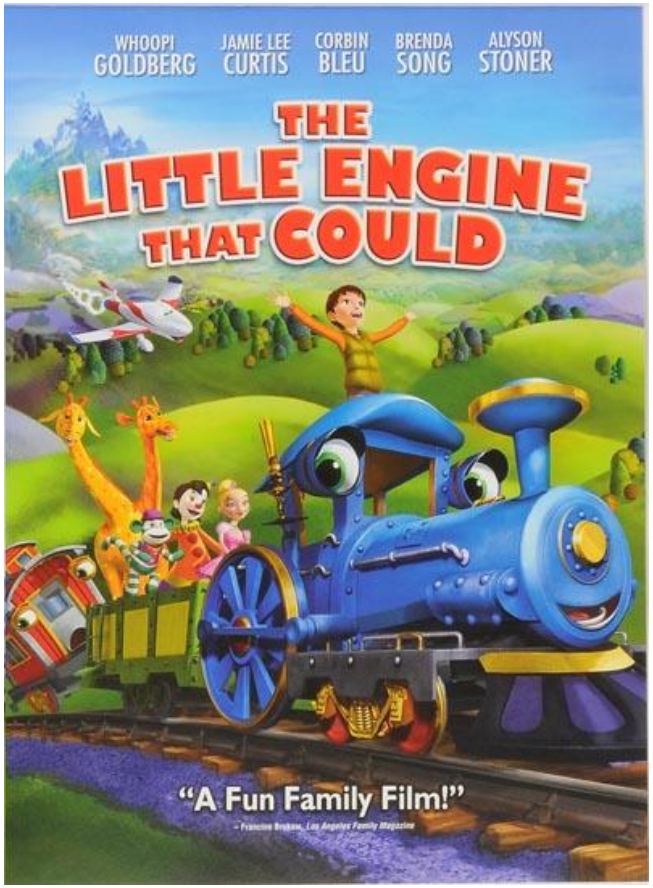
Strategy and Recommendations

Full implementation plan developed with short and long term actions

Five focus areas:

1. Creating governance and delivery structures to support IWM
2. Harnessing stormwater for healthier street trees
3. Greening station domain as a key community asset
4. Creating a resilient and local alternative water supply network
5. Improving Lake Victoria for recreation and amenity





Thank you

Contact:

Celeste@e2designlab.com.au

Questions?