

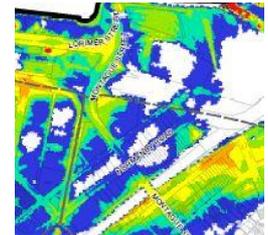
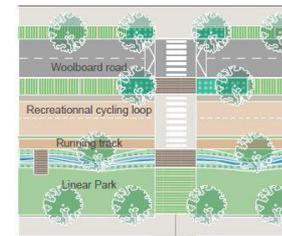


Fishermans Bend

Water sensitive drainage and flood management strategy

Sam Innes | City of Port Phillip

Philip Joyce | GHD



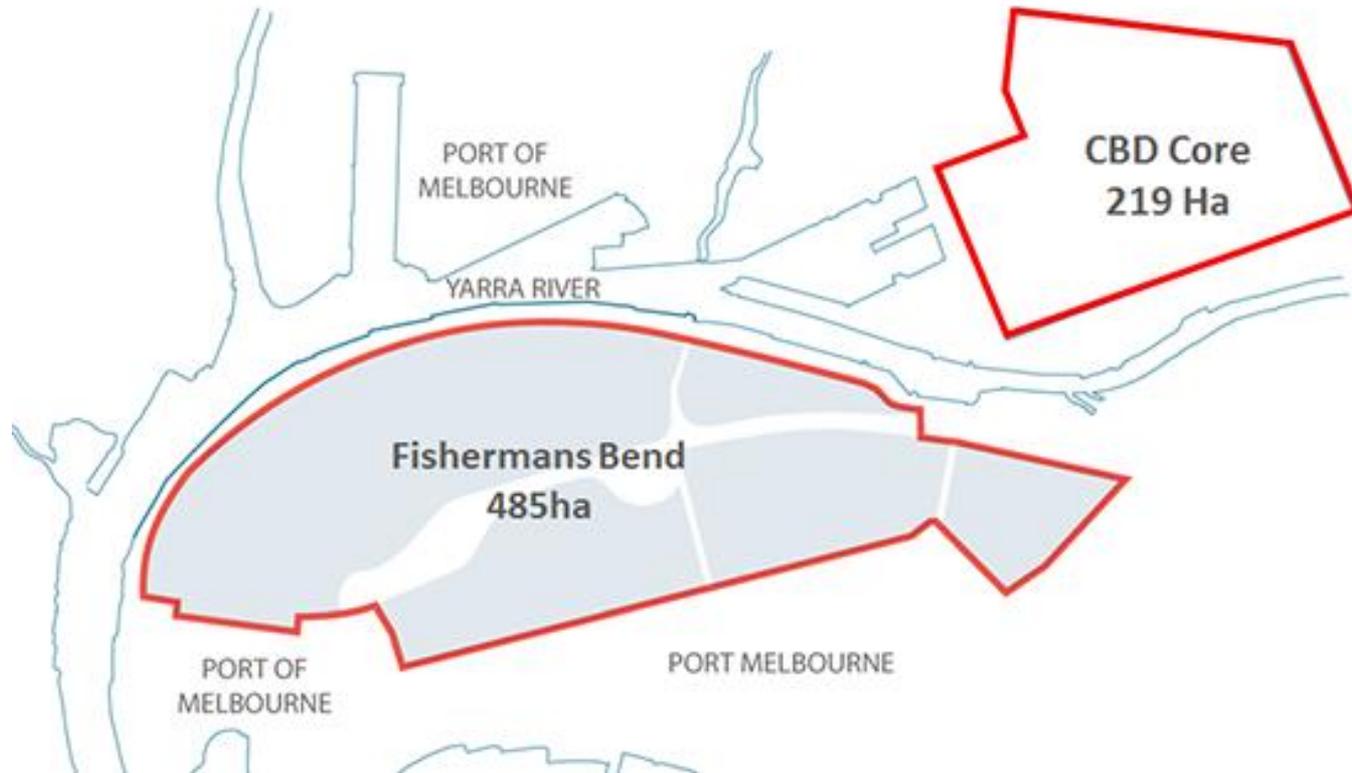
Content

- Background to Fishermans Bend
- Challenges
- Development of the strategy - place making
- Development of the strategy - modelling and analysis



Background to Fishermans Bend

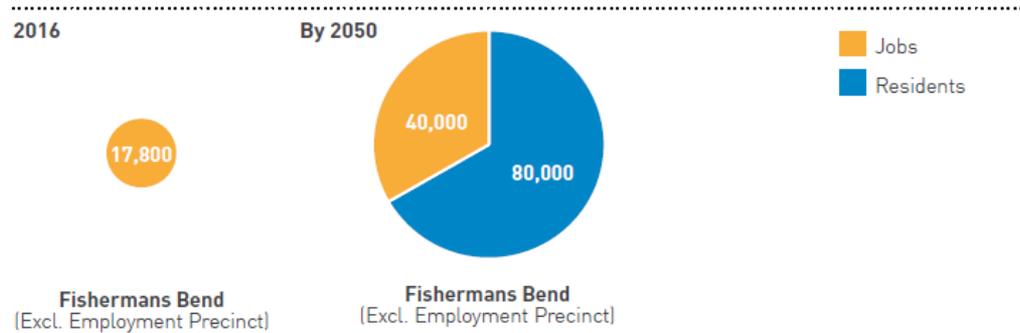
The scale and the opportunity



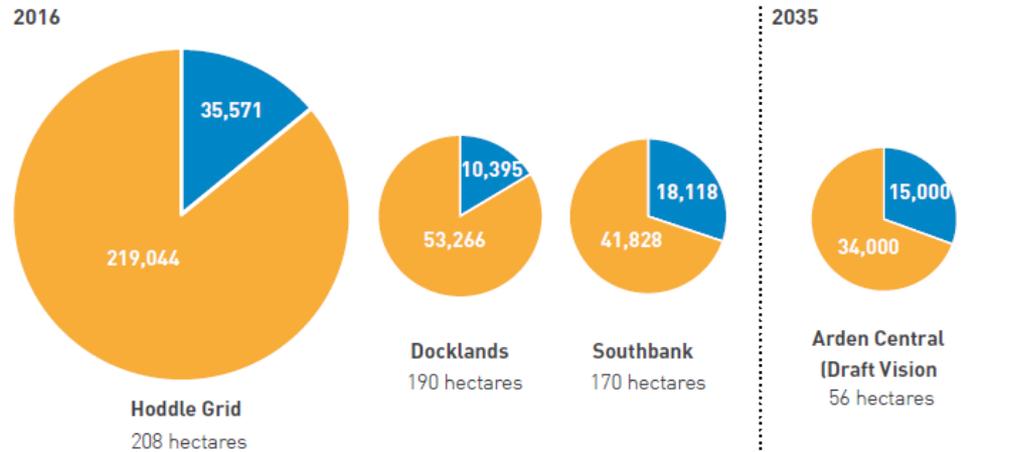
**One of the largest
brownfield developments
in the Southern
Hemisphere**

Capital City Zone Expansion of the central city

Fishermans Bend



Melbourne inner city precincts



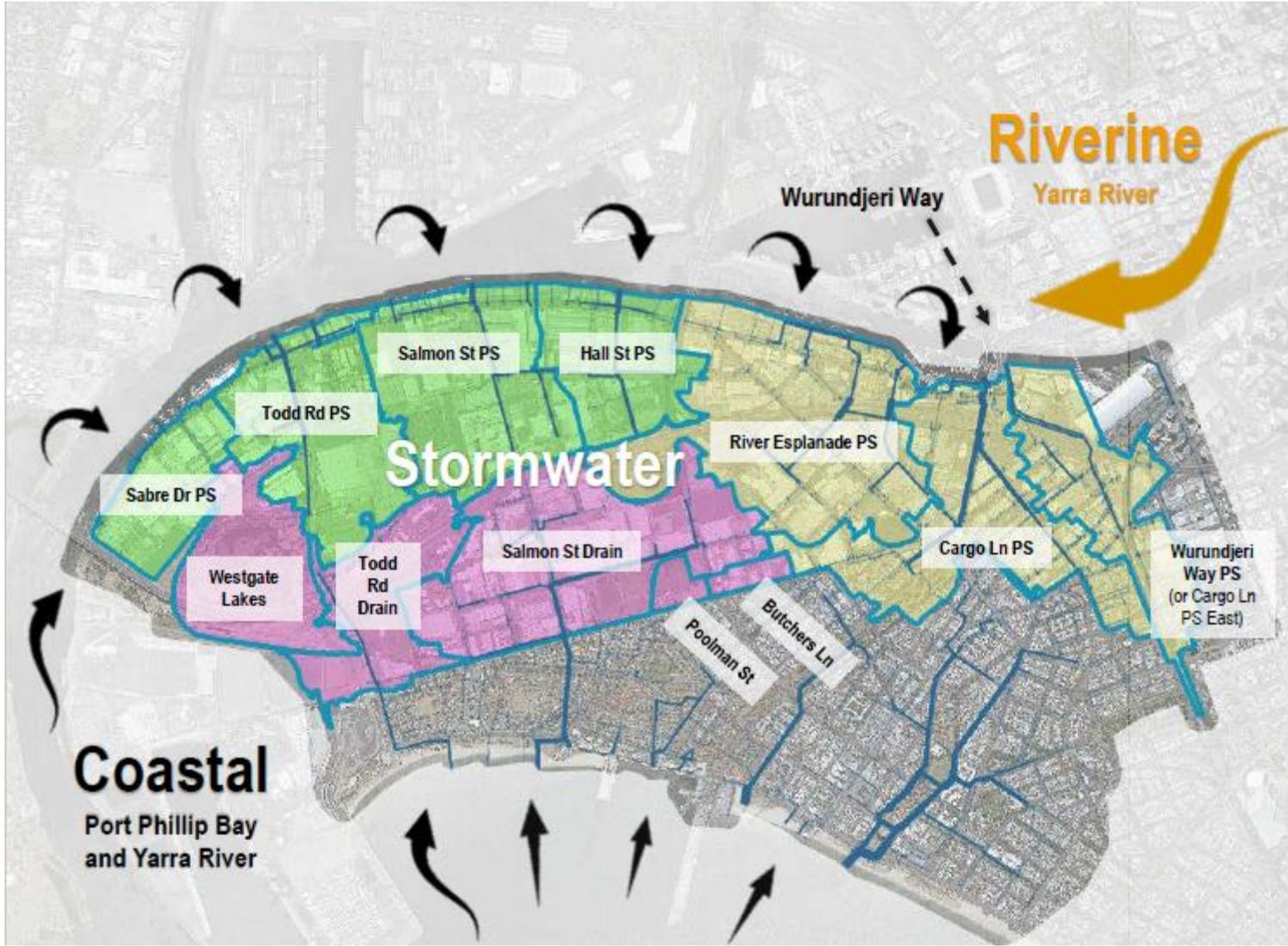
Source: Fishermans Bend Urban Design Strategy, Hodyl + Co

A lowland swamp with an industrial past...

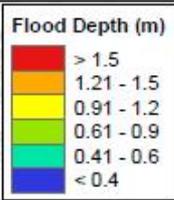


Challenges

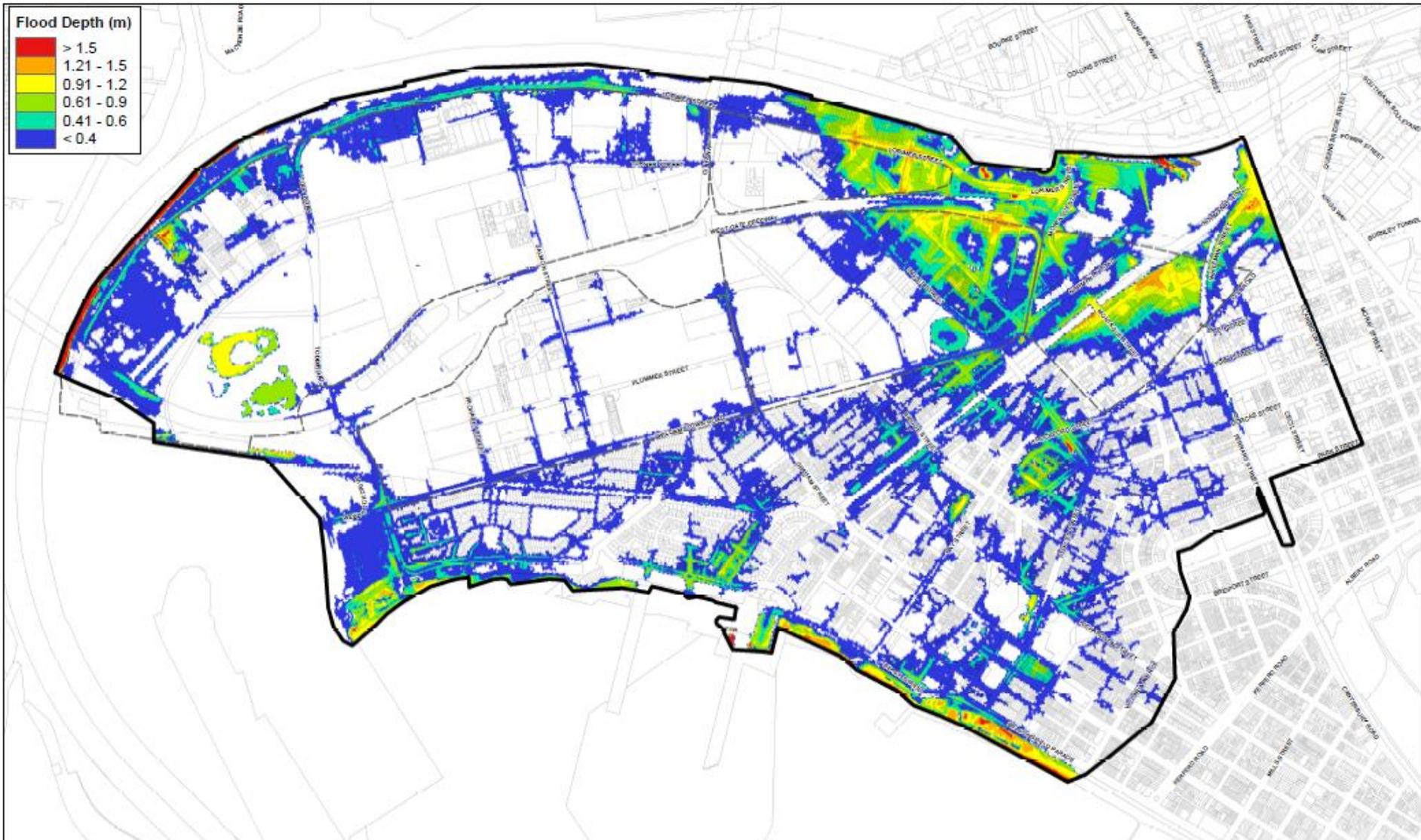
Sources of flooding



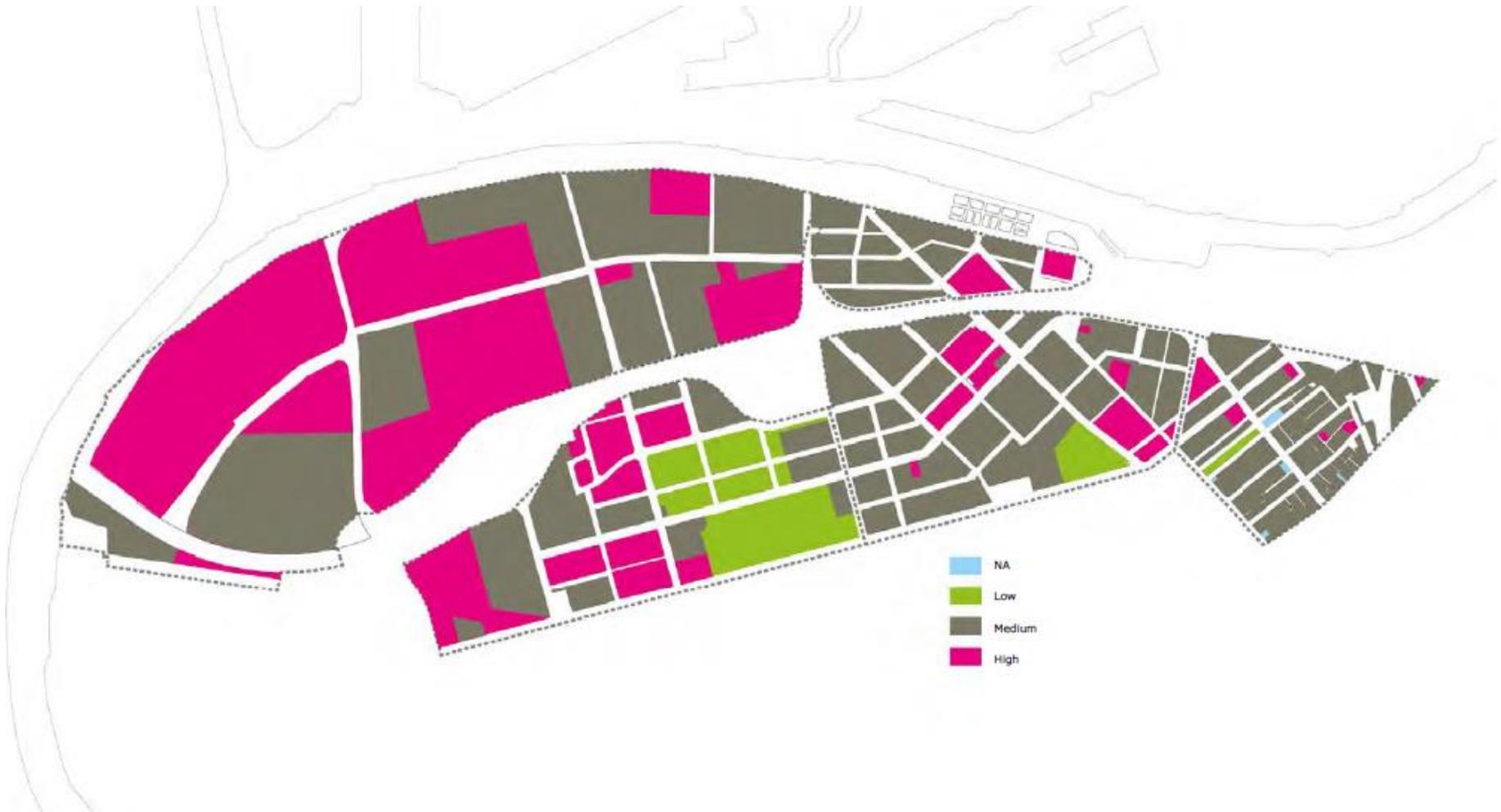
Flood risk – 1% AEP currently



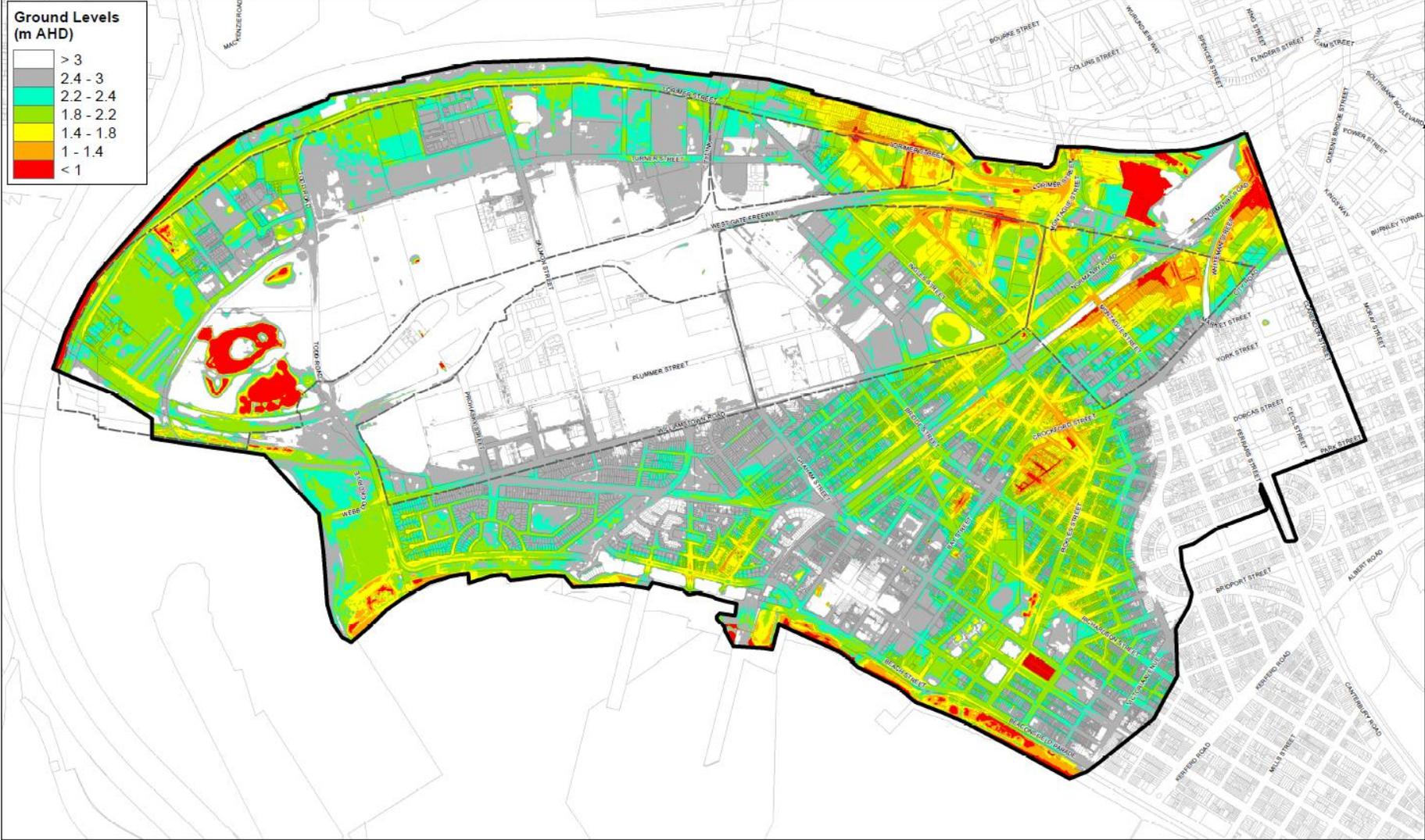
Flood risk – 1% AEP in 2100 with climate change



Ground contamination

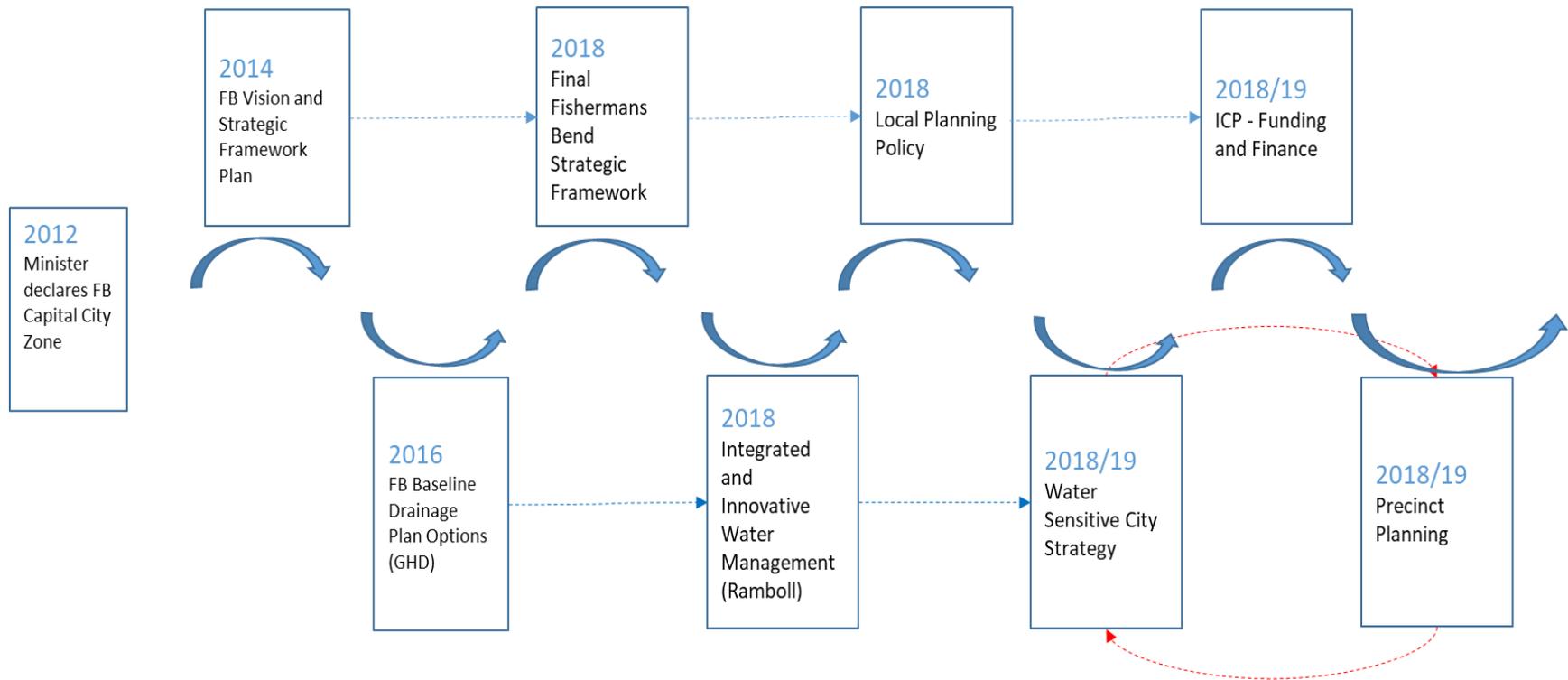


Groundwater



**Development of the strategy
- place making**

Water Planning meets Strategic Planning

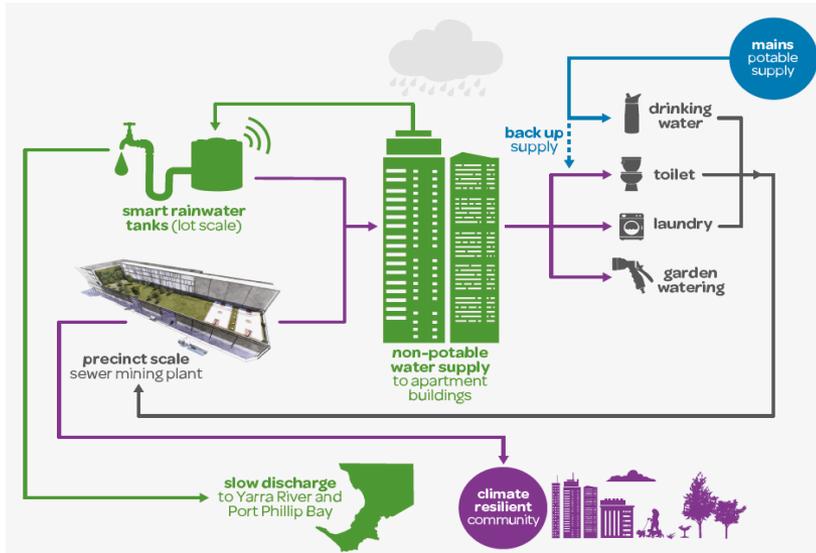


A water sensitive community

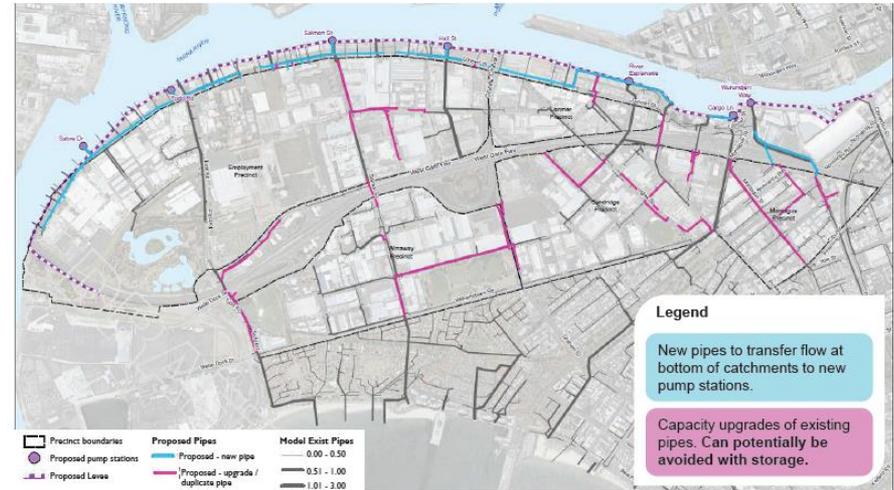
Stormwater detention will be provided within buildings. Landscapes will be designed to incorporate water sensitive urban design principles to improve water quality and manage flooding (FB Vision 2016).



The baseline water plan



Baseline Drainage Plan Infrastructure



Source: Fishermans Bend Framework, Victorian Government

Turning the water challenges into an opportunity



Cooperative Research Centre for Water Sensitive Cities 2016

Green Streets and Cloudburst Boulevards

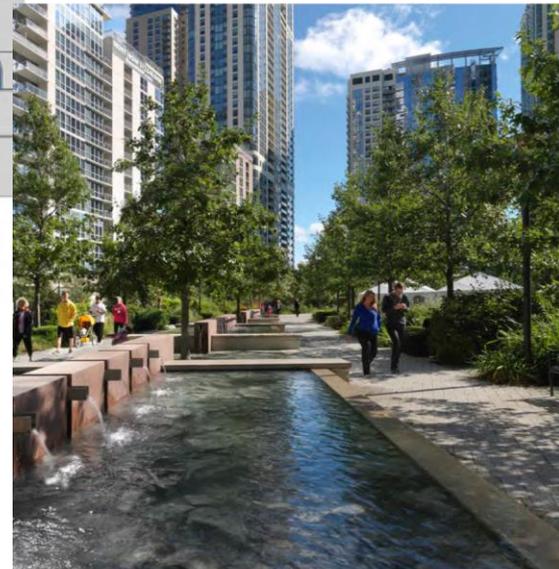
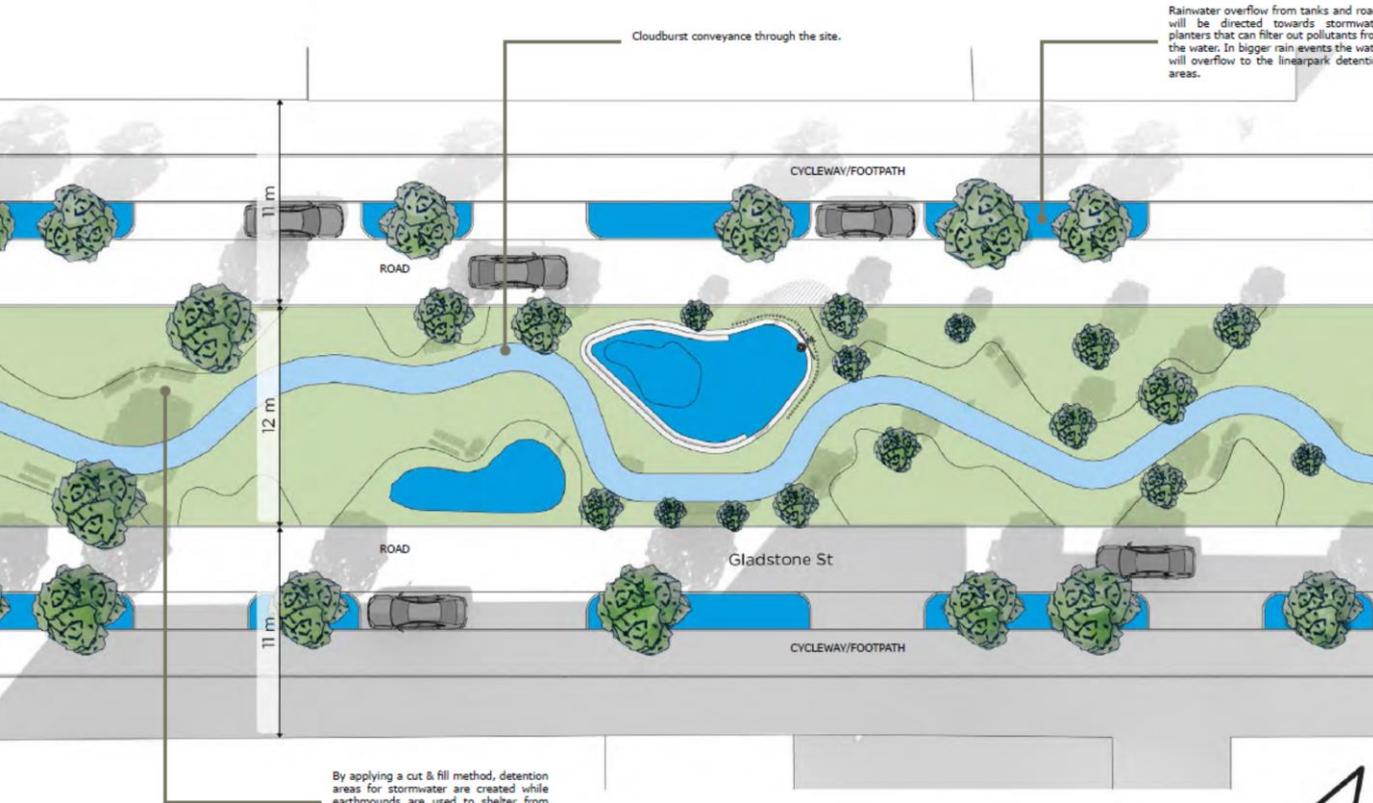
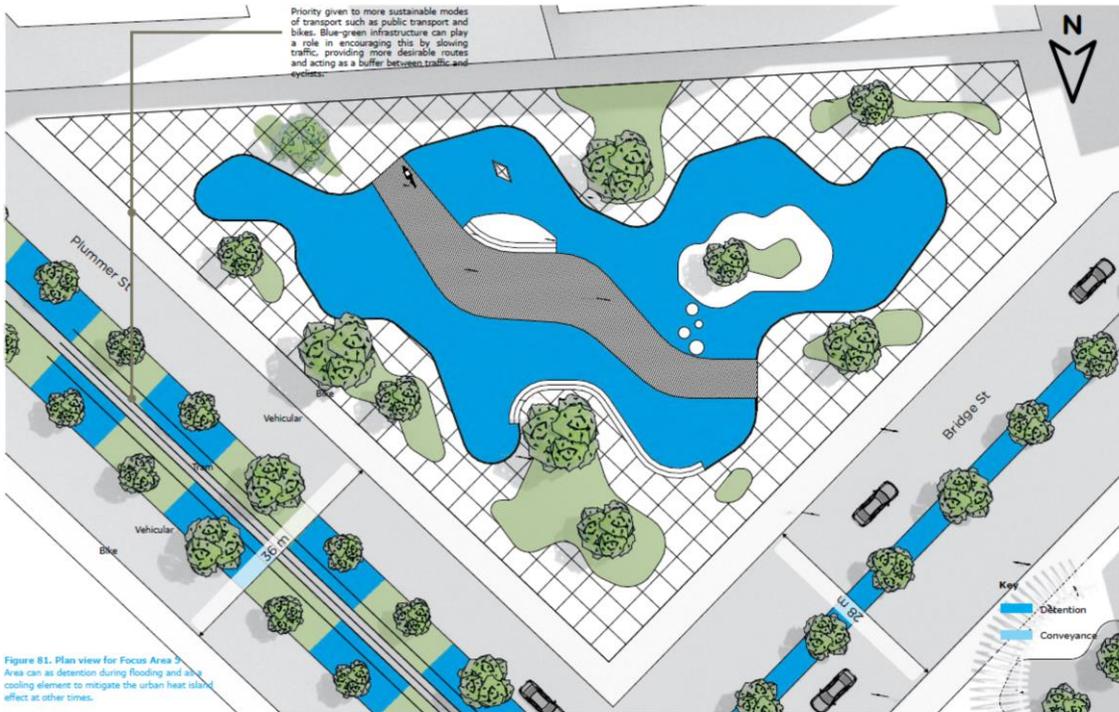


Figure 77. Plan section of Focus Area 4
Flood management in a cloudburst boulevard.

Ramboll 2016



The Water Plaza



Ramboll 2016



Potsdamer Platz © Atelier Dreiseitl



Benefits of distributed storage over pipes

- Improved social resilience to flooding.
- Sets a precedent for urban renewal by finding a natural solution to the problem.
- Helping to define the character of the place through water being visible.
- Where drainage is a driver, it will ensure that greening happens and more quickly.
- Reduced reliance on operation of pumps in a storm event through the slow release of flood water.
- Storages provide multiples lines of defence reducing local flooding impacts.
- Reduced cost of pipes.
- Reduced flooding impacts south of the precinct in Port Melbourne.



Flooding level of service

5% AEP

Roads & public realm

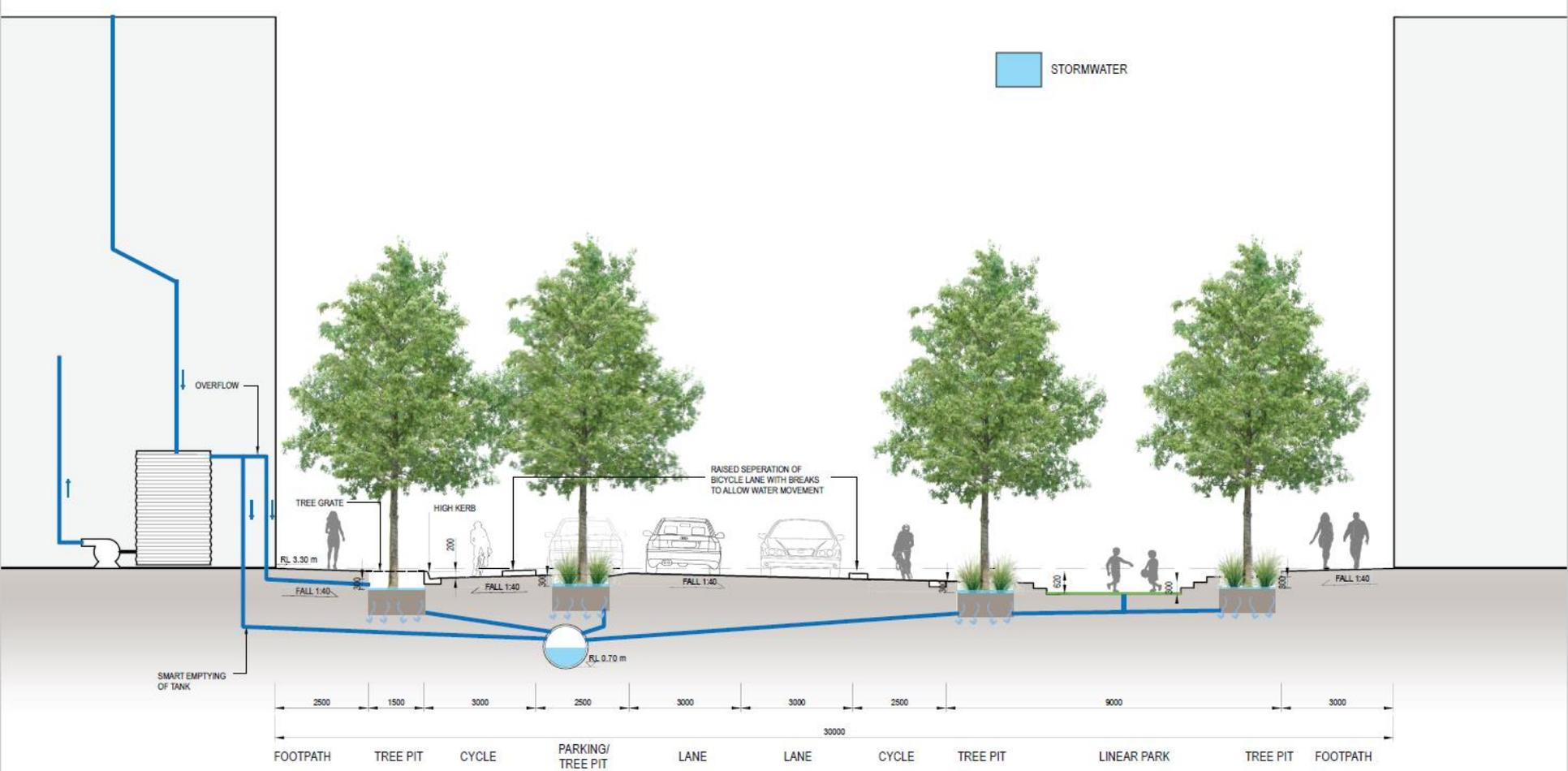
All surfaces including roads and the public realm must remain free of flooding in any event up to a 5% AEP flood event.

1% AEP

Private realm (within property boundaries) & footpaths

Properties and footpaths must remain free of flooding in any event up to a 1% AEP flood event.

Hybrid in 5 yr ARI event

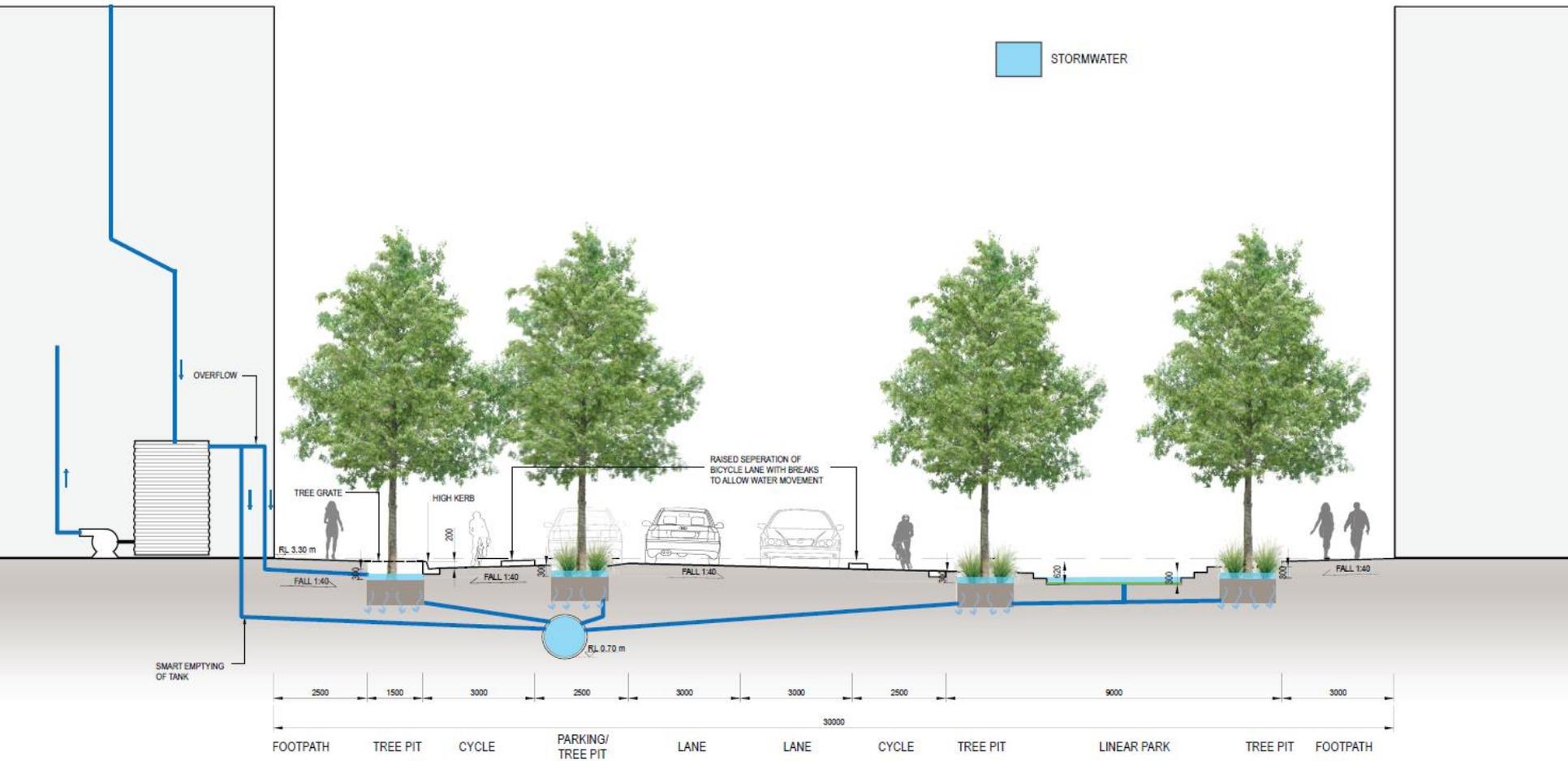


TYPICAL STREET SECTION WITH STORAGE
IN A 5 - YR ARI EVENT

SCALE 1:100 @A3 0 1 2 5 m



Hybrid in 10 yr ARI event

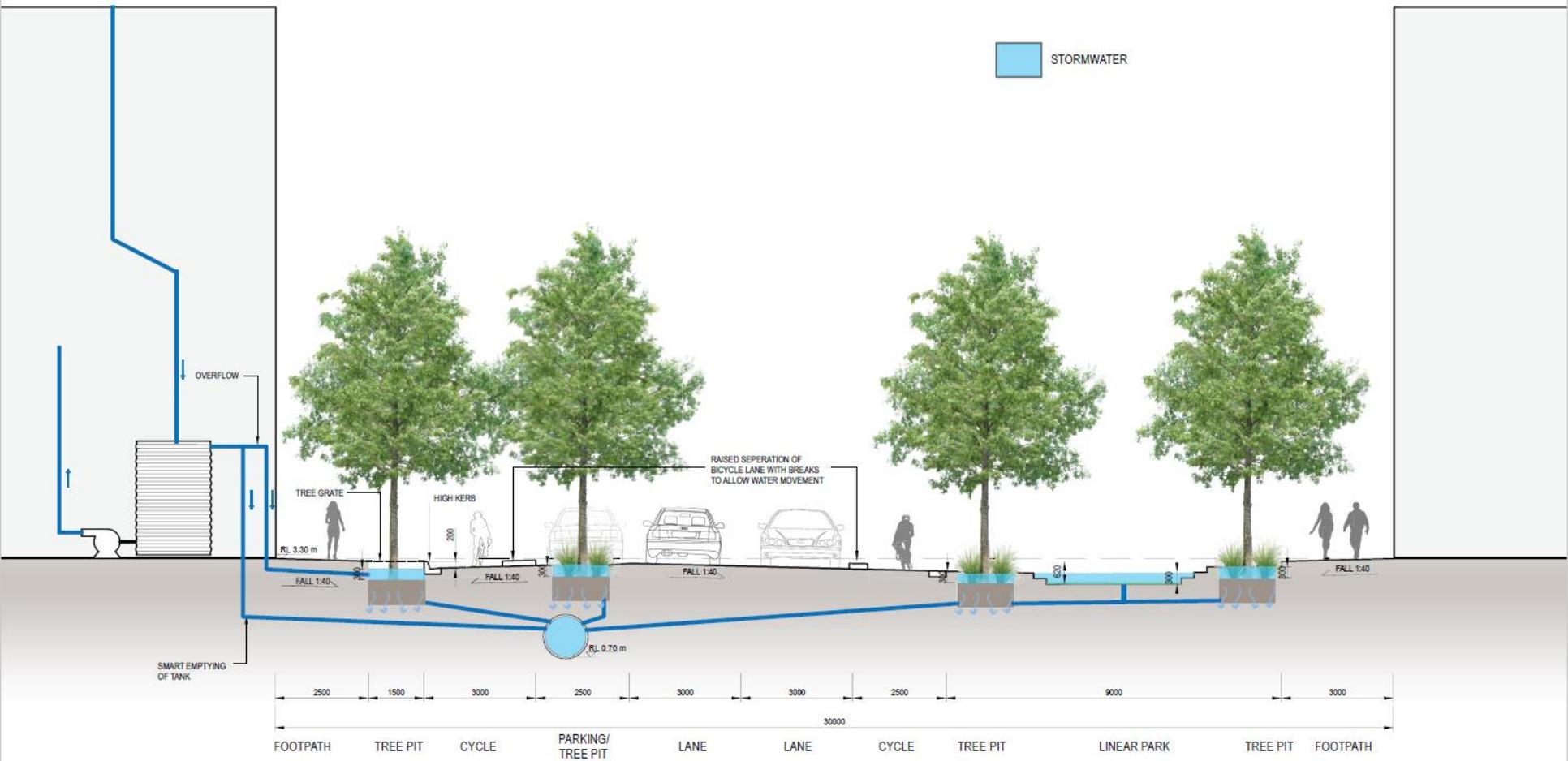


TYPICAL STREET SECTION WITH STORAGE
IN A 10 - YR ARI EVENT

SCALE 1:100 @A3 0 1 2 5 m



Hybrid in 20 yr ARI event

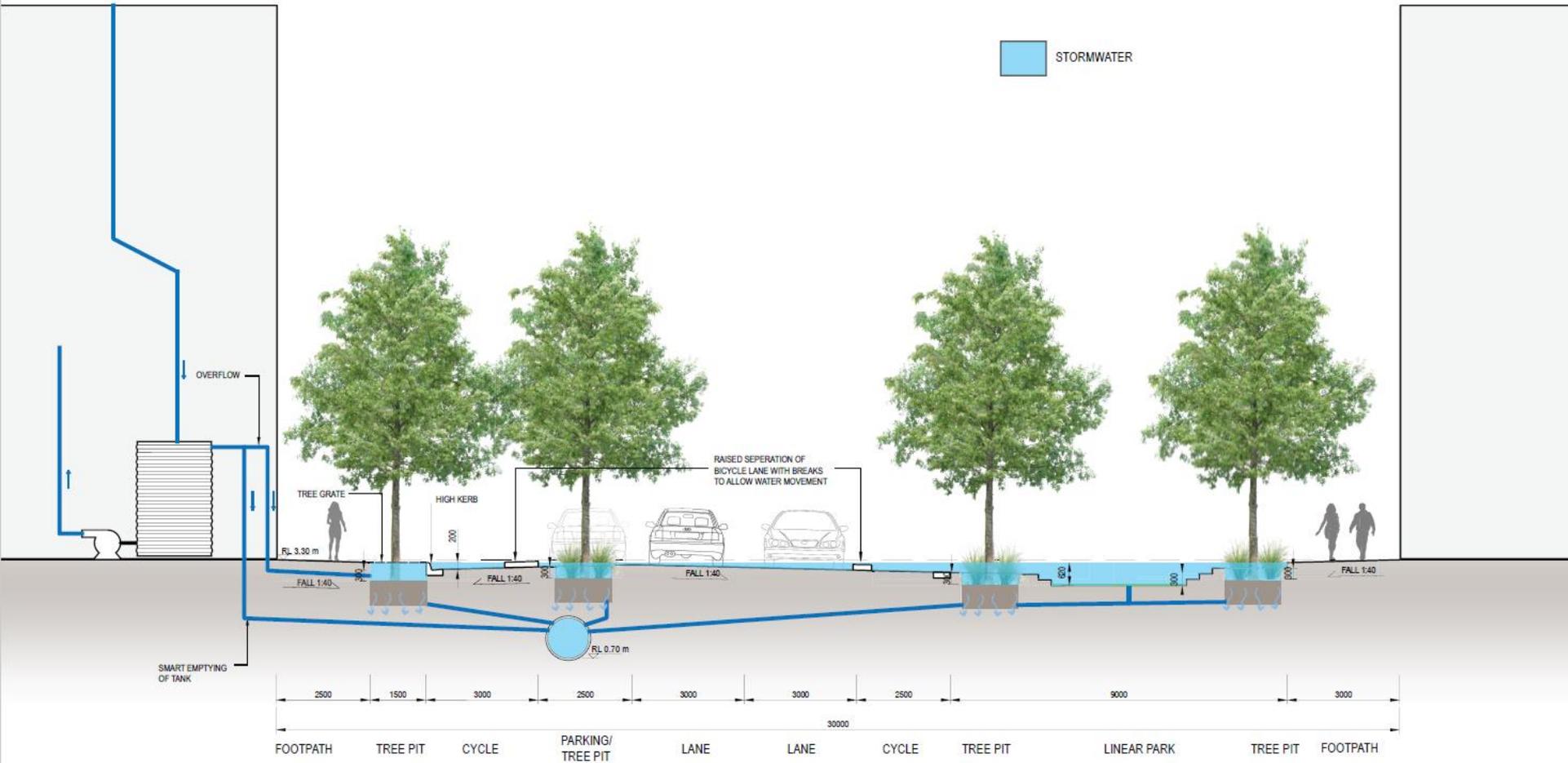


TYPICAL STREET SECTION WITH STORAGE
IN A 20 - YR ARI EVENT

SCALE 1:100 @A3 0 1 2 5 m



Hybrid in 100 yr ARI event



TYPICAL STREET SECTION WITH STORAGE
IN A 100 - YR ARI EVENT

SCALE 1:100 @A3 0 1 2 5 m

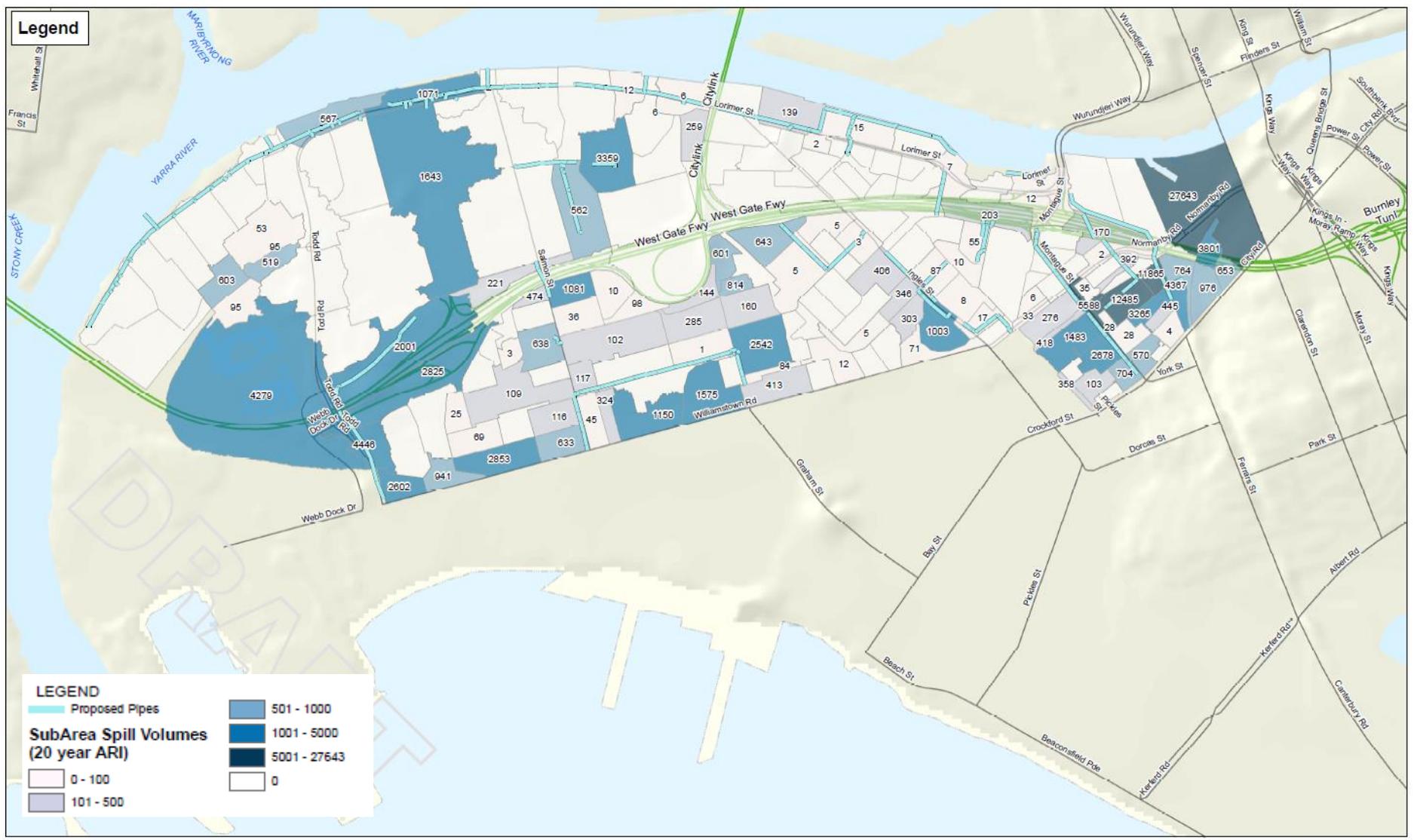


**Development of the strategy
- modelling and analysis**

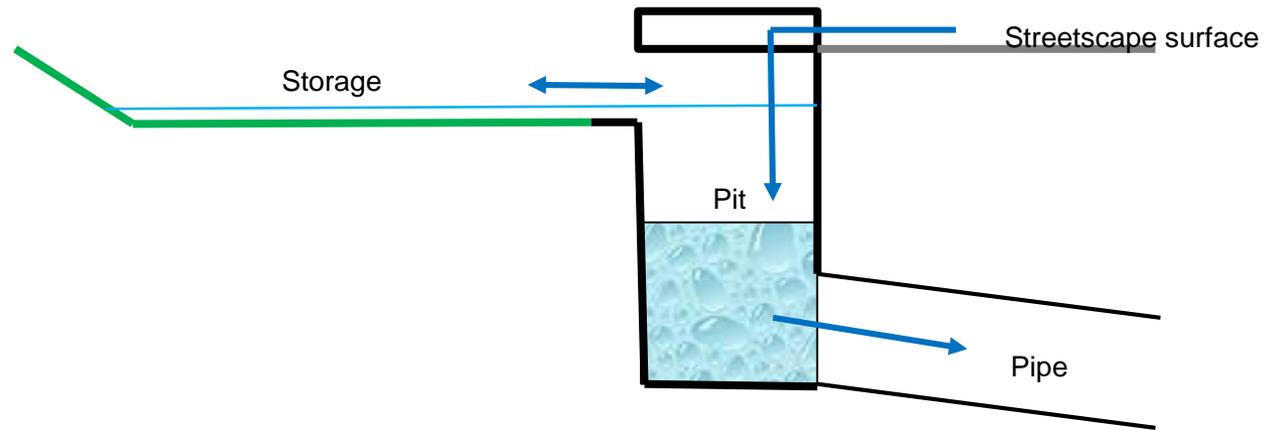
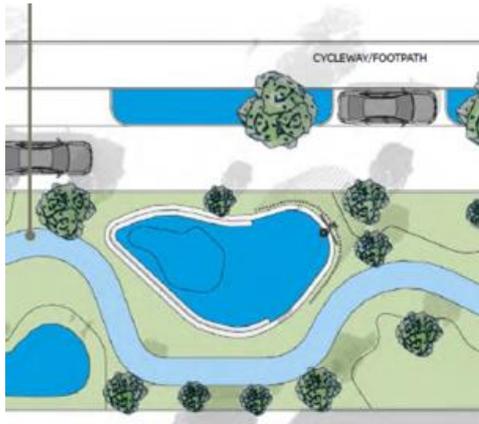
Baseline drainage plan



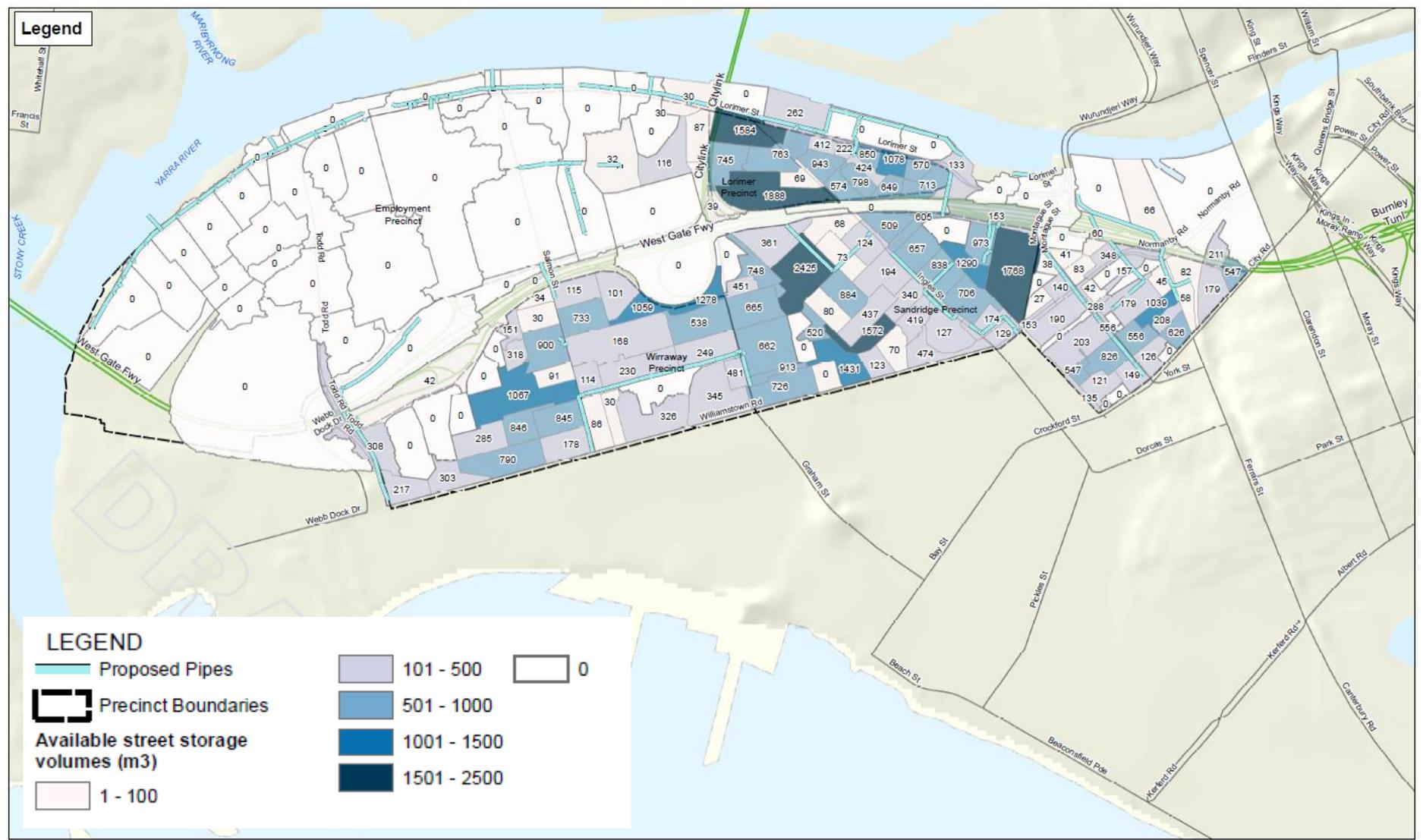
Required storage to avoid pipe upgrades



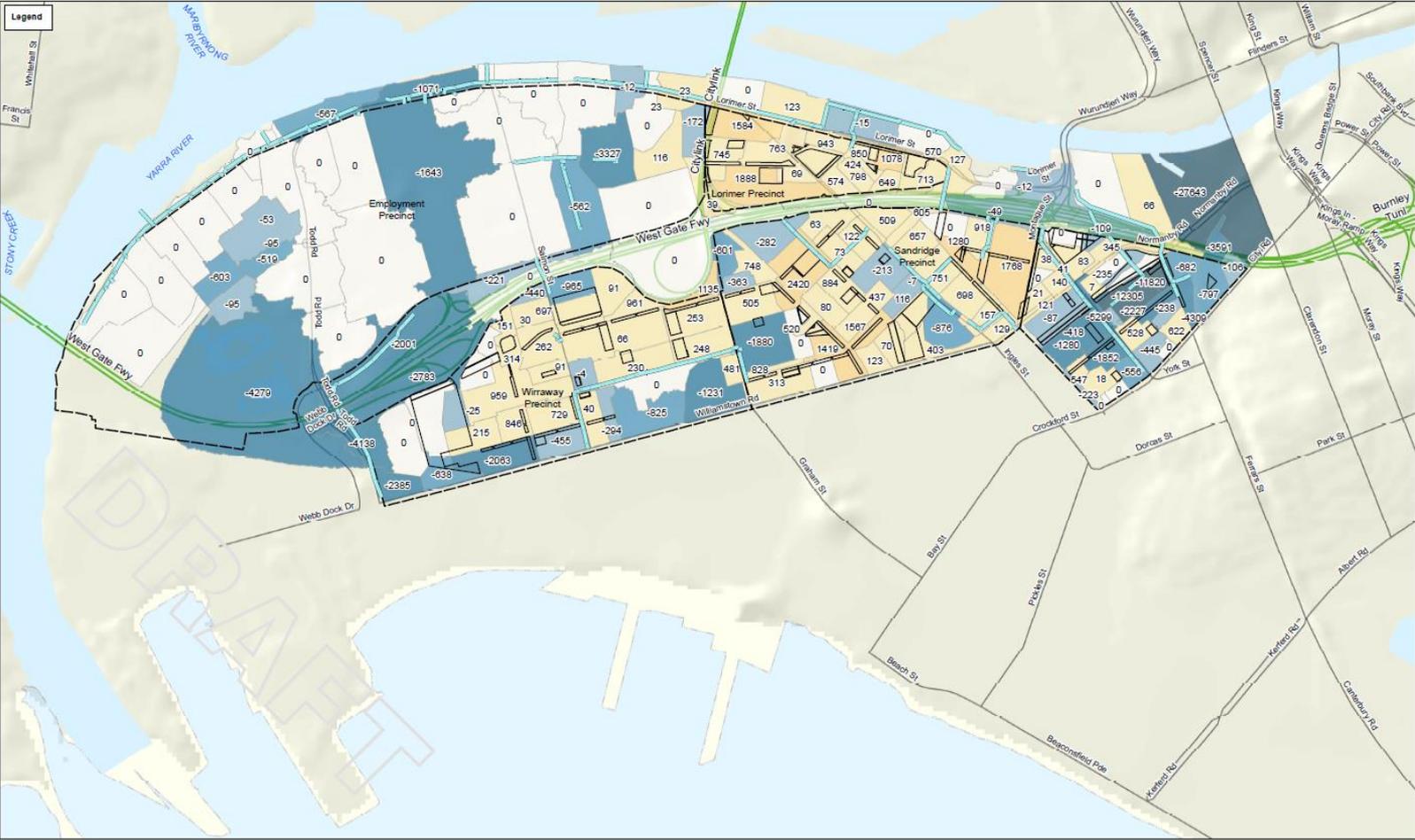
Streetscape storage pit arrangement



Available storage within streetscapes



Streetscape storage balance



Paper Size A3
 0 70 140 280 420 560
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1984
 Grid: GDA 1984 MGA Zone 55



LEGEND		Storage-Spill Volume Difference (20 year) (m3)	
	Proposed Pipes		-999 - -1000
	Precinct Boundaries		-999 - -500
			-499 - -1
			0 - 1
			2 - 1000
			1001 - 2500
			Proposed Open Space
			-27643 - -6000



MELBOURNE WATER
 FISHERMANS BEND WATER SENSITIVE DRAINAGE & FLOOD STRATEGY

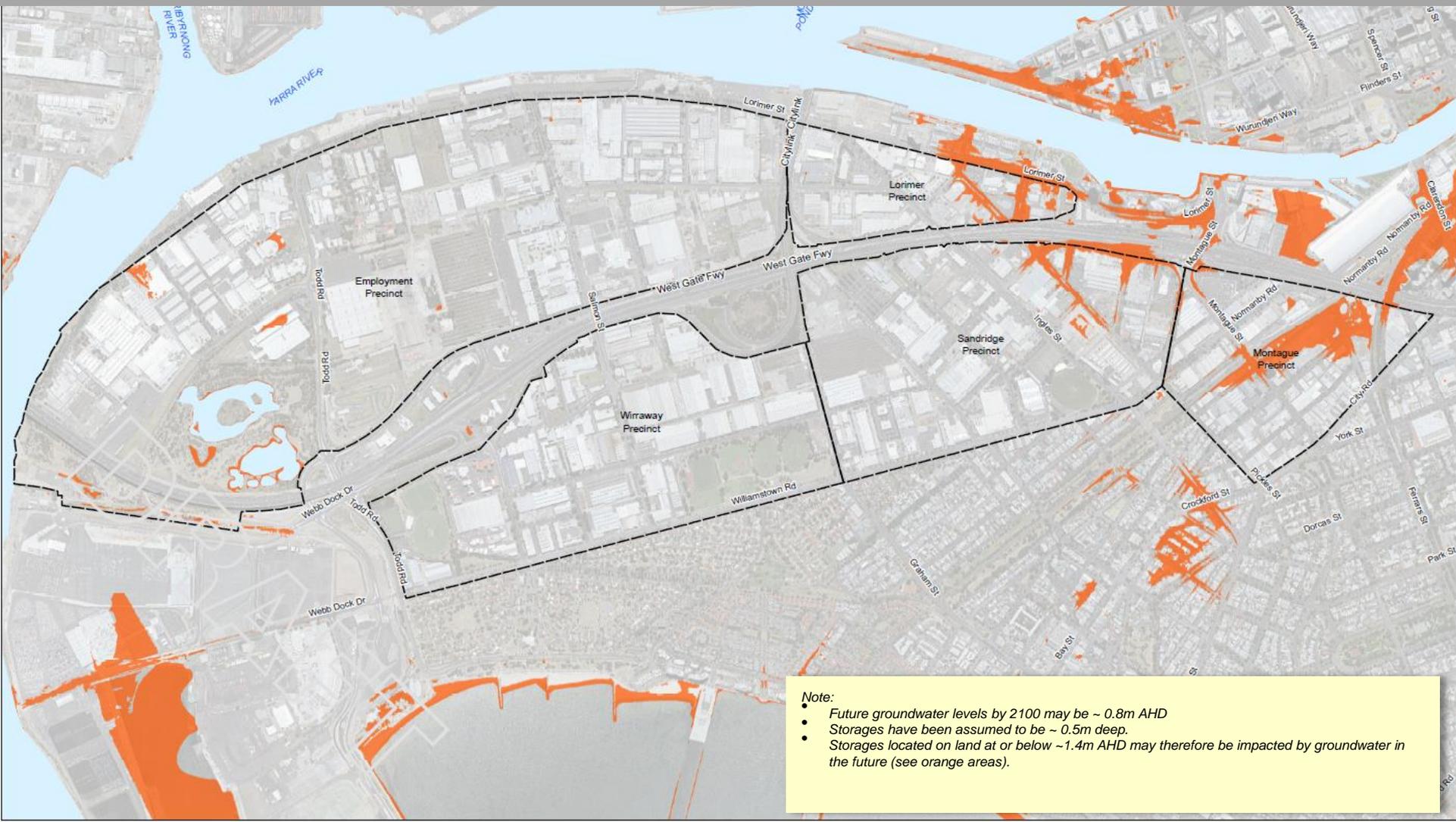
Street storage volume deficits for
 20-year ARI level of service

Job Number 31-36555
 Revision D
 Date 06/12/2018

G:\130955\GIS\Map\Working\3136555_Fishermans_Bend_A3L.mxd
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 Date Issue: 06/12/2018; Melbourne Water; LGAR; Precinct Boundaries, 2018. Created by: SPL/ard



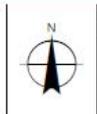
Groundwater conditions and climate change



Note:

- Future groundwater levels by 2100 may be ~ 0.8m AHD
- Storages have been assumed to be ~ 0.5m deep.
- Storages located on land at or below ~1.4m AHD may therefore be impacted by groundwater in the future (see orange areas).

Paper Size A3
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 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 55



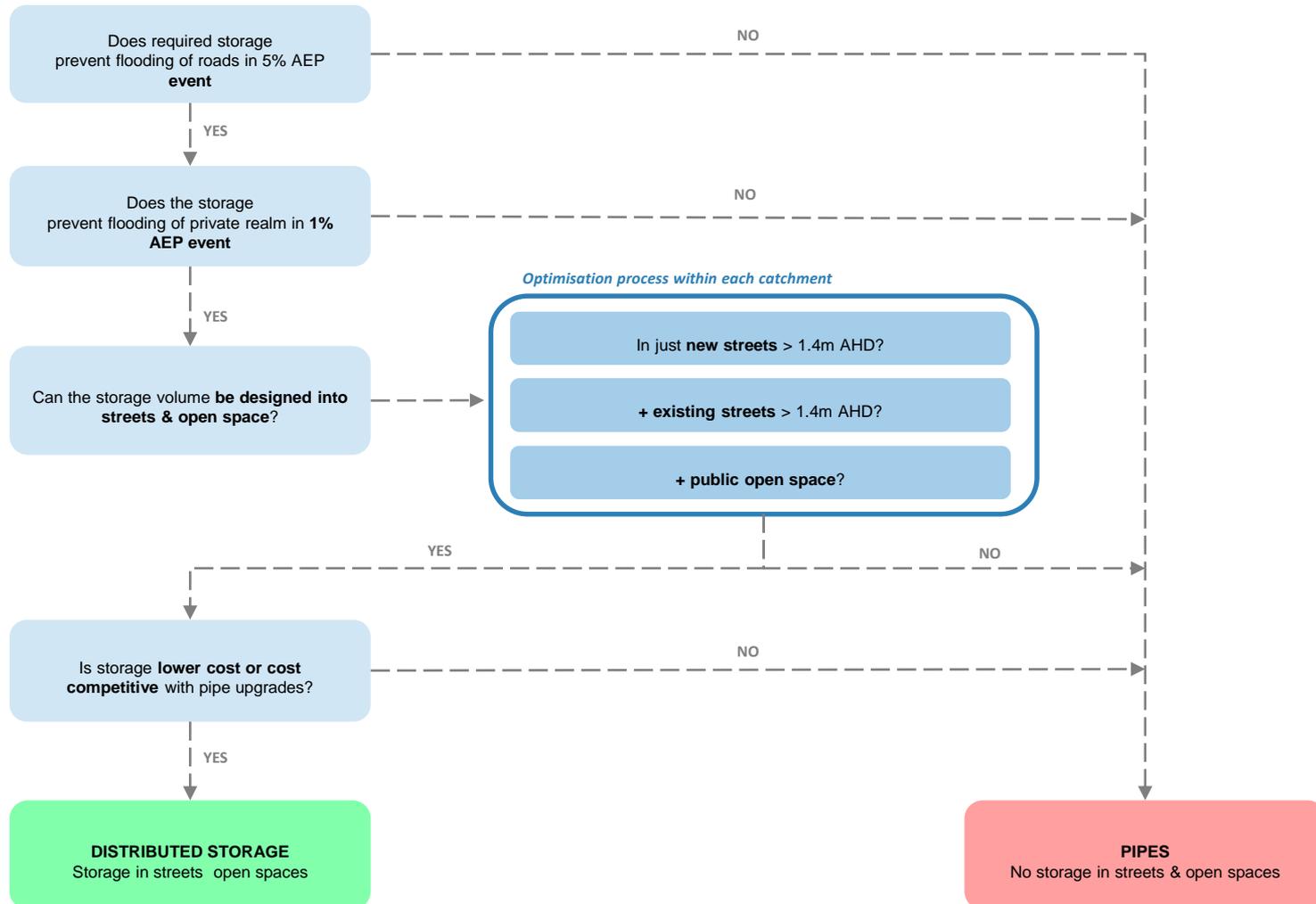
LEGEND
 - - - Precinct Boundaries
 Surface Elevation
 >1.4m AHD
 <1.4m AHD



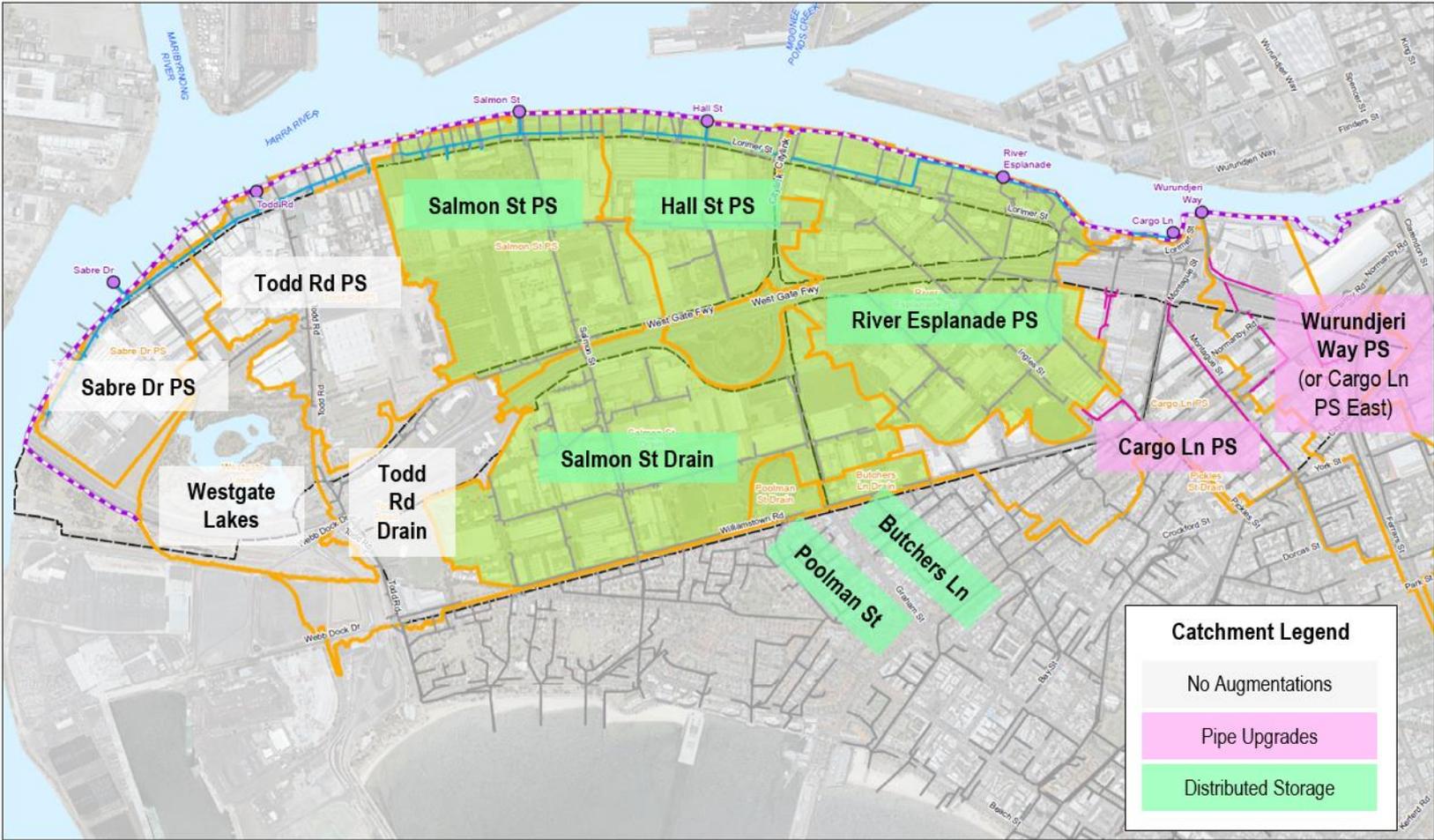
MELBOURNE WATER
 FISHERMANS BEND WATER SENSITIVE DRAINAGE & FLOOD STRATEGY
 Land Area Impact by
 Future Groundwater

Job Number 31-36555
 Revision A
 Date 06/12/2018

Catchment based decision framework



Hybrid drainage strategy



Further work

- Precinct design
- Implementation of the strategy
- Permissible uses for buildings in areas of flood risk
- Regional considerations, in particular with regards to climate change and sea level rise



Questions?



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