

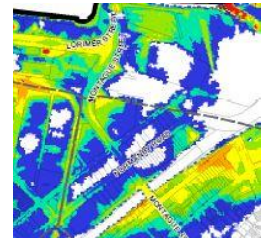
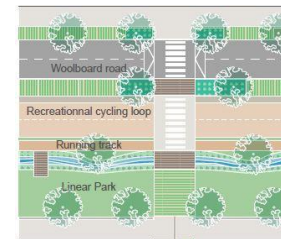


# Fishermans Bend

## Water sensitive drainage and flood management strategy

**Sam Innes** | City of Port Phillip

**Philip Joyce** | GHD

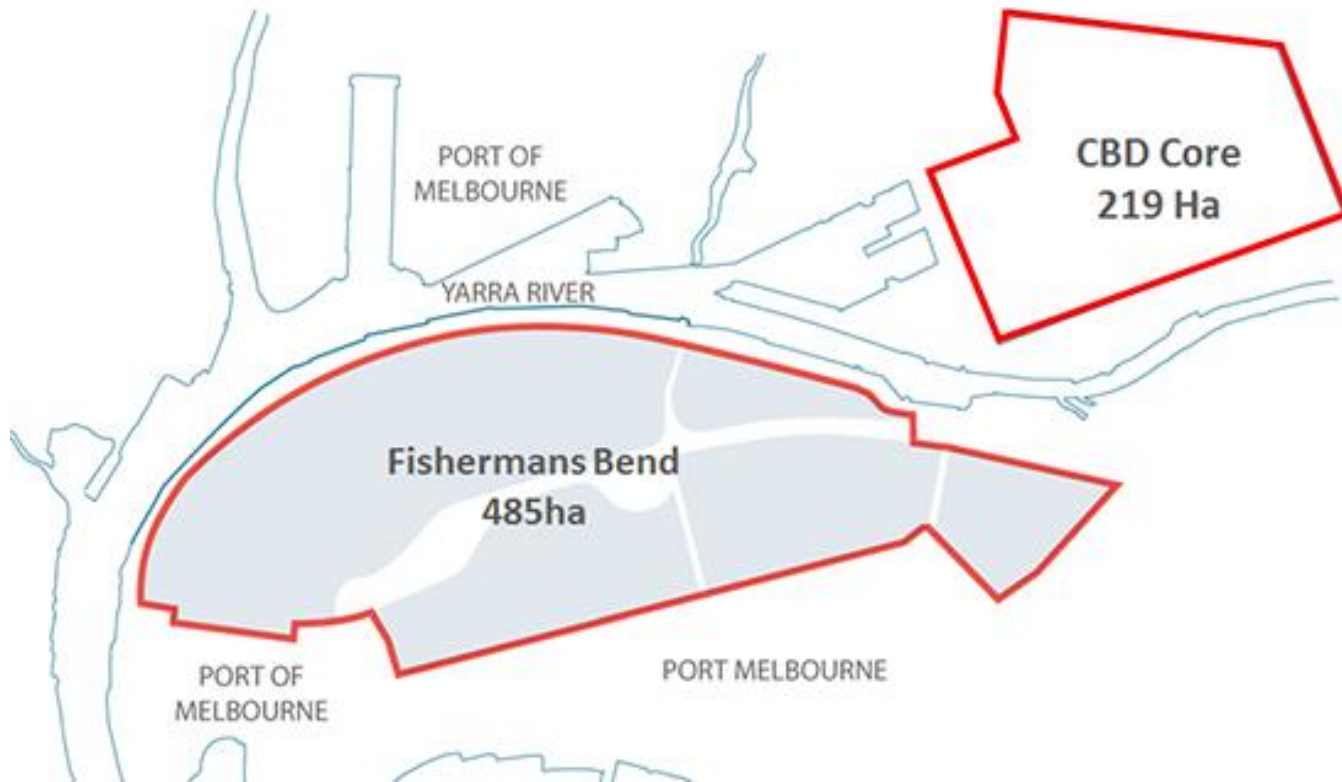


# Content

- 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

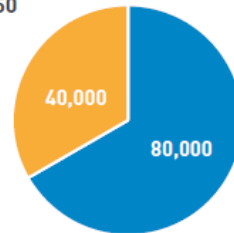
### Fishermans Bend

2016



Fishermans Bend  
(Excl. Employment Precinct)

By 2050

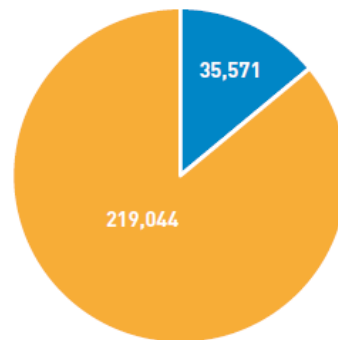


Fishermans Bend  
(Excl. Employment Precinct)

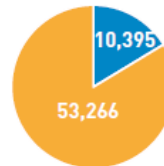
Jobs  
Residents

### Melbourne inner city precincts

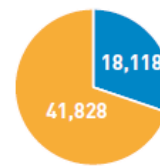
2016



Hoddle Grid  
208 hectares

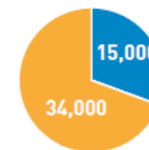


Docklands  
190 hectares



Southbank  
170 hectares

2035



Arden Central  
(Draft Vision)  
56 hectares

Source: Fishermans Bend Urban Design Strategy, Hodyl + Co



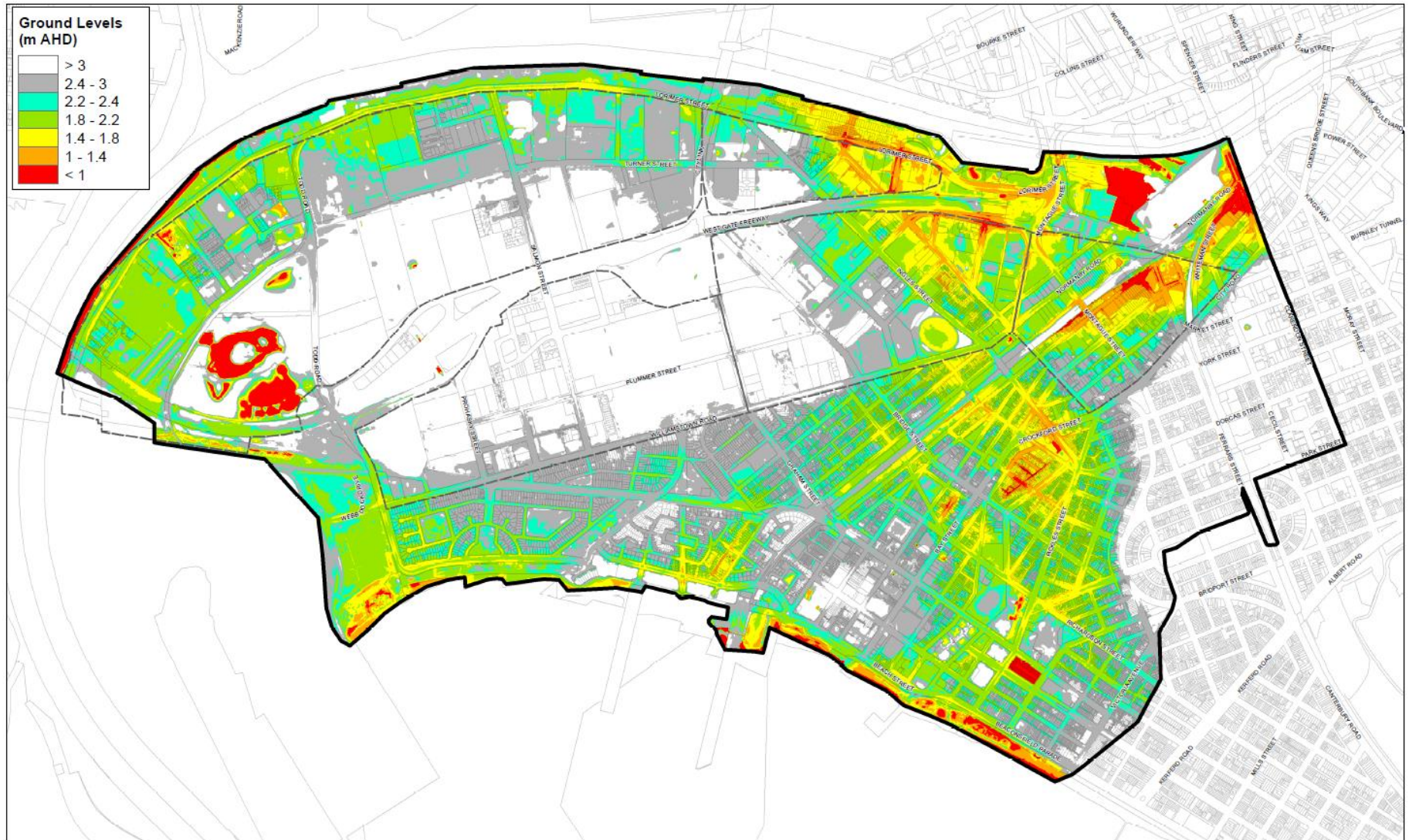
# A lowland swamp with an industrial past...





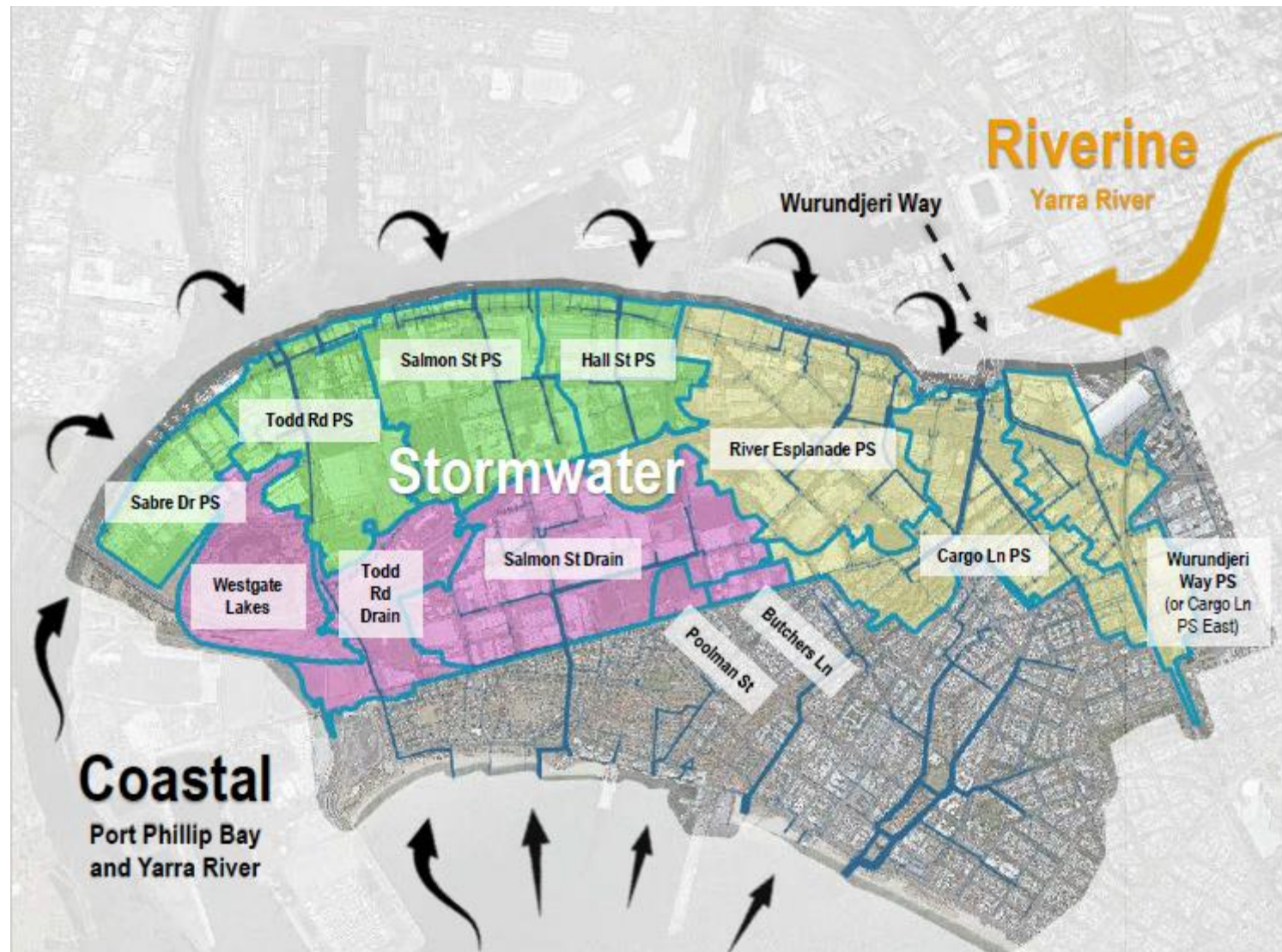
# Challenges

# Low lying area



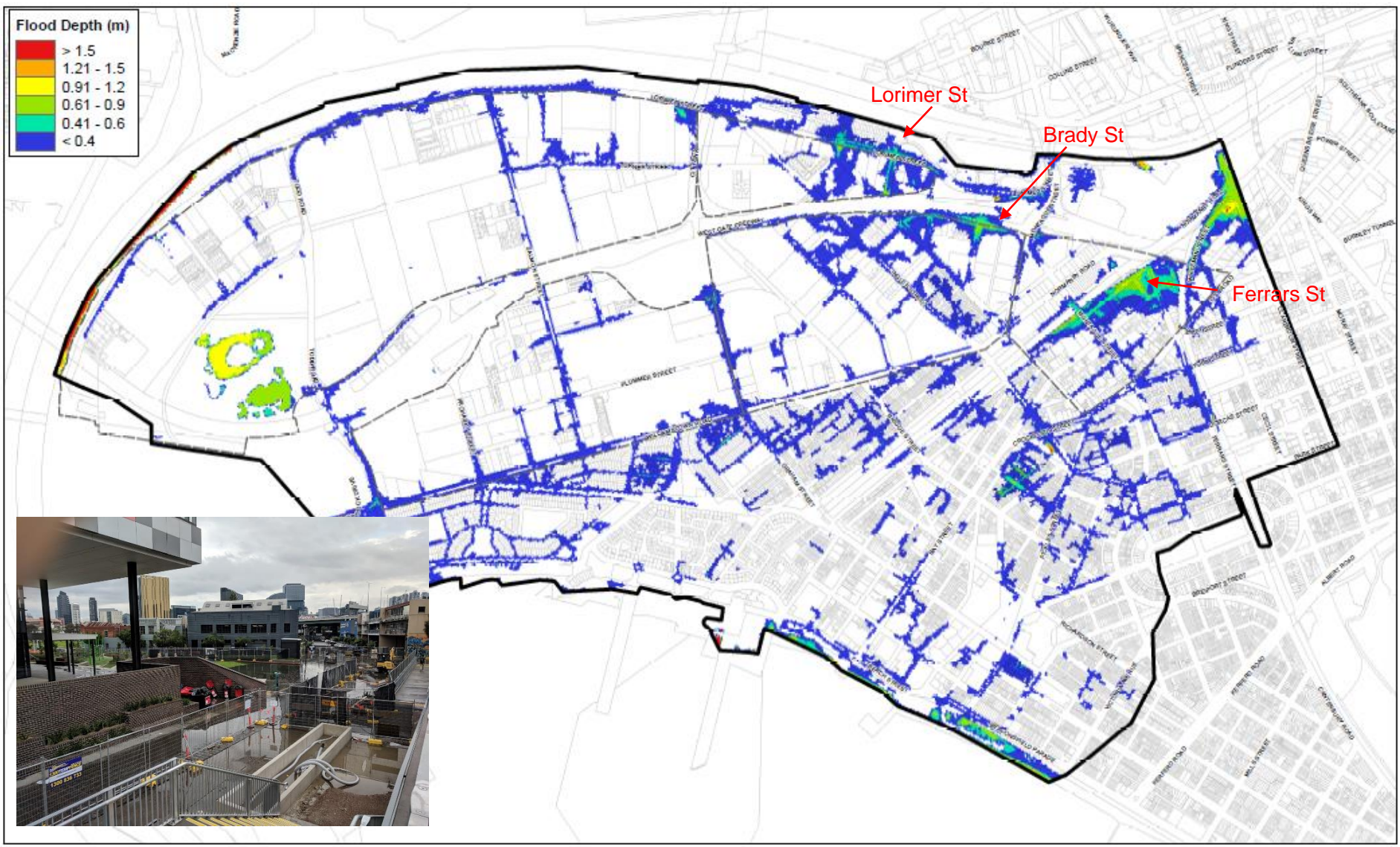


# Sources of flooding



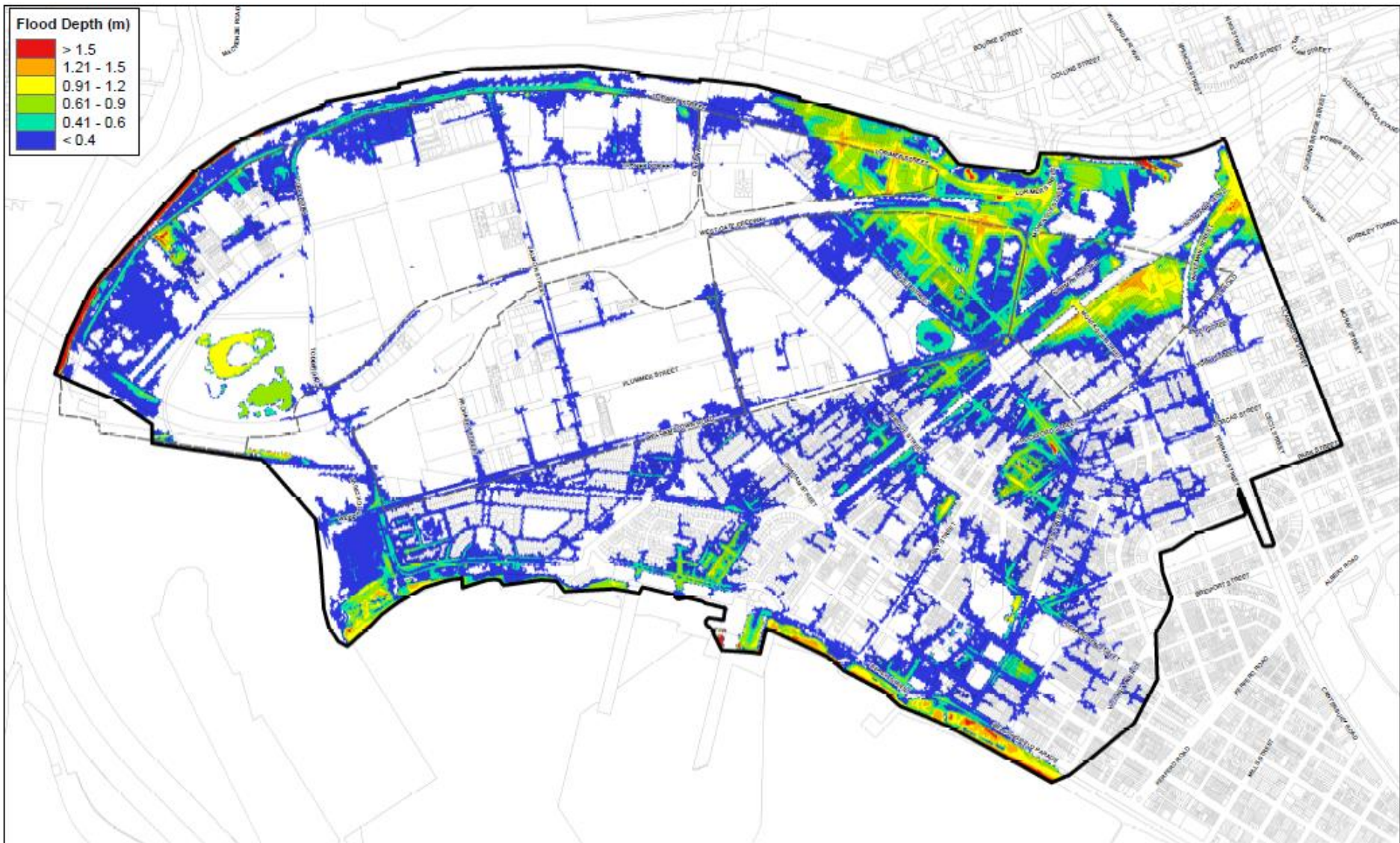


# Flood risk – 1% AEP currently



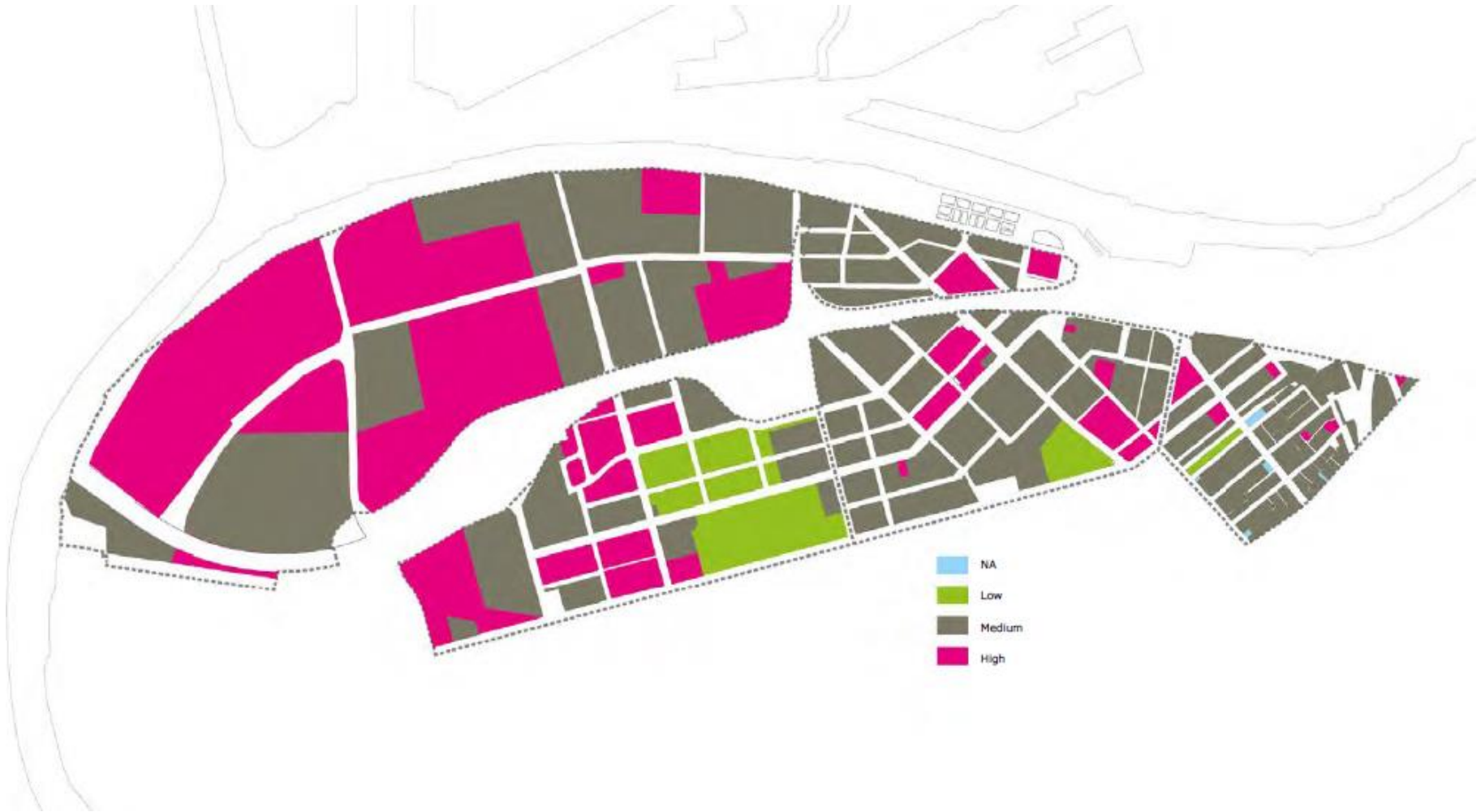


# Flood risk – 1% AEP in 2100 with climate change





# Ground contamination



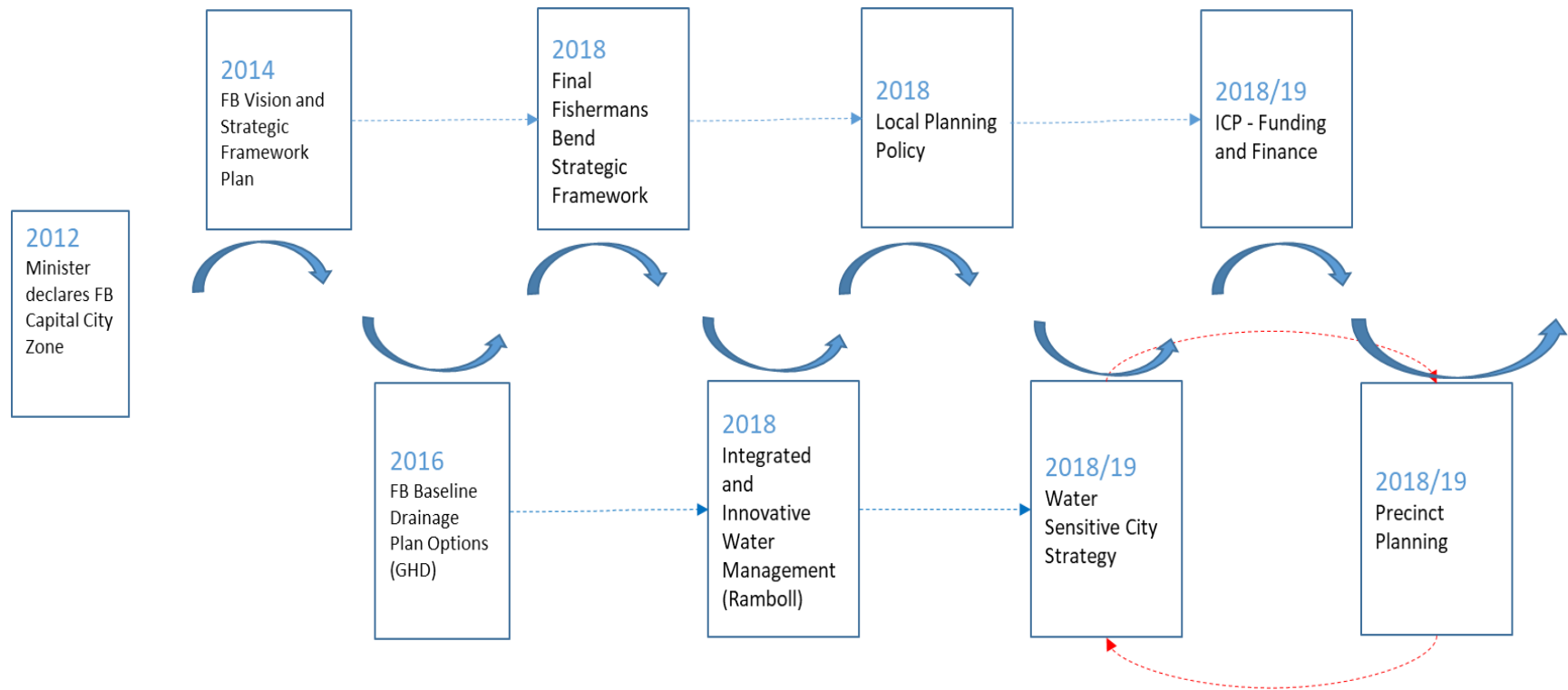
# Groundwater



# **Development of the strategy - place making**



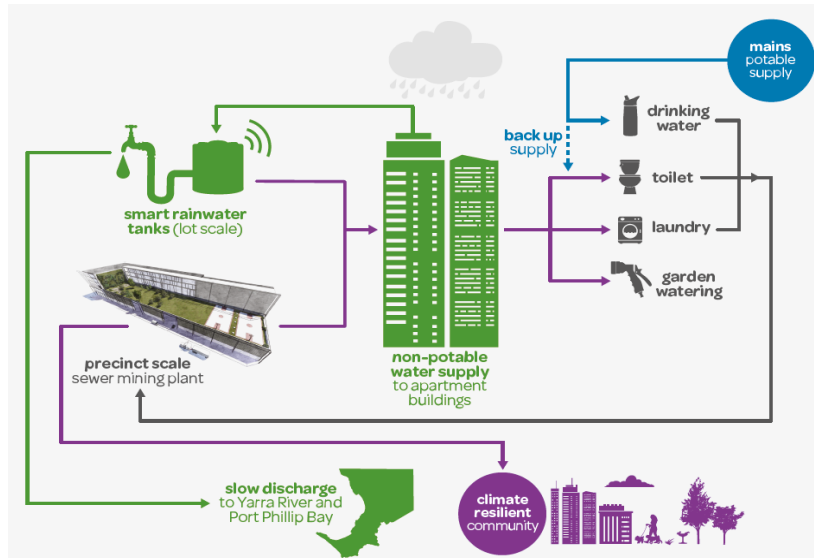
# Water Planning meets Strategic Planning



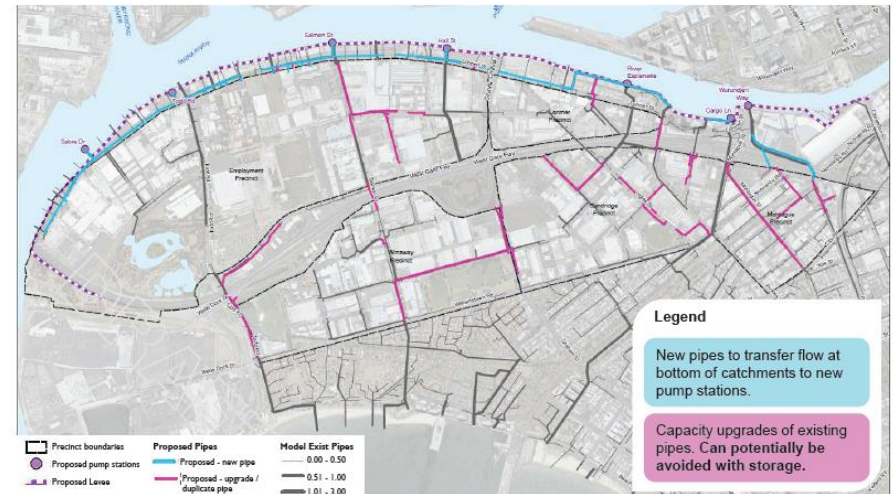
A water sensitive  
community

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

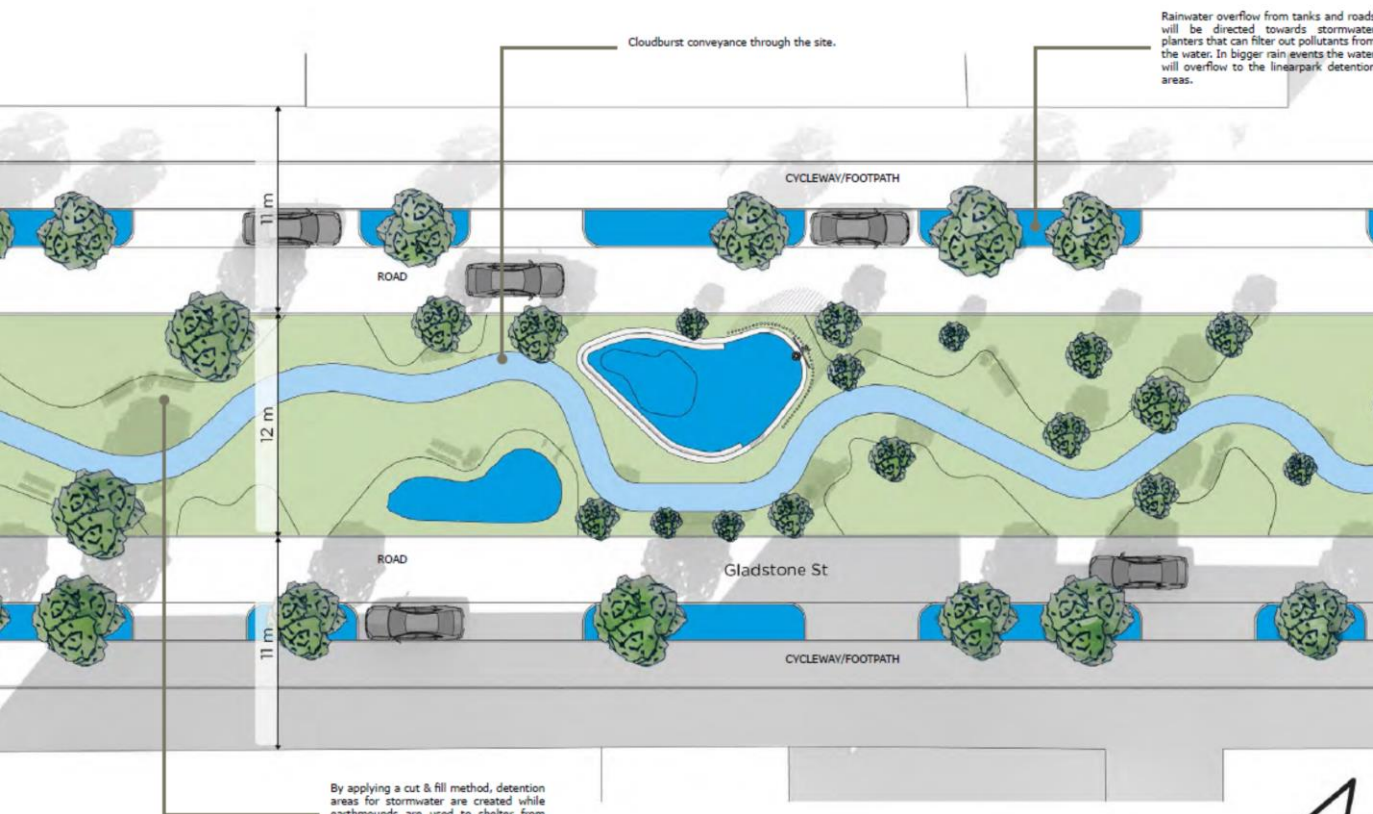
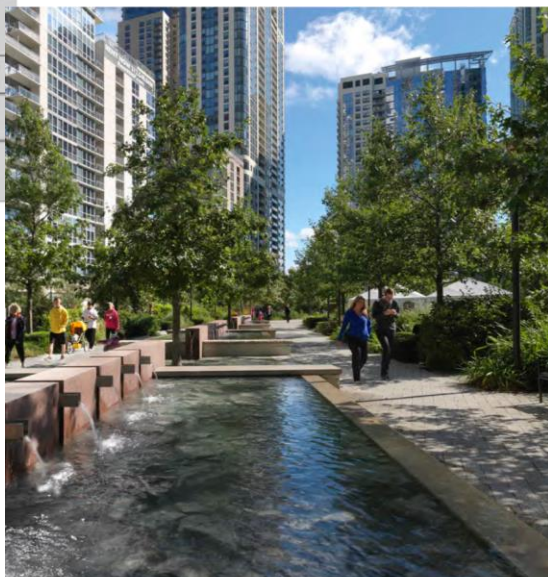


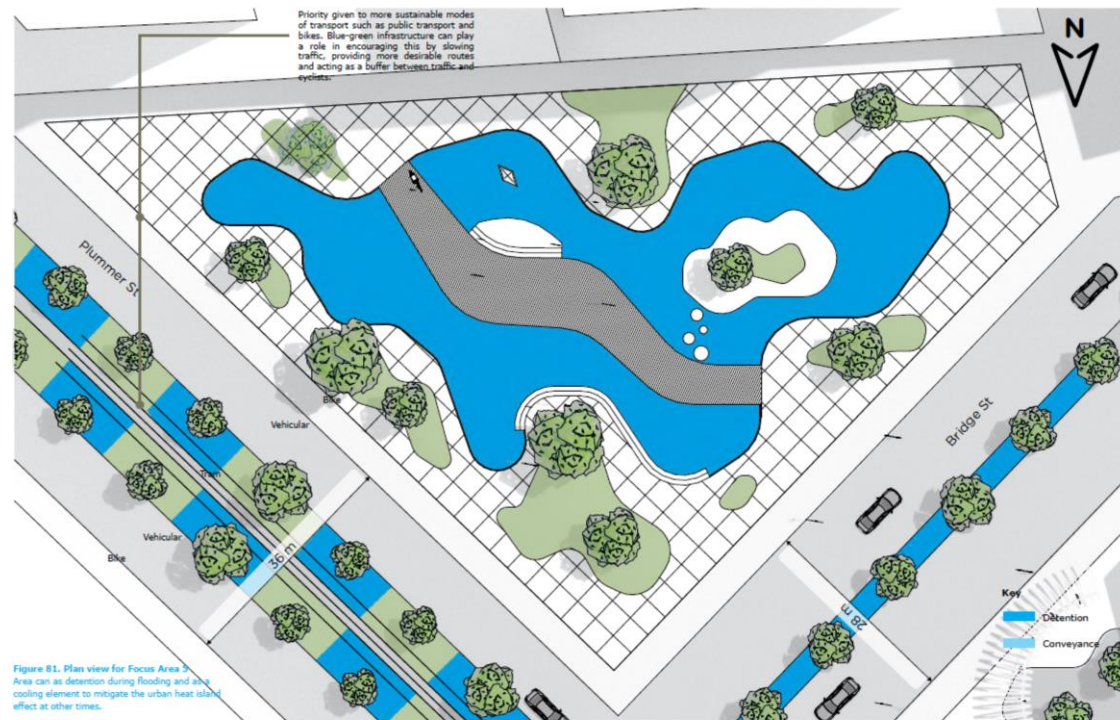
Figure 77. Plan section of Focus Area 4  
Flood management in a cloudburst boulevard.

Ramboll 2016

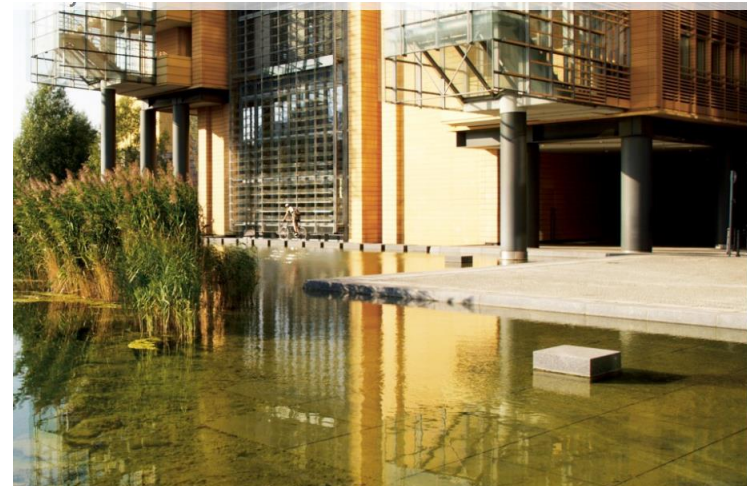




# The Water Plaza



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

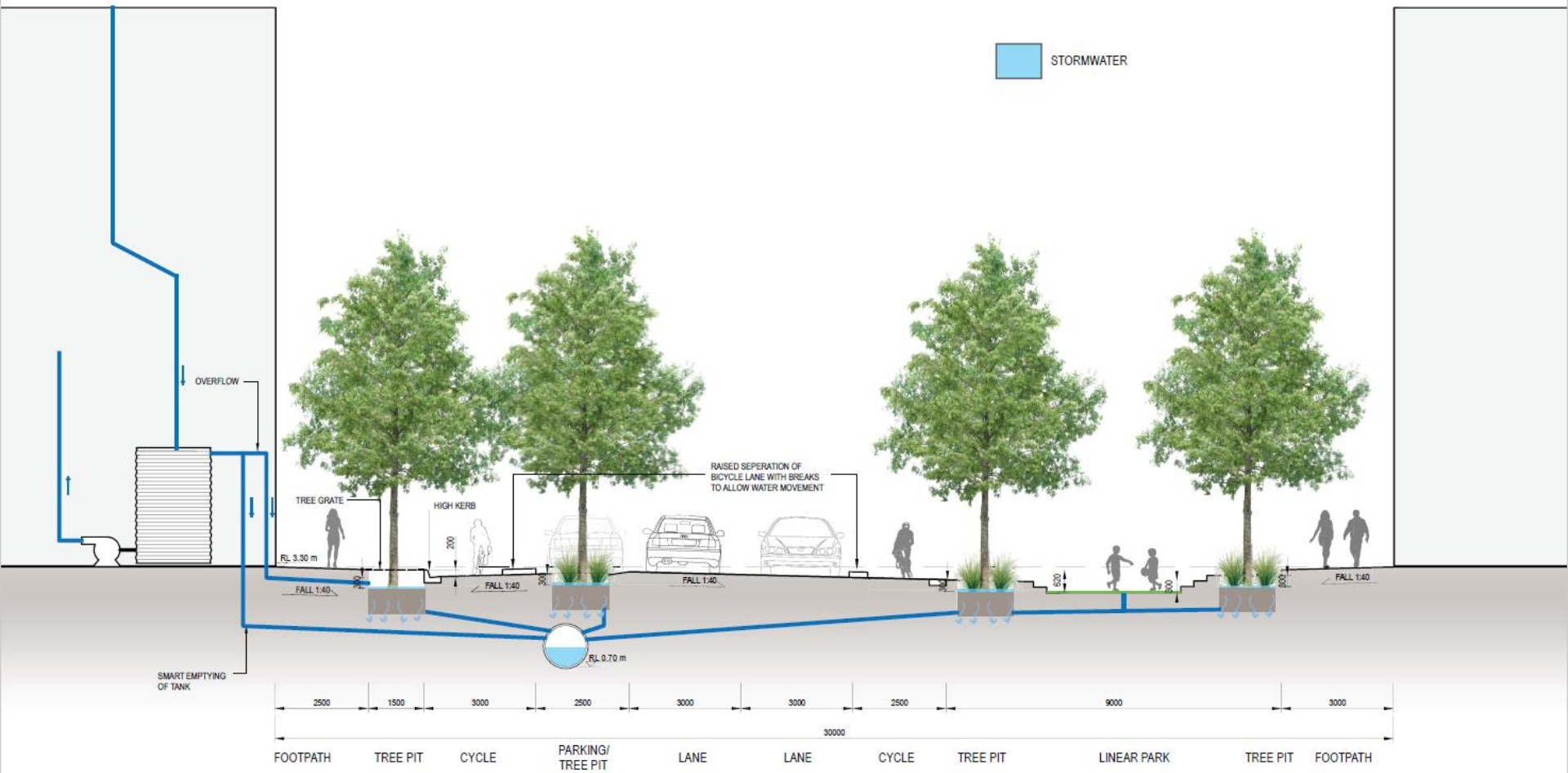
All surfaces including roads and the public realm must remain free of flooding in any event up to a 5% AEP flood event.

## 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

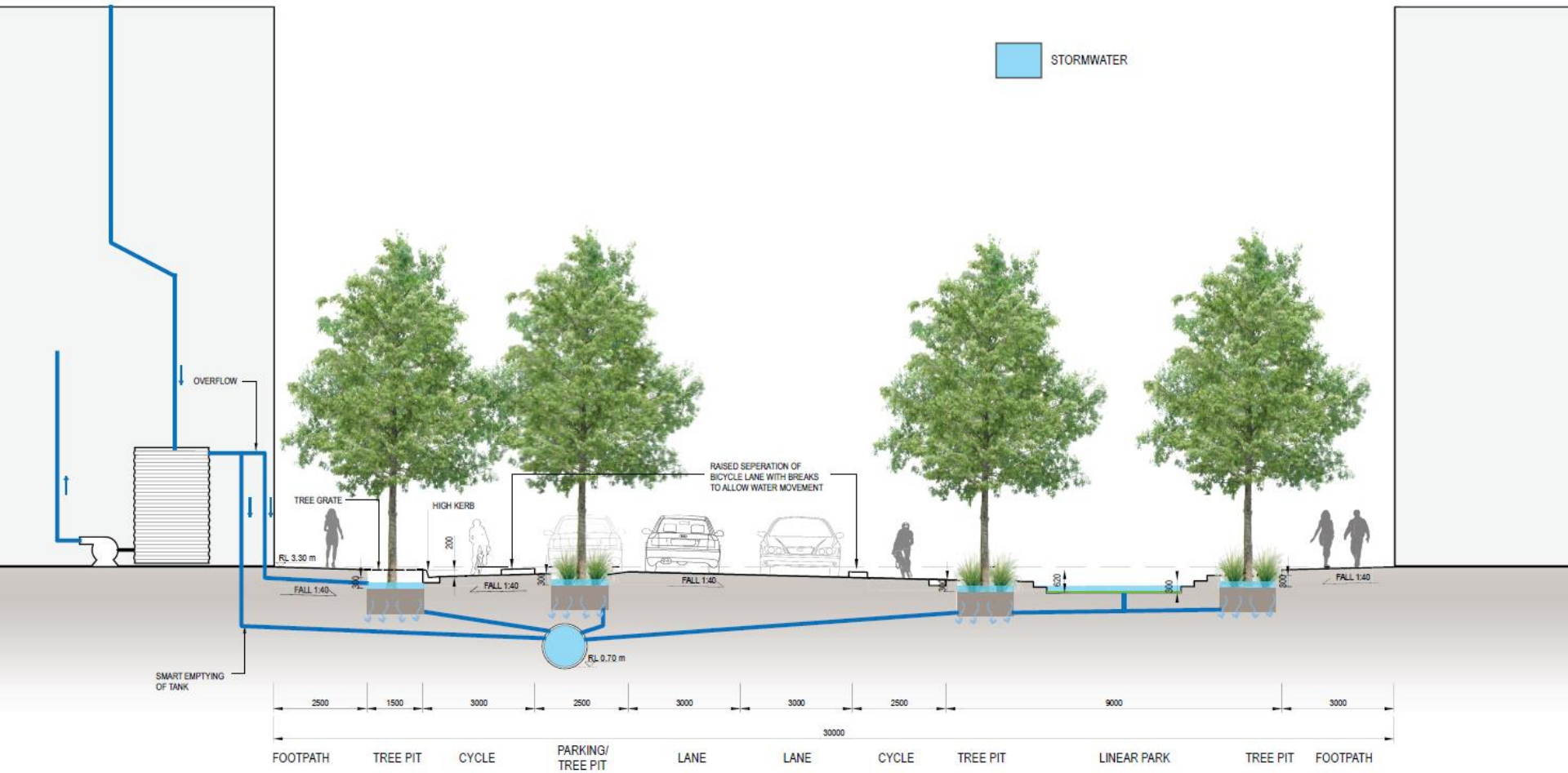


TYPICAL STREET SECTION WITH STORAGE  
IN A 5 - YR ARI EVENT

SCALE 1:100 @A3 0 1 2 5 m



# Hybrid in 10 yr ARI event

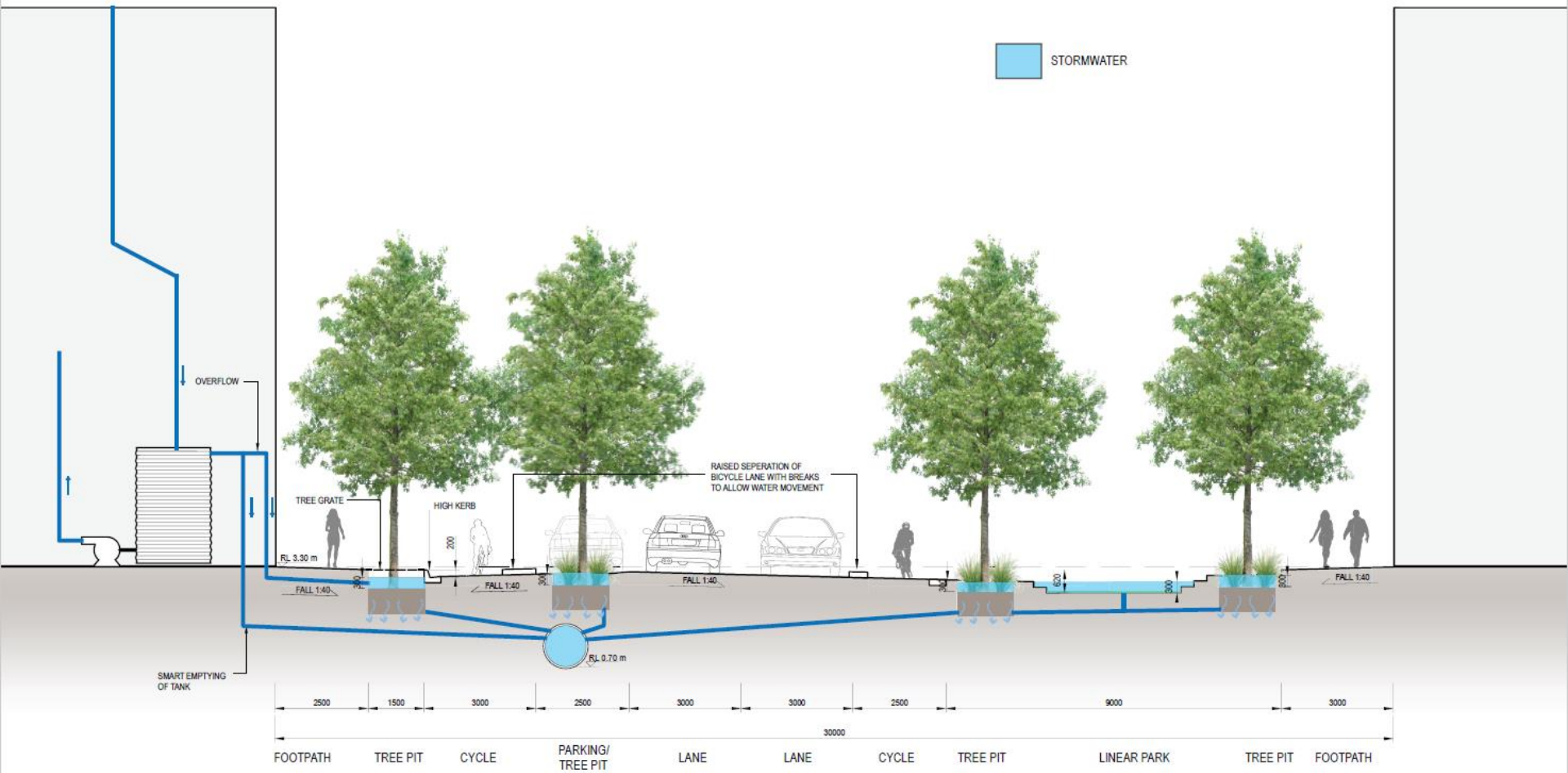


TYPICAL STREET SECTION WITH STORAGE  
IN A 10 - YR ARI EVENT

SCALE 1:100 @A3 0 1 2 5 m



# Hybrid in 20 yr ARI event

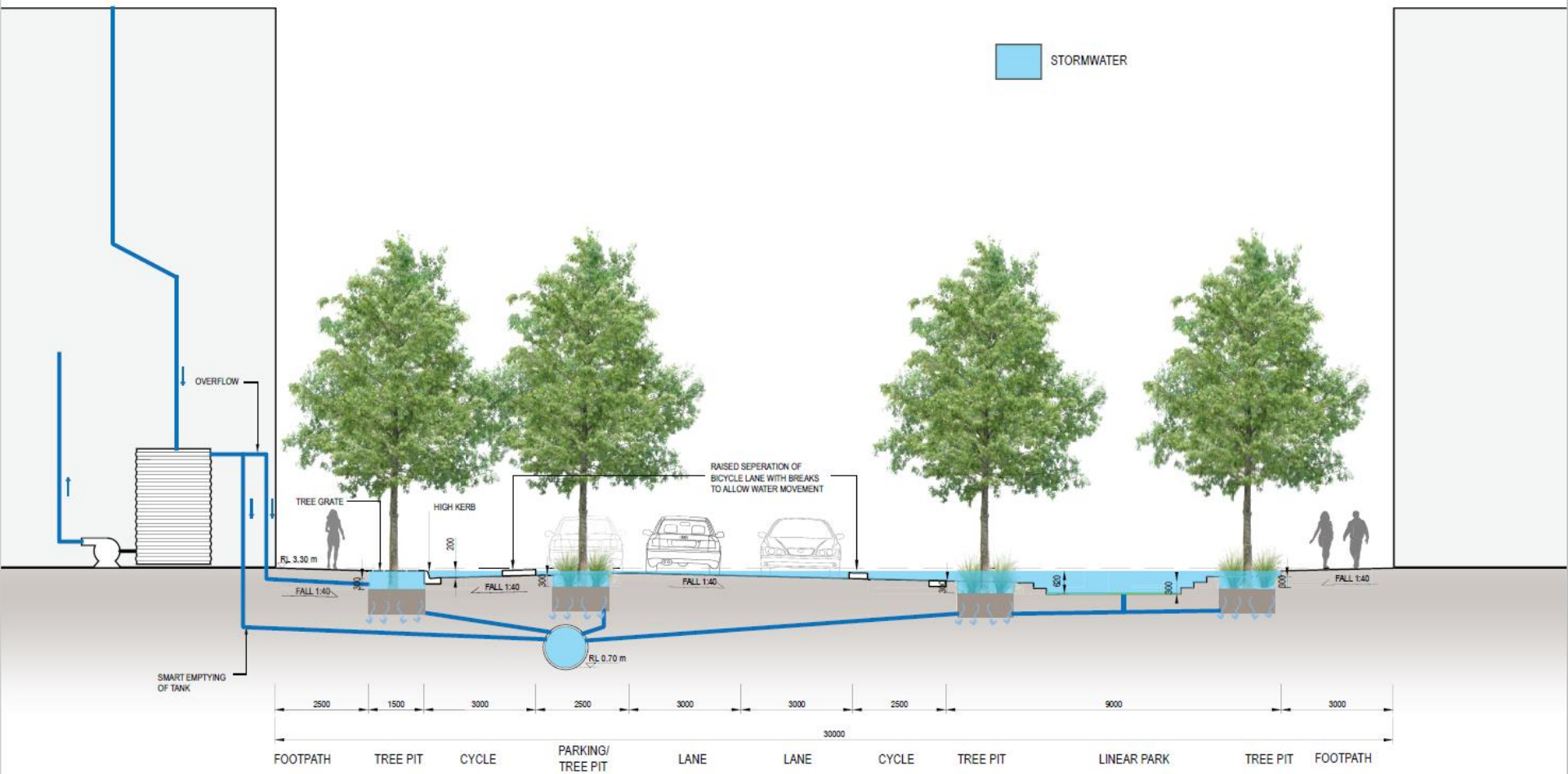


TYPICAL STREET SECTION WITH STORAGE  
IN A 20 - YR ARI EVENT

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

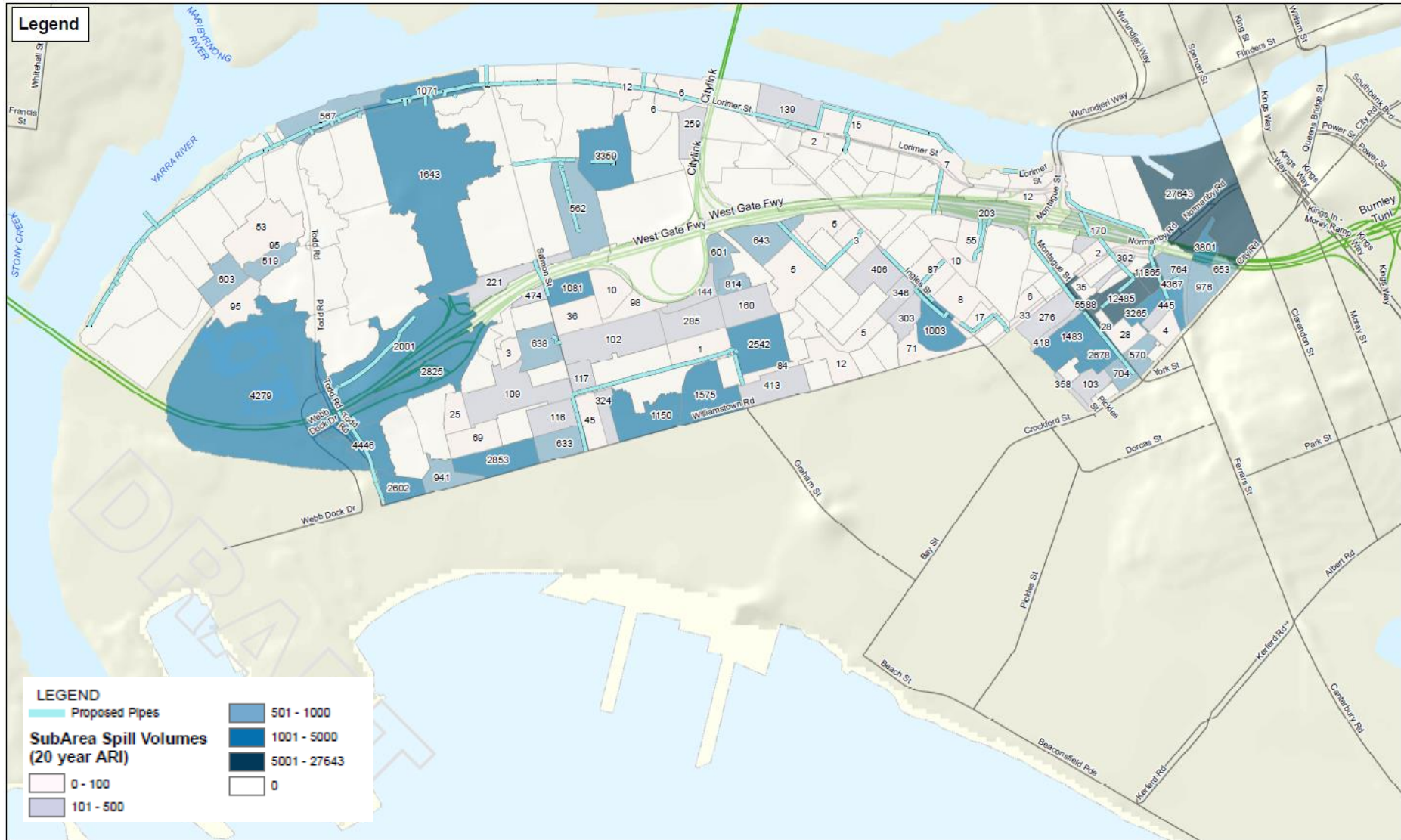
# **Development of the strategy - modelling and analysis**

# Baseline drainage plan

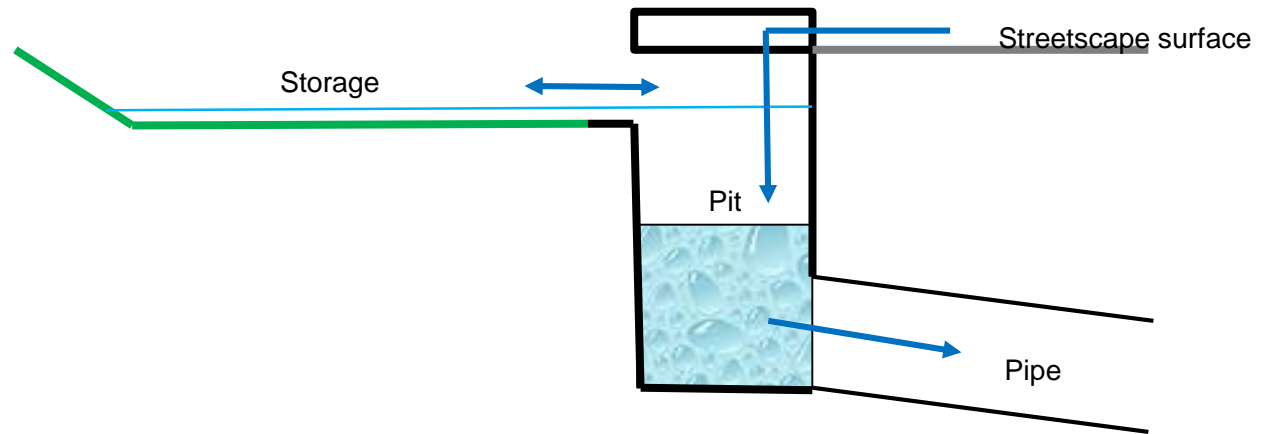
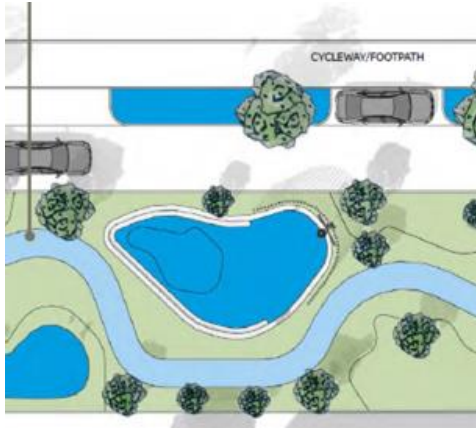




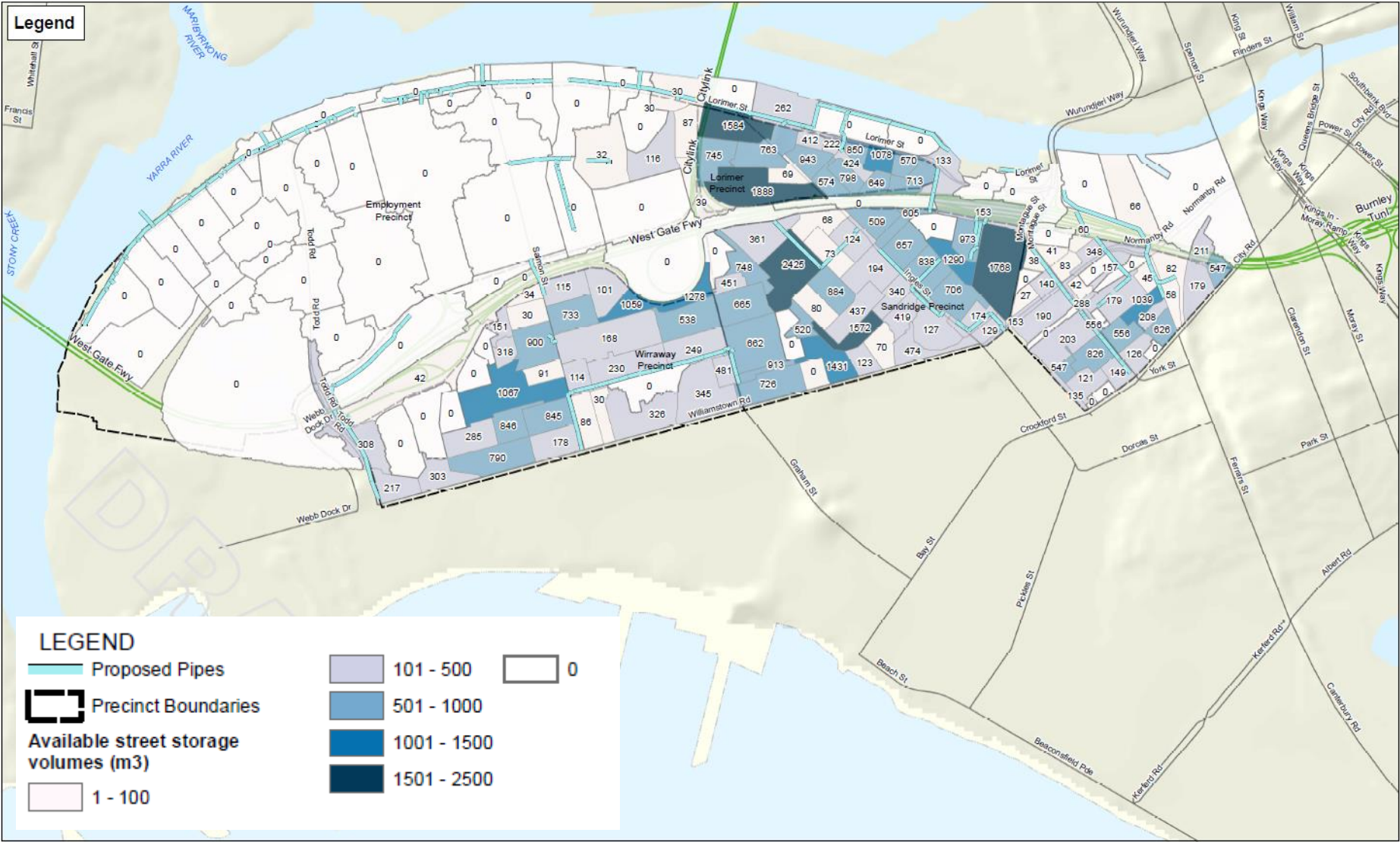
## Required storage to avoid pipe upgrades



# Streetscape storage pit arrangement

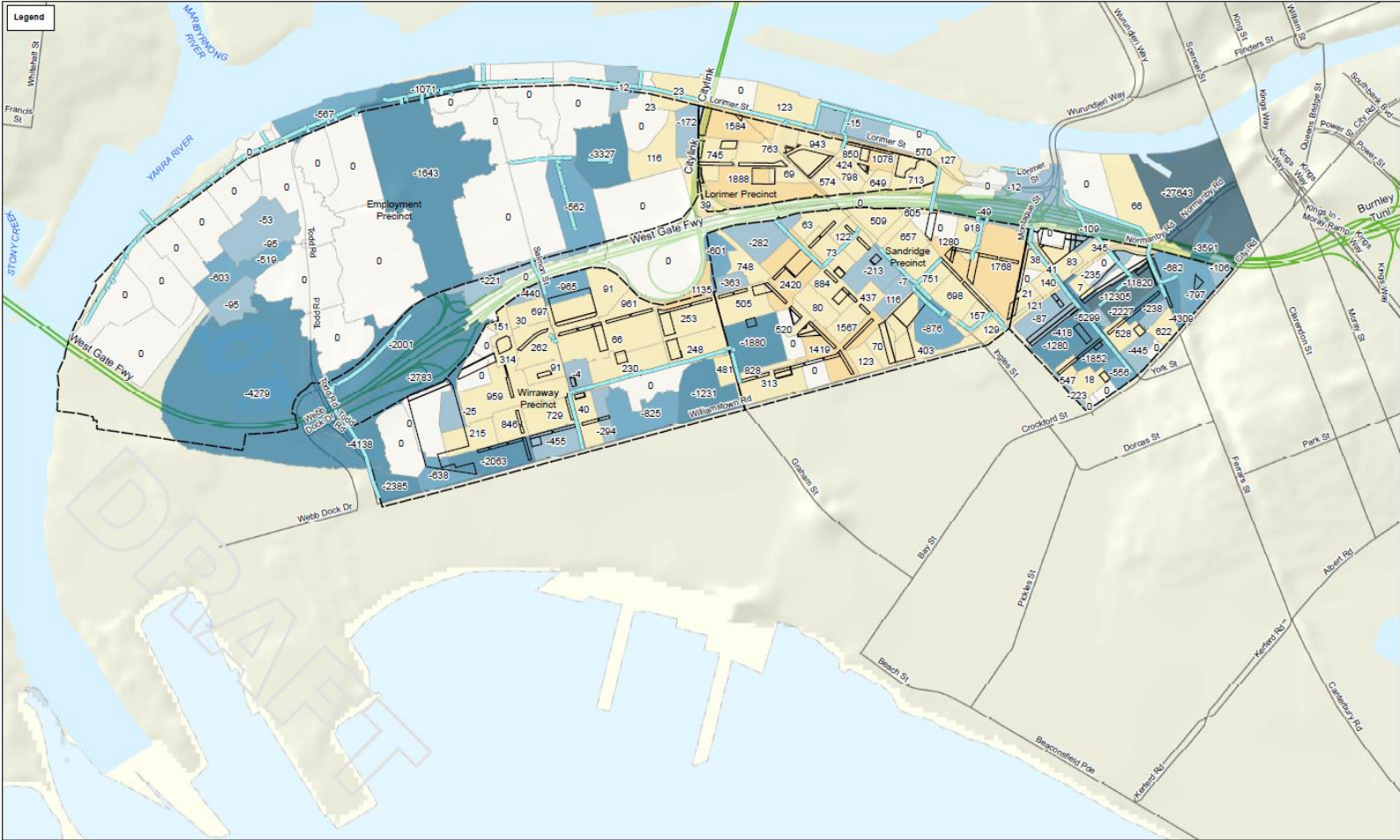


## Available storage within streetscapes





# 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 56

LEGEND

- Proposed Pipes
- Precinct Boundaries

Storage-Spill Volume Difference (20 year) (m3)

-999 - -1000	2 - 1000
-999 - -500	1001 - 2500
-499 - -1	Proposed Open Space
0 - 1	

Difference

-27643 - -6000
----------------

MELBOURNE WATER  
FISHERMANS BEND WATER SENSITIVE DRAINAGE & FLOOD STRATEGY

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

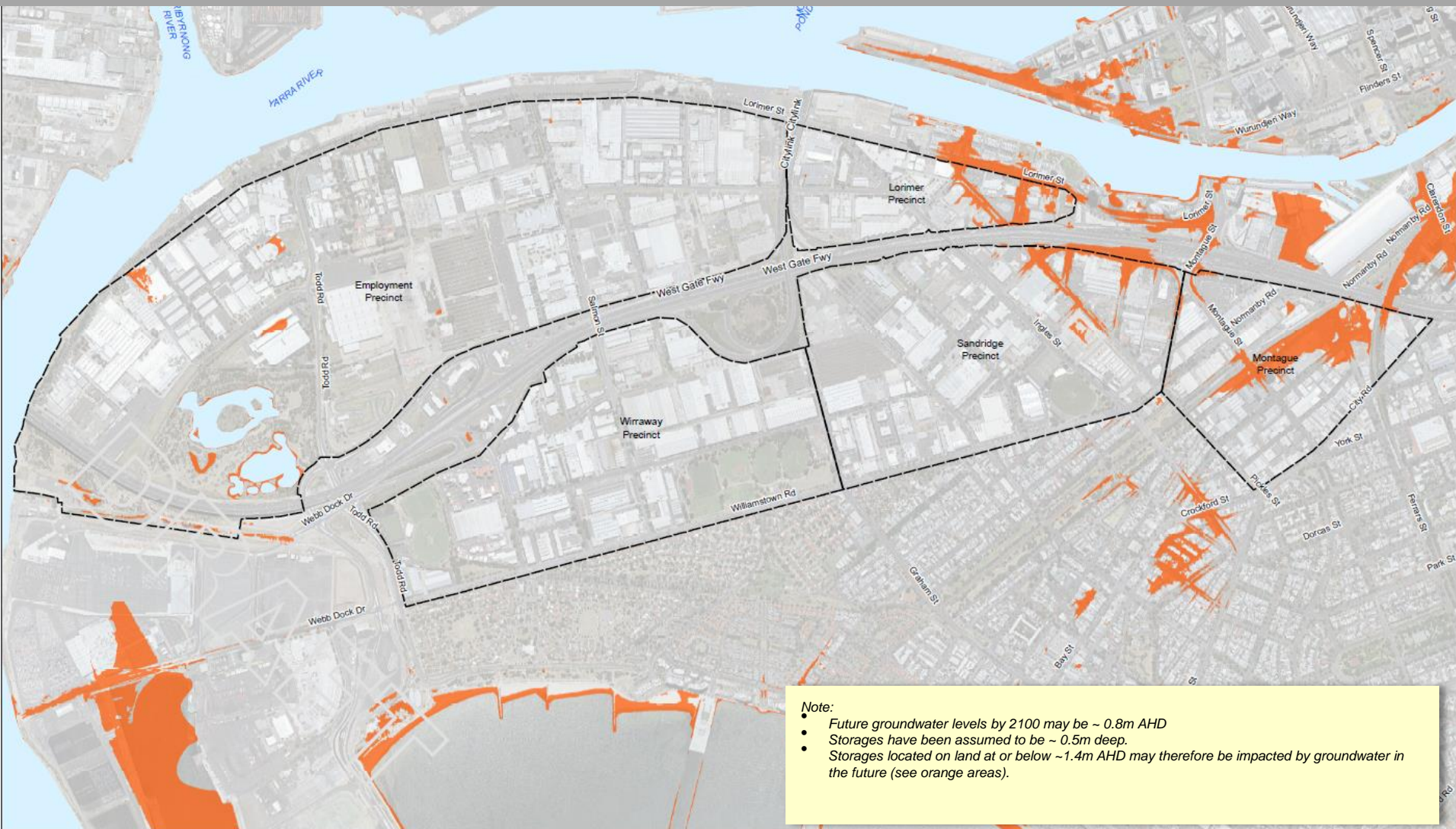
160 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melm@ghd.com W www.ghd.com

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

G:\130855\GIS\Map\Working\130855\_Fishermans\_Bend\_A3.mxd  
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Data source: VicMap, 2017; Melbourne Water; LGAR, Precinct Boundaries, 2018. Created by: SPL/ard



# Groundwater conditions and climate change

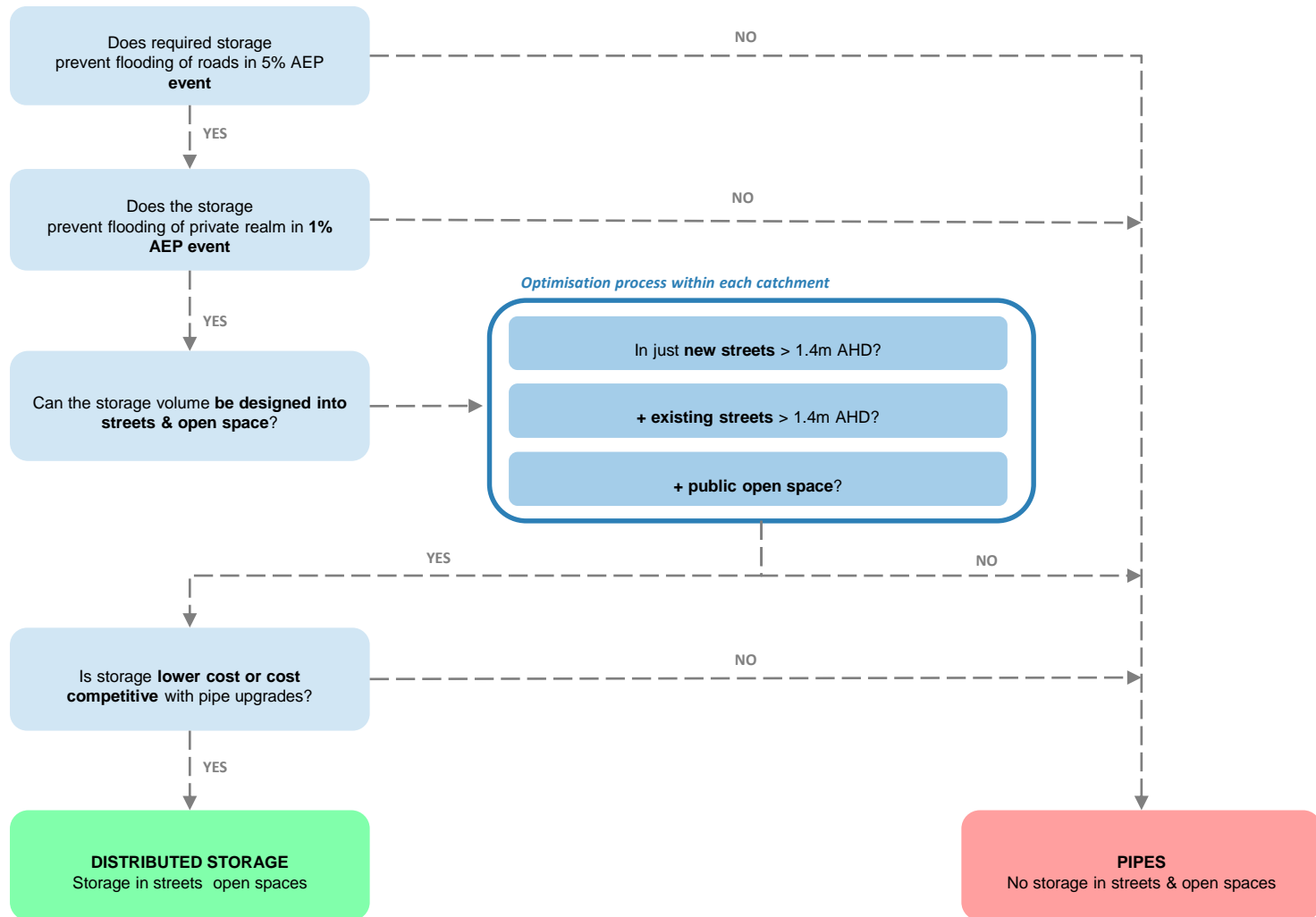


**Note:**

- 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).

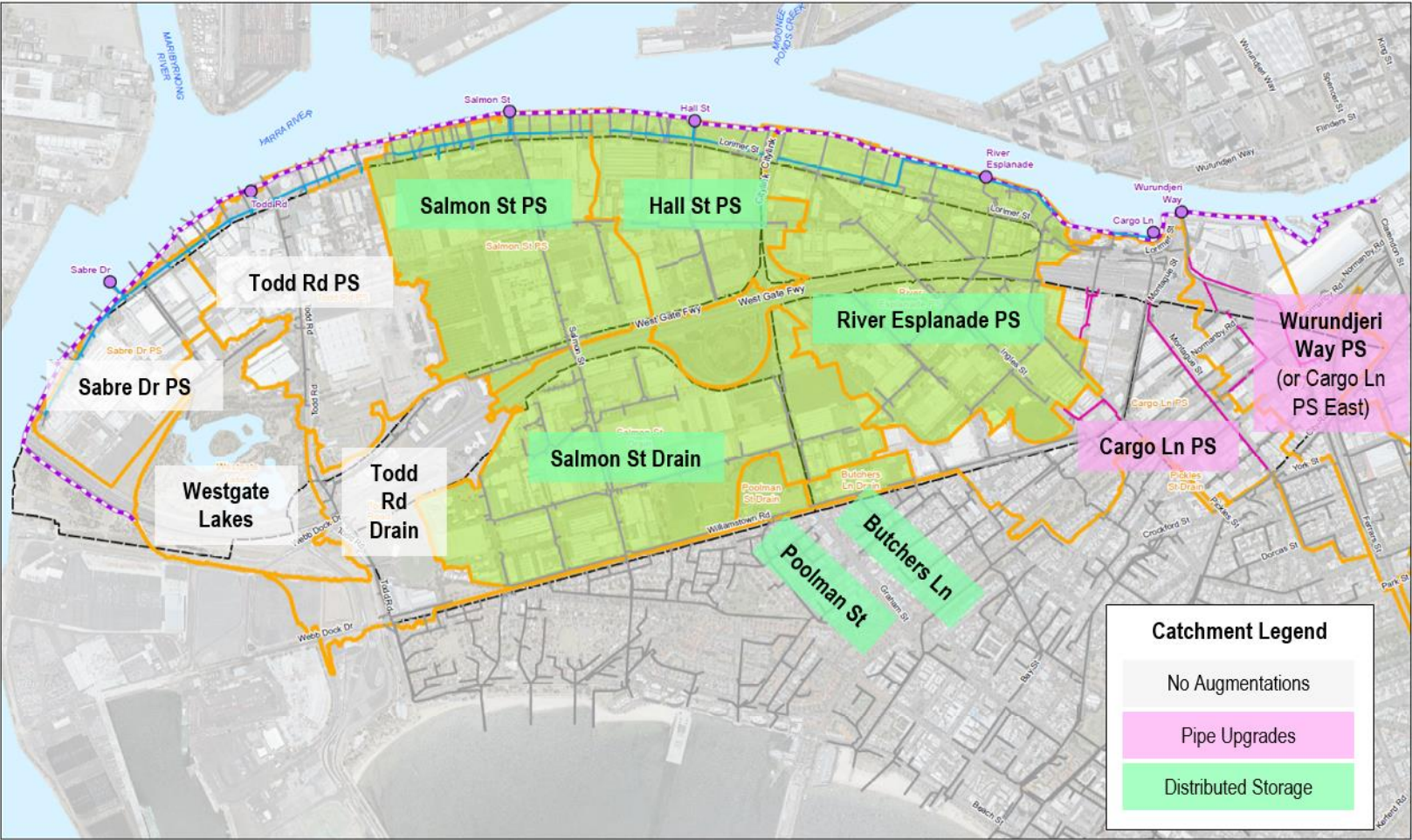


# Catchment based decision framework





# 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?**





**[www.ghd.com](http://www.ghd.com)**