# Pasadena Smart Stormwater

# Our Innovation Journey

From Stormwater Greening to Flood Mitigation with Greening

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# Pasadena Biodiversity Stage 1

## Daylighting Stormwater for greening

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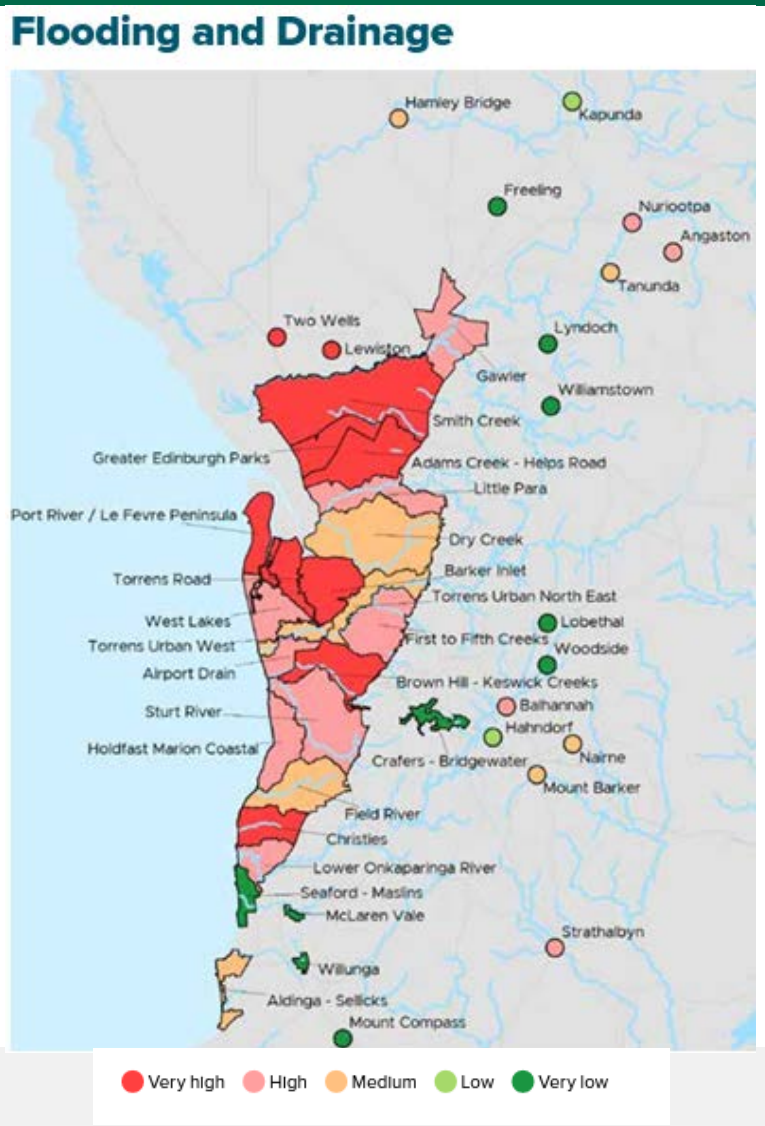
# Daylighting Stormwater - Detention basin

# Pasadena Biodiversity Stage 2

Smart Stormwater

- Flood Mitigation with Greening/Cooling
- Partnered with The University of Adelaide
- Modelling and optimisation complete
- Basis for grant application

# Smart Stormwater – Why?




- Metropolitan Adelaide councils will invest <u>hundreds of millions of dollars</u> in stormwater infrastructure to reduce the potential for flooding

- Traditional Method - increase flow capacity with bigger pits and pipes

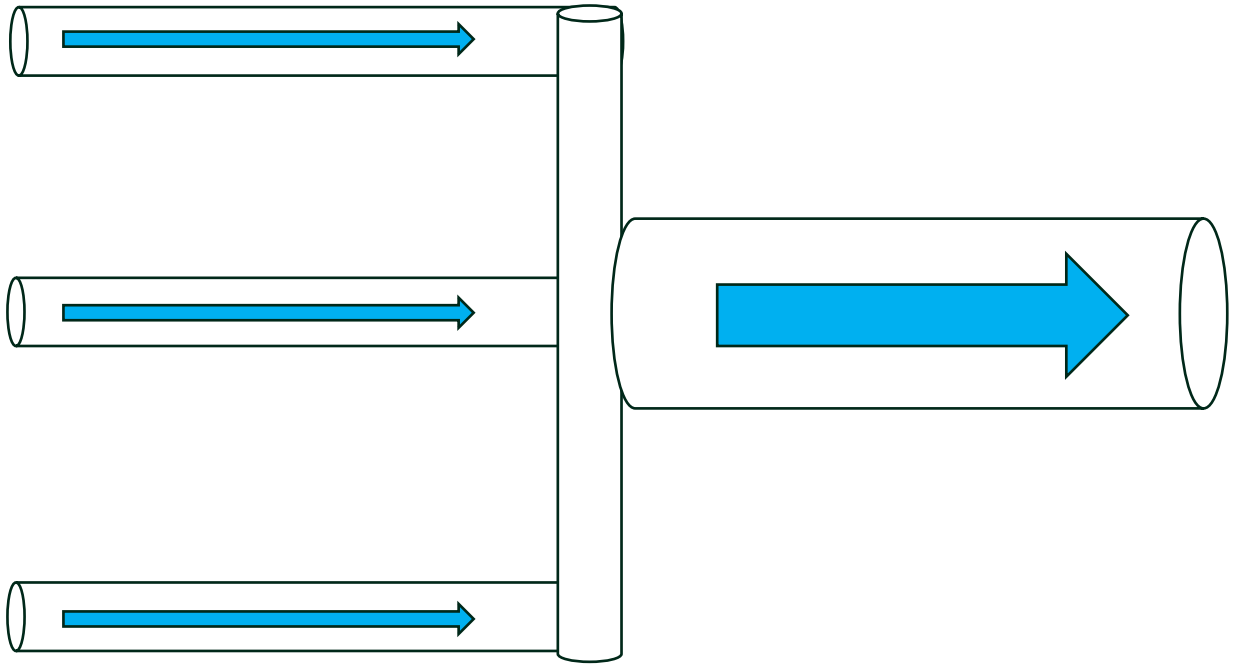
Image - Stormwater Management Planning Priorities for South Australia 2022, Stormwater Management Authority

# Smart Stormwater

## Reduce flows, rather than increase capacity

# The problem

- **Flows from each sub-catchment uncontrolled**
- **Results in flows reaching downstream network at the same time**
- **Result is large peak in flows**

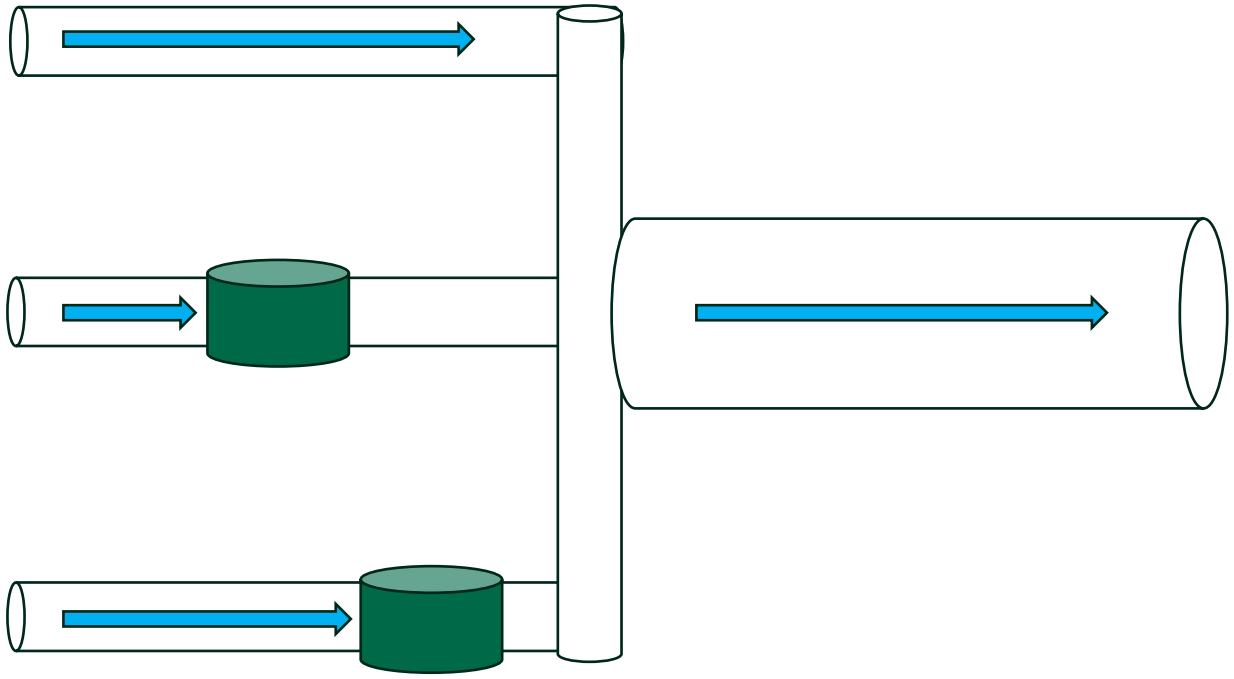


# The opportunity

## Delay some of the flows

**Introduce Storages**

- **above or underground to delay flows**
- **Offset peak flows from each system to reduce the downstream peak**



# Innovative storage options

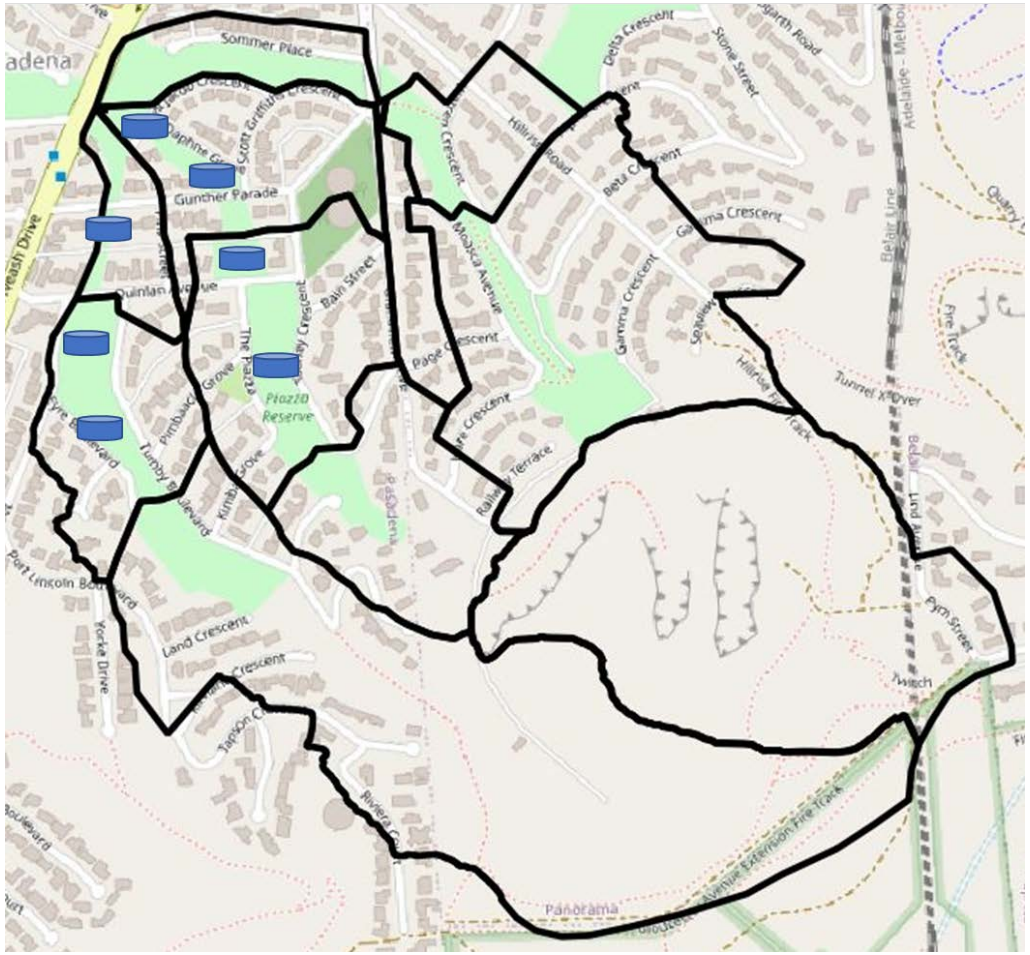
## Smart Design

- Location and Size of storages
- Model the catchment and use machine learning

## Smart Control

- Control the release of water from storages
- Control system to vary the outlet size and flow rate
- Machine learning measures rainfall, inflows, storage levels to decide release opening size

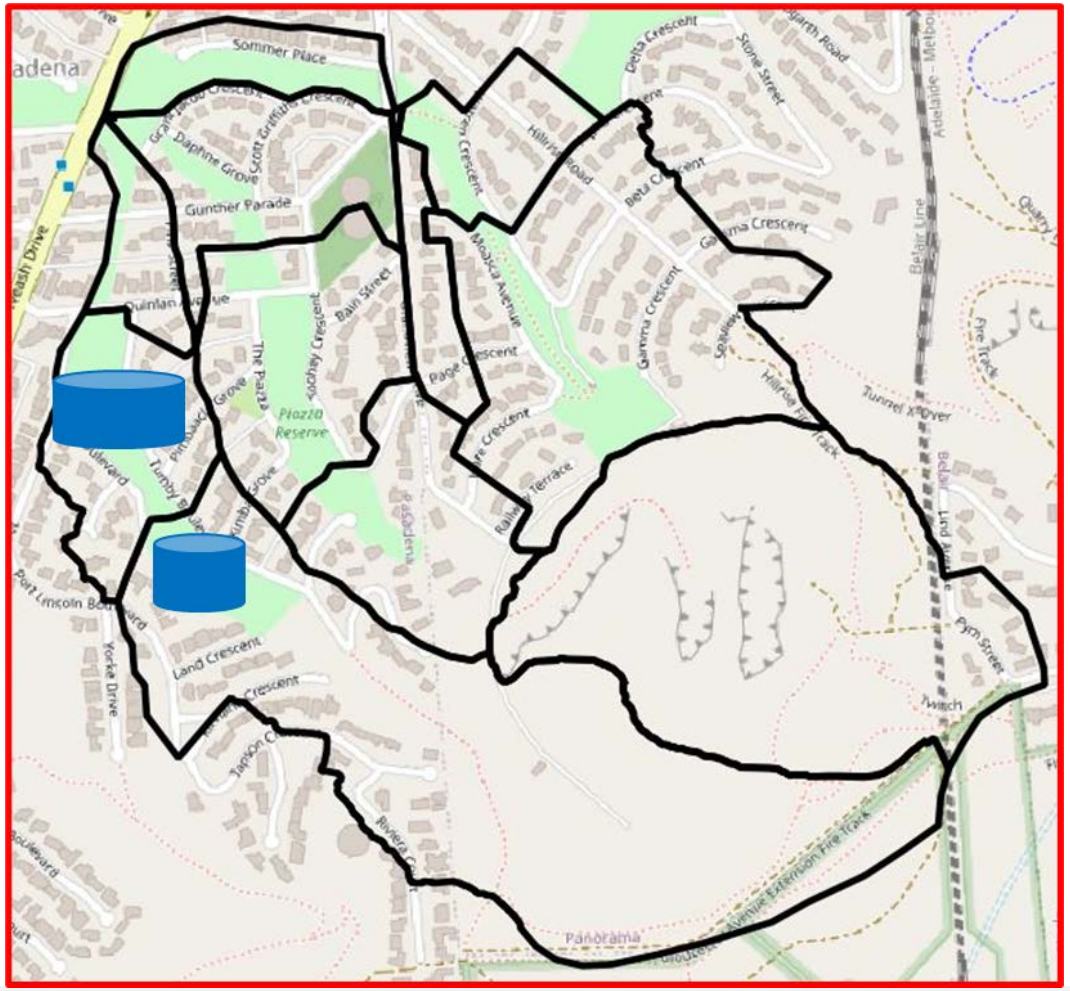
**Storage Locations Considered**



# Smart Design

Machine Learning is used to optimise storage location and size to achieve desired downstream flow rate

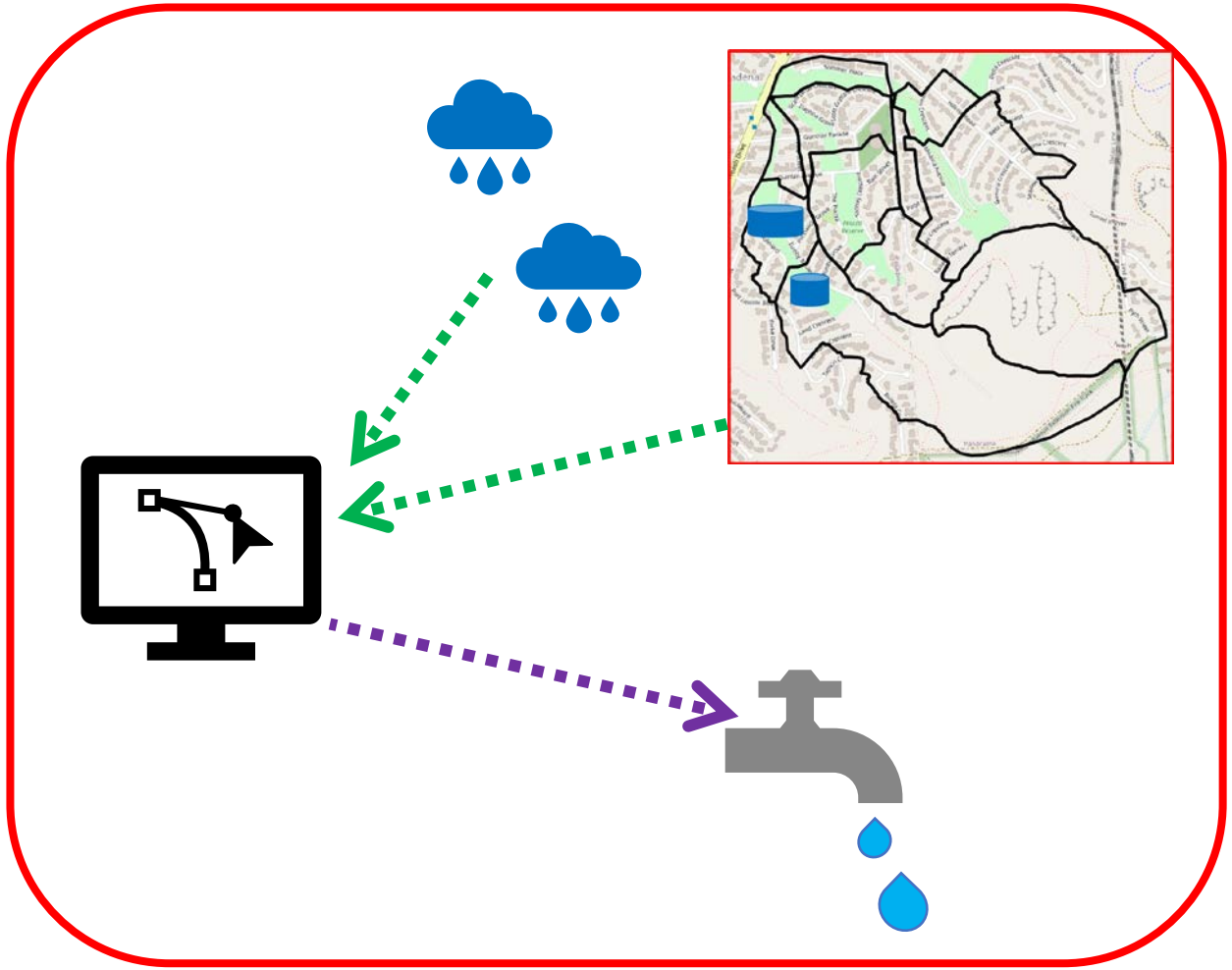
Low level of disruption, ready to implement



# Smart Control

**Adaptive Storage and Release System**

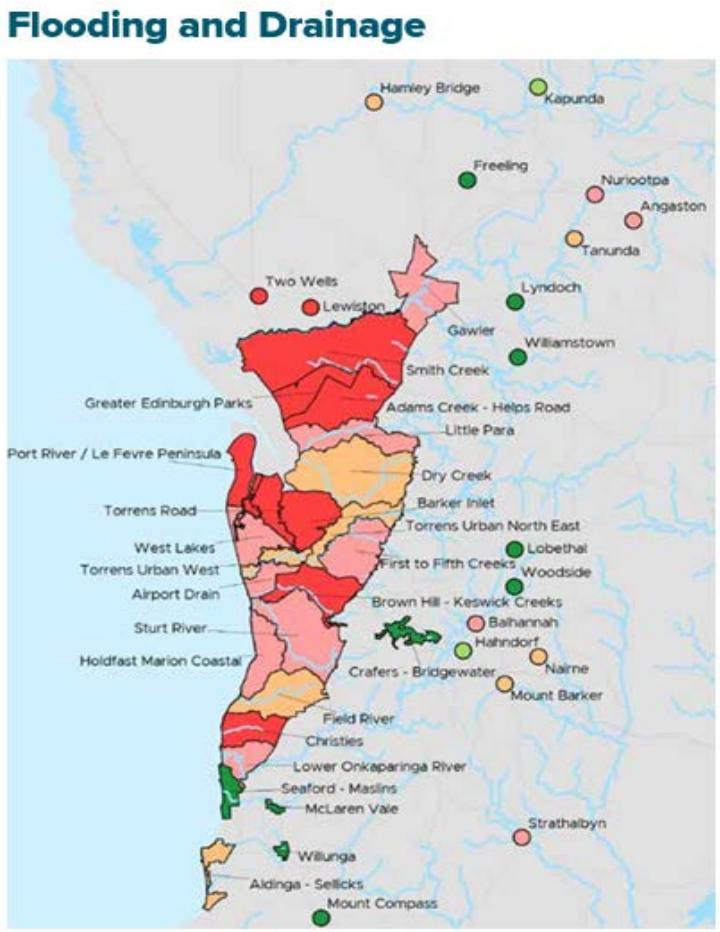
- Open and close storage outlet “during storm” to manage flows
- Adaptive to rainfall event, water levels and/or flows
- Provides opportunities for adaptation (e.g. climate change) – can be retrofitted to distributed storages
- Provides opportunities for co-benefits (e.g. urban greening, water quality improvement)
- Uses Machine Learning to optimise “during storm” control rules



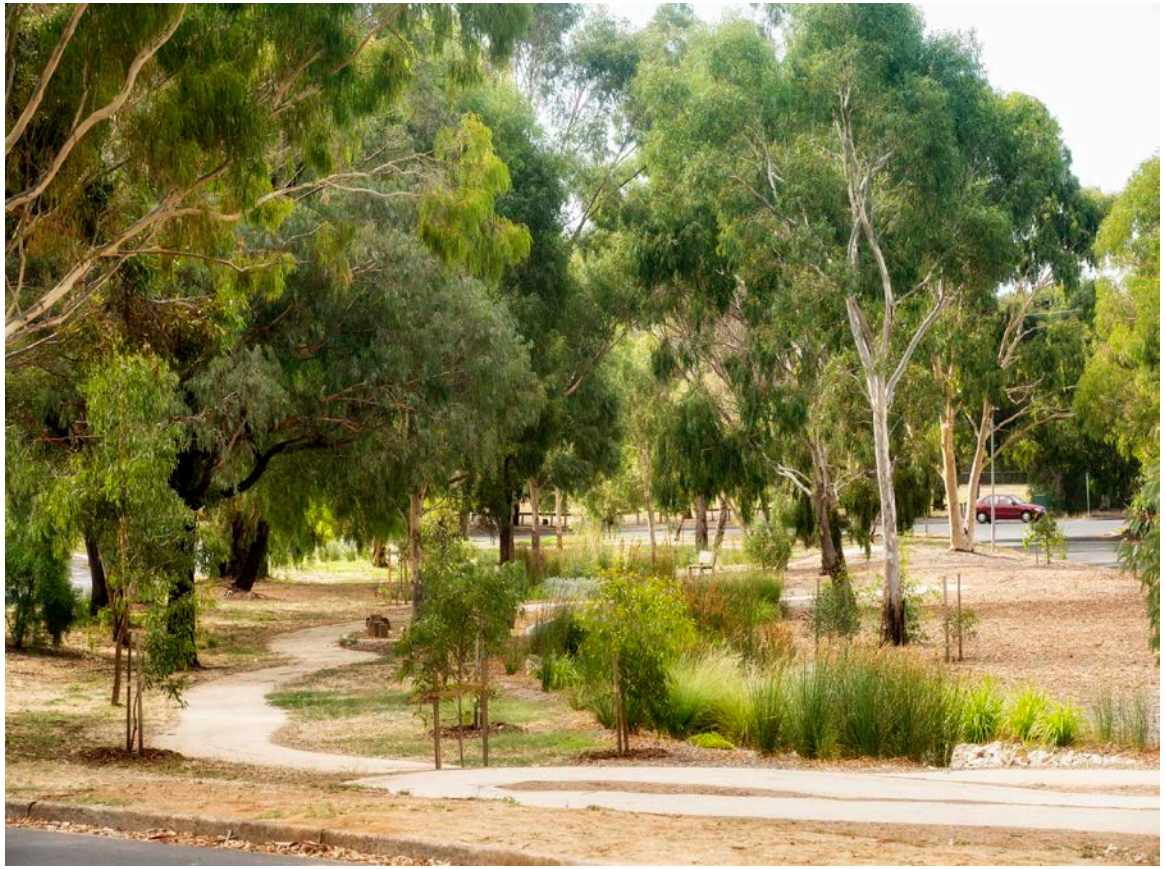
# Smart Stormwater Systems

## Why was our grant bid successful?

**Potential $m savings in stormwater infrastructure investment across SA**



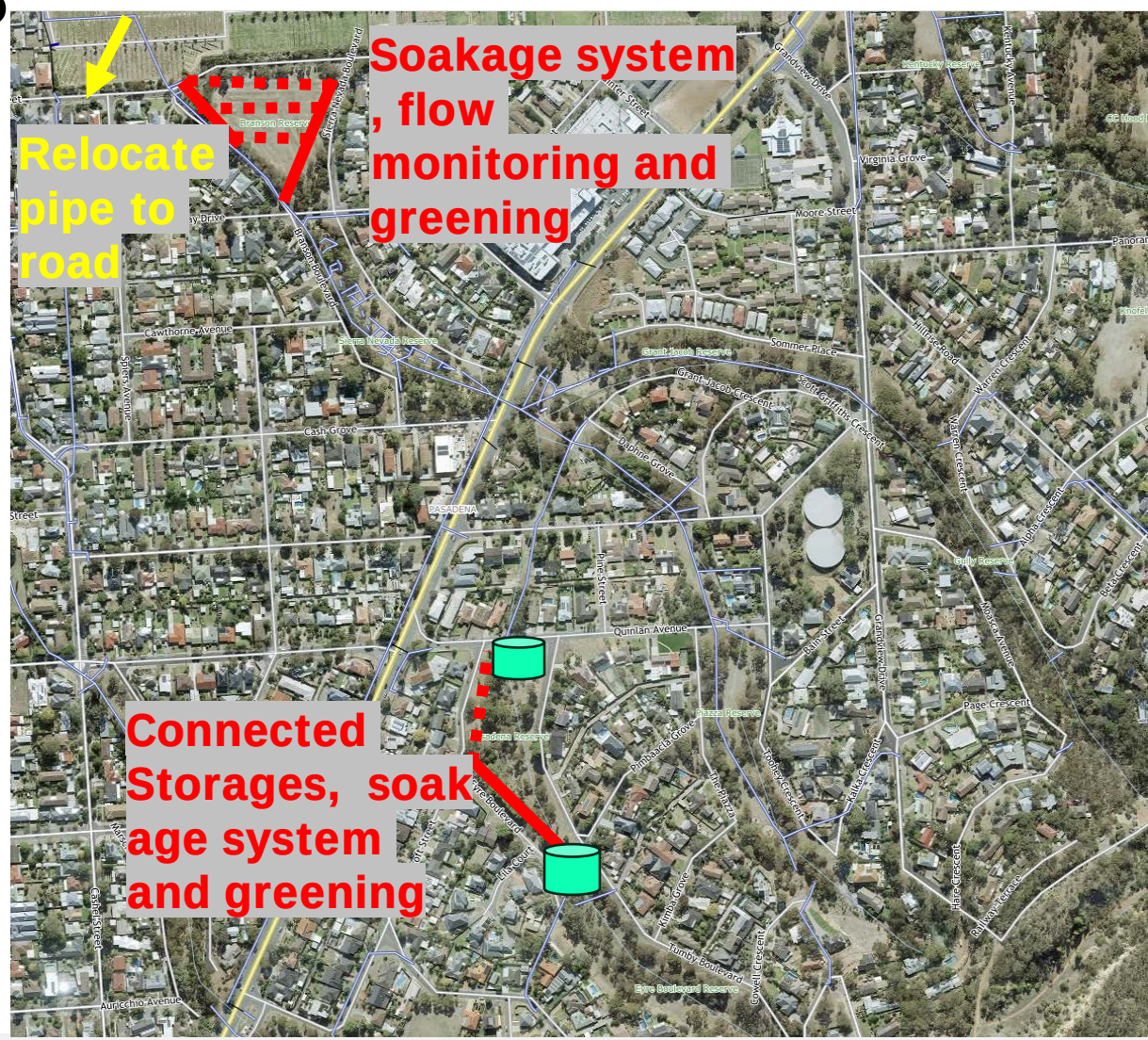

**Provide water to support Urban Greening**



# Overview and Benefits

Proposed design will:

- Hold flows upstream to reduce downstream flows in stormwater system
- Allow more water to be available for greening and cooling for longer
- Improve greening and cooling benefits and allow additional biodiversity plantings in Pasadena and Branson Reserves
- Allow relocation of pipe from Centennial Park to increase available cemetery plot numbers.

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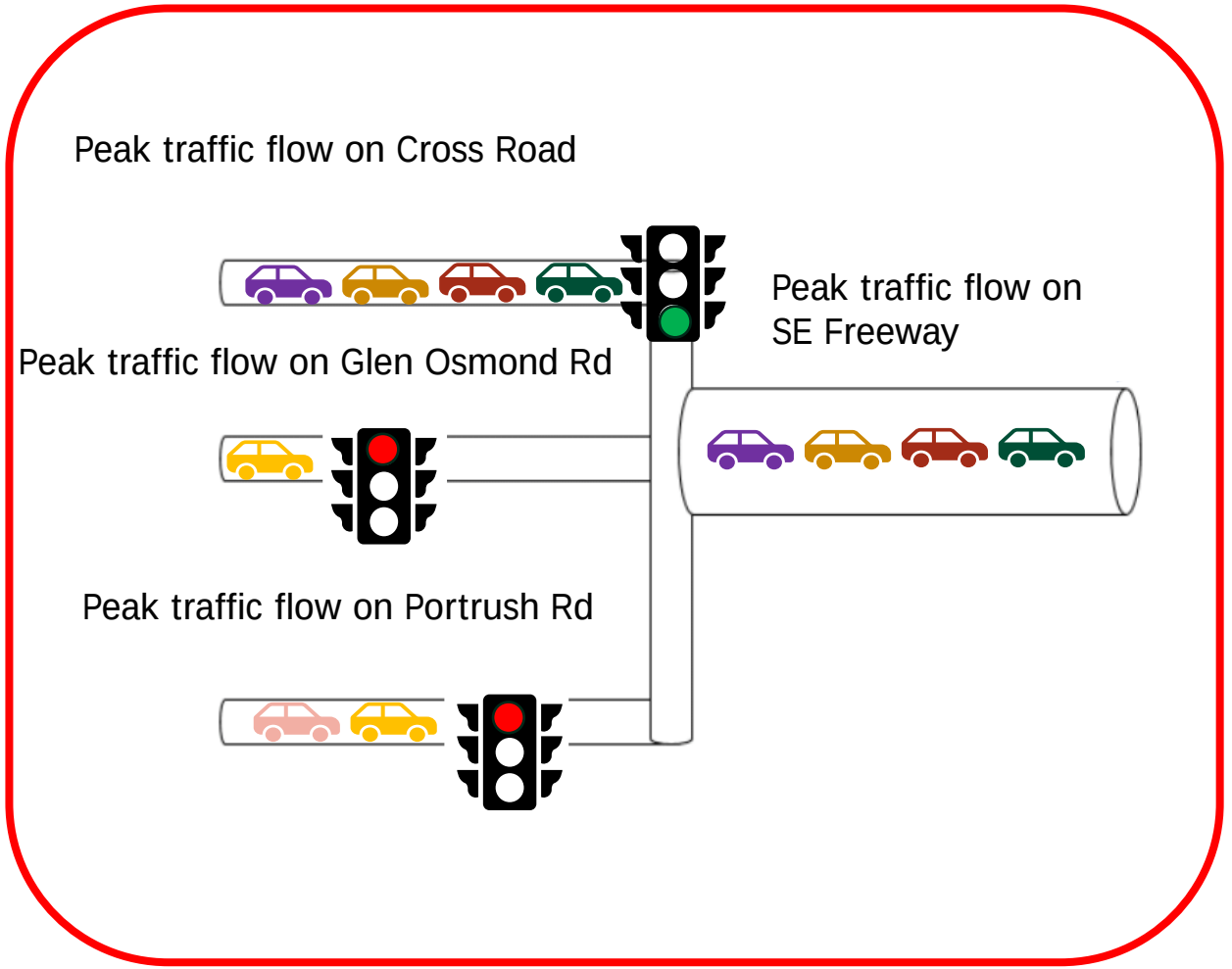
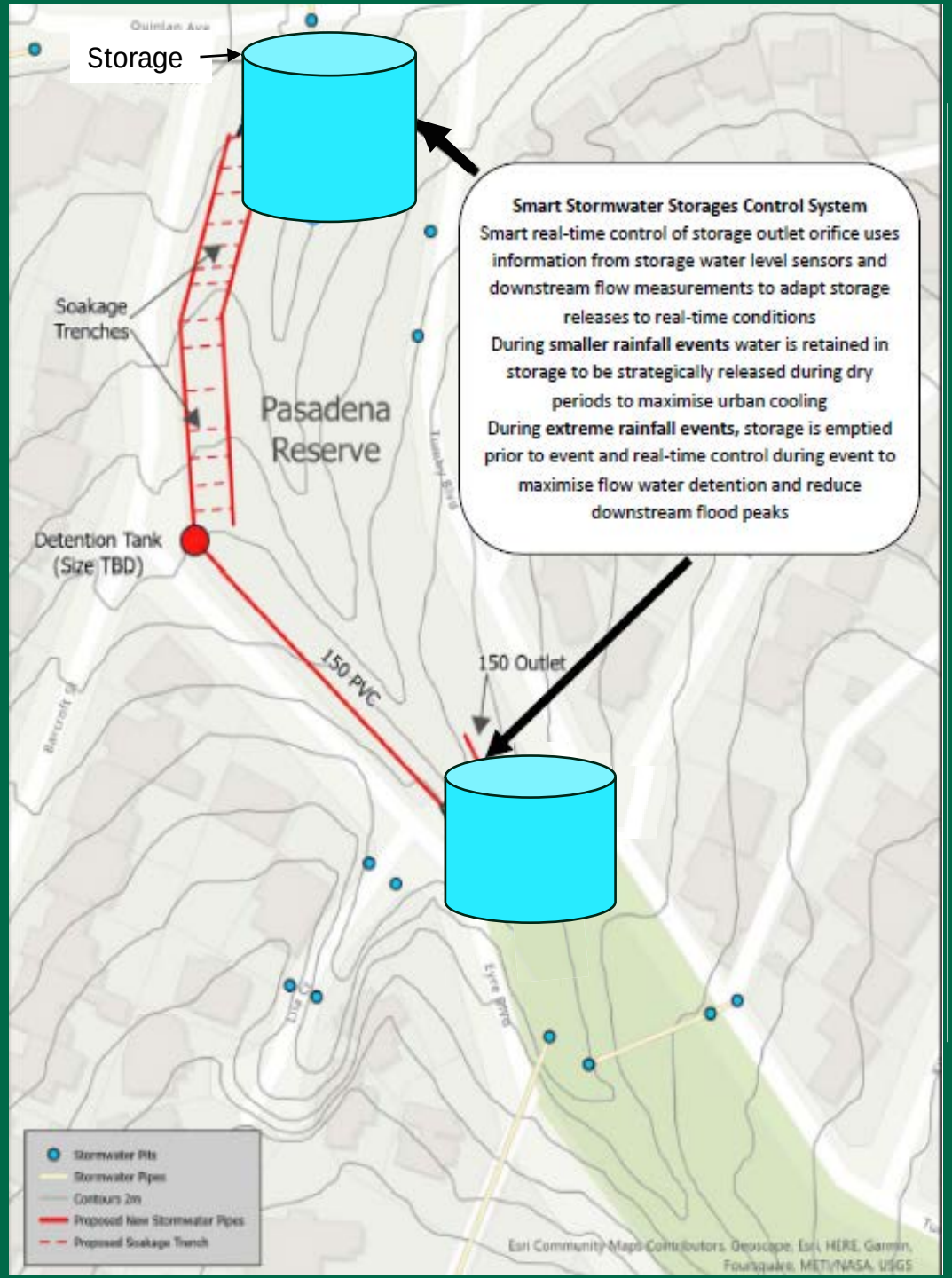
# Traffic Analogy

## Traffic Flow

- Consider pipes as roads carrying vehicle traffic in peak hour
- Detention Storages act like red traffic lights
- Allows traffic from one direction to travel forwards
- Consider peak hour traffic at 5pm approaching the entrance to the SE Freeway at Portrush Rd / Glen Osmond Rd / Cross Rd
- Traffic lights slow flow traffic flows from some directions getting to South-Eastern Freeway so there is less congestion on the freeway






# Pasadena Reserve

Proposed detentions and soakage trench system

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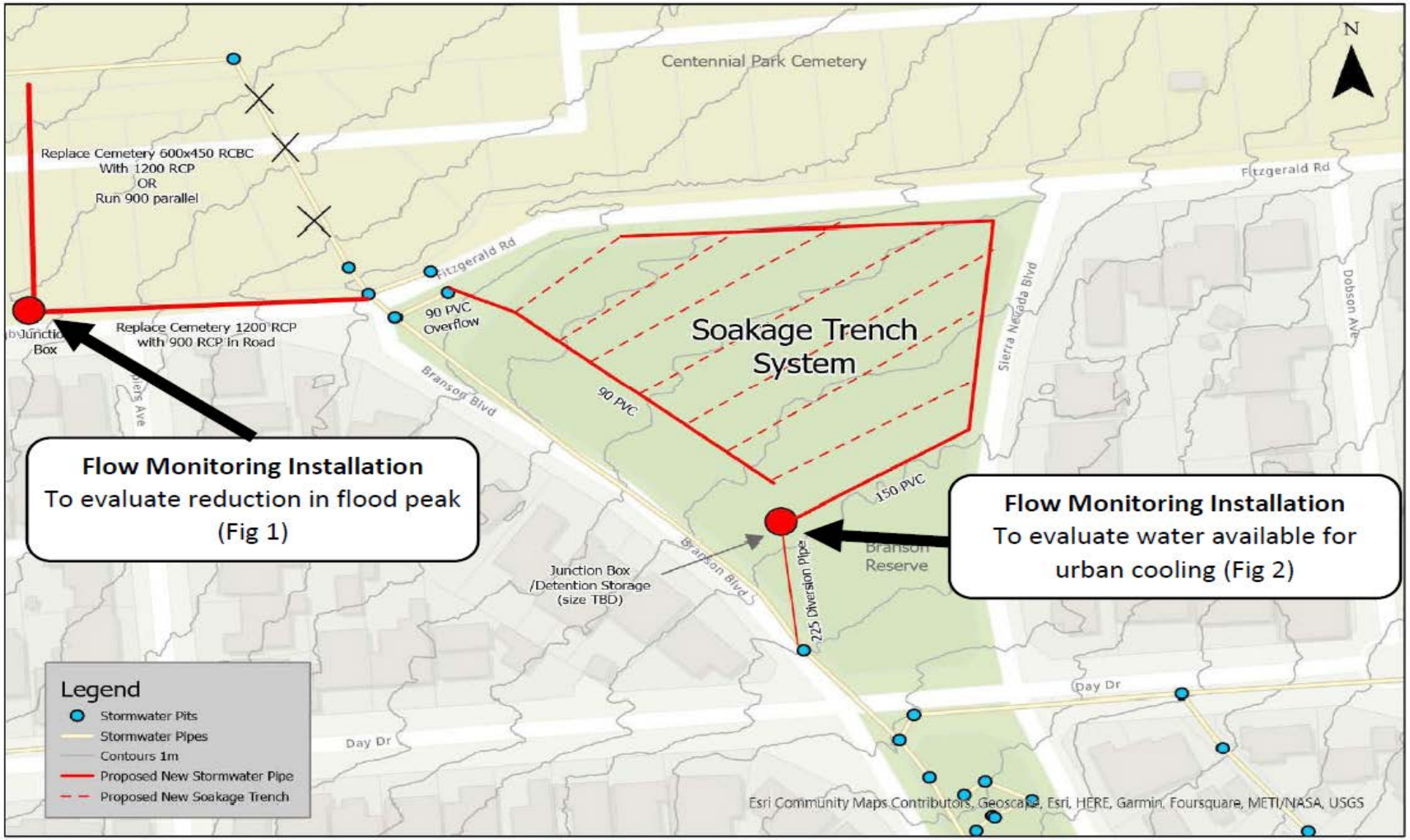
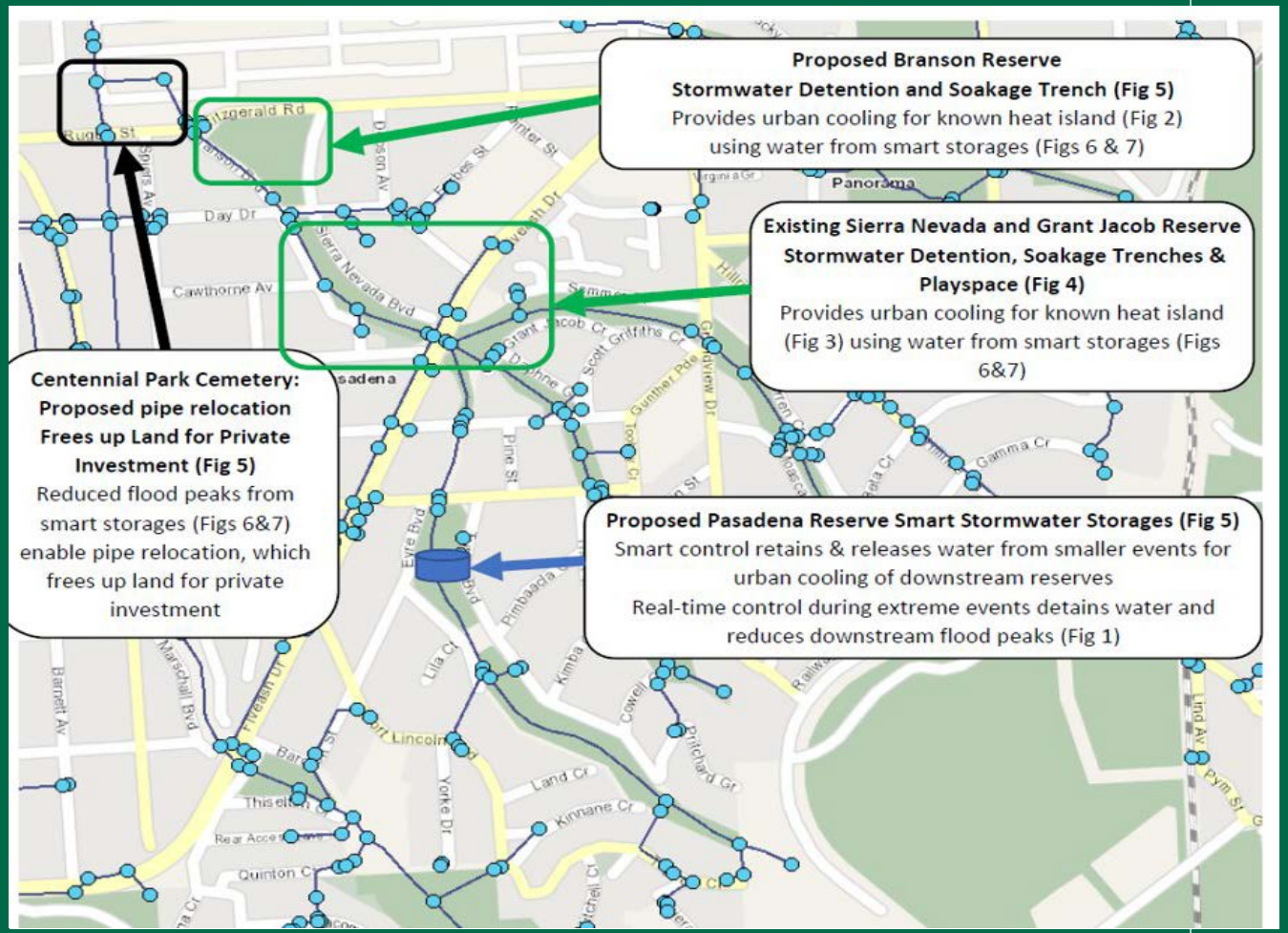



**Figure 5. Proposed Branson Reserve Soakage Trench System for Urban Cooling and Centennial Park Pipe Relocation**




# Pasadena & Branson Reserves

Proposed detentions and soakage trench system

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