Water Streets:

Transport infrastructure to make space for water

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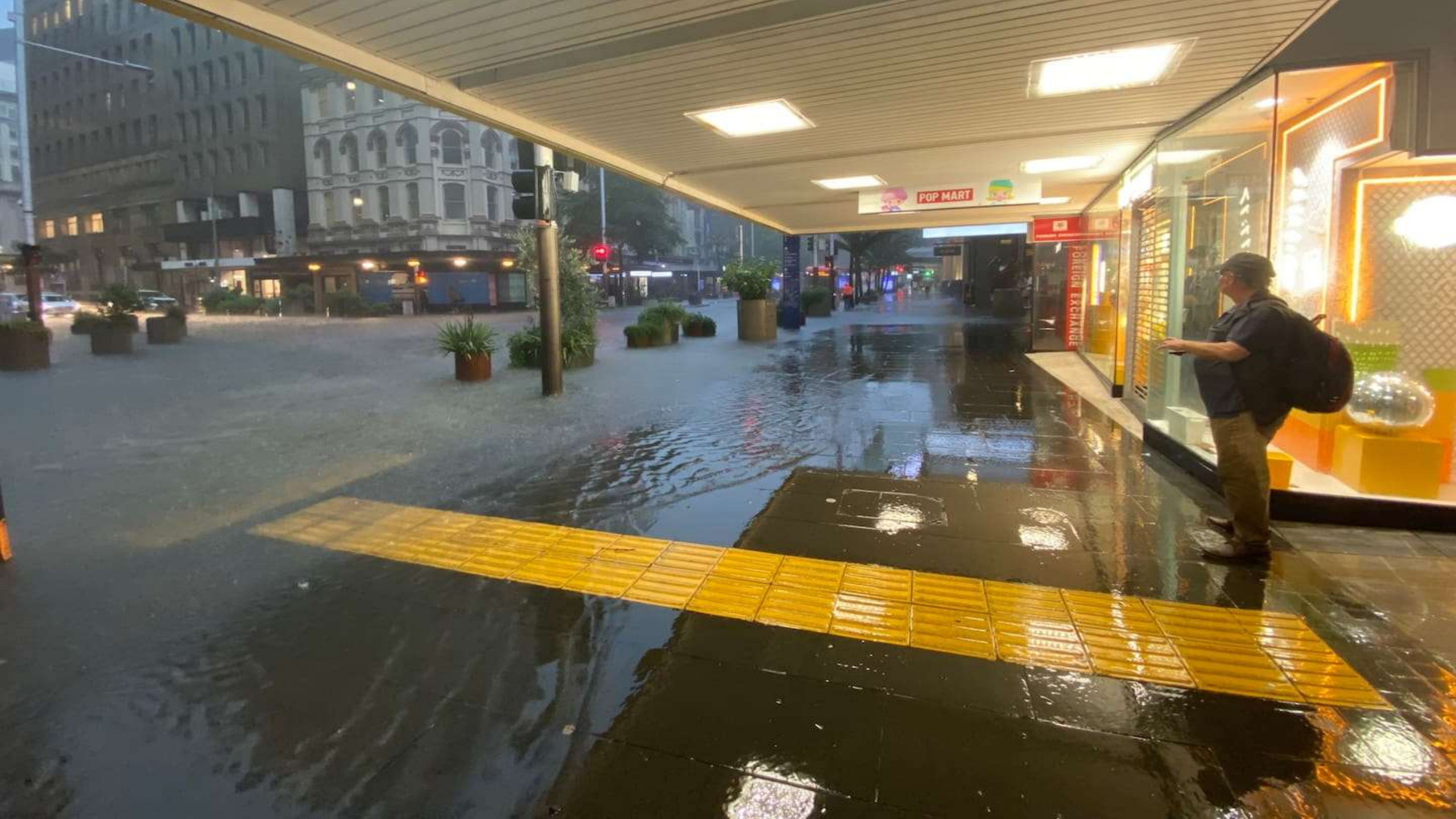
MORPHUM ENVIRONMENTAL

Overview

- ❑ Historical Context
- ❑ Urban Stream Syndrome
- ❑ Three Levers to Improve our Water Quality
- ❑ A Streetscape that Makes Space for Water
- ❑ An Ecological Build Zone?


QUEEN ST
POP
Queen St
Google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FOREIGN EXCHANGE

HISTORICAL CONTEXT

Historical context

- Geologically young
- Tectonically active
- Erosion from water
- Important resource

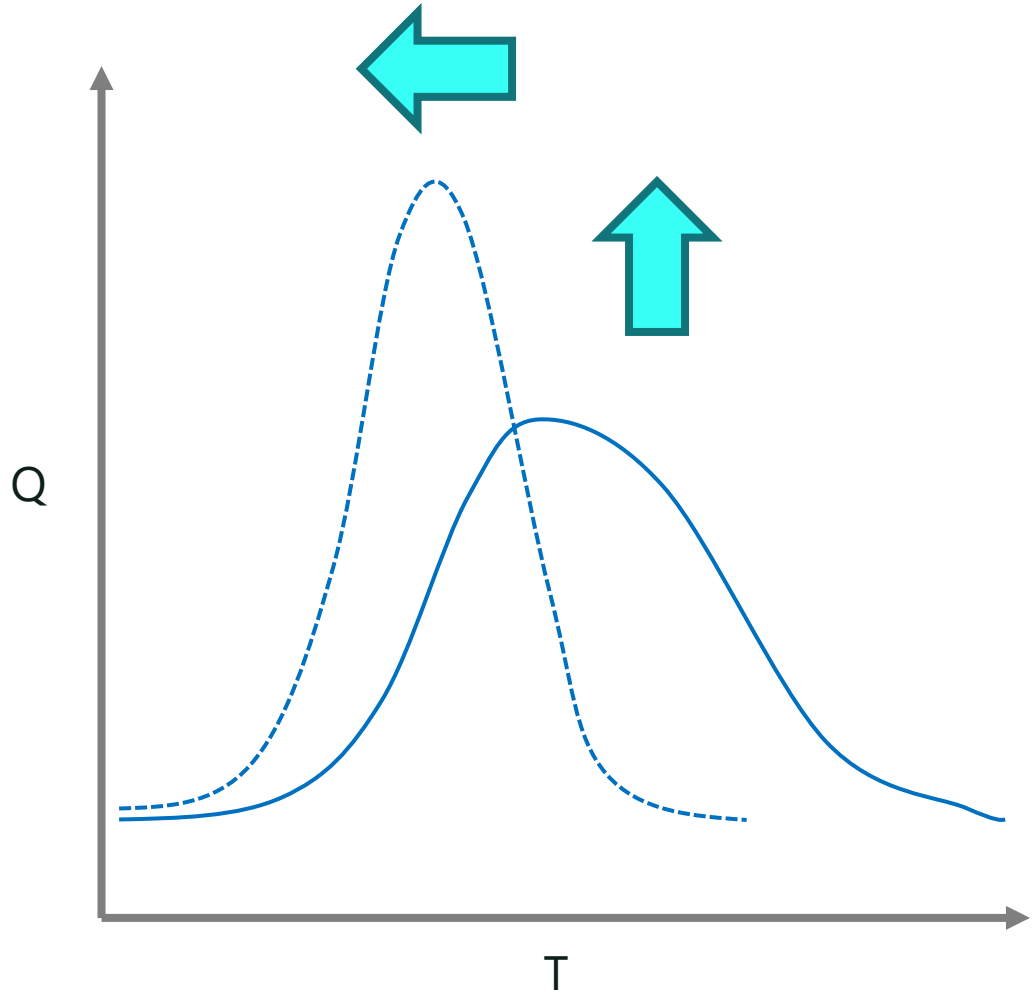
Historical context

- Colonization
- Urban streams as sewers
- Urban ‘development’
- Lost connections

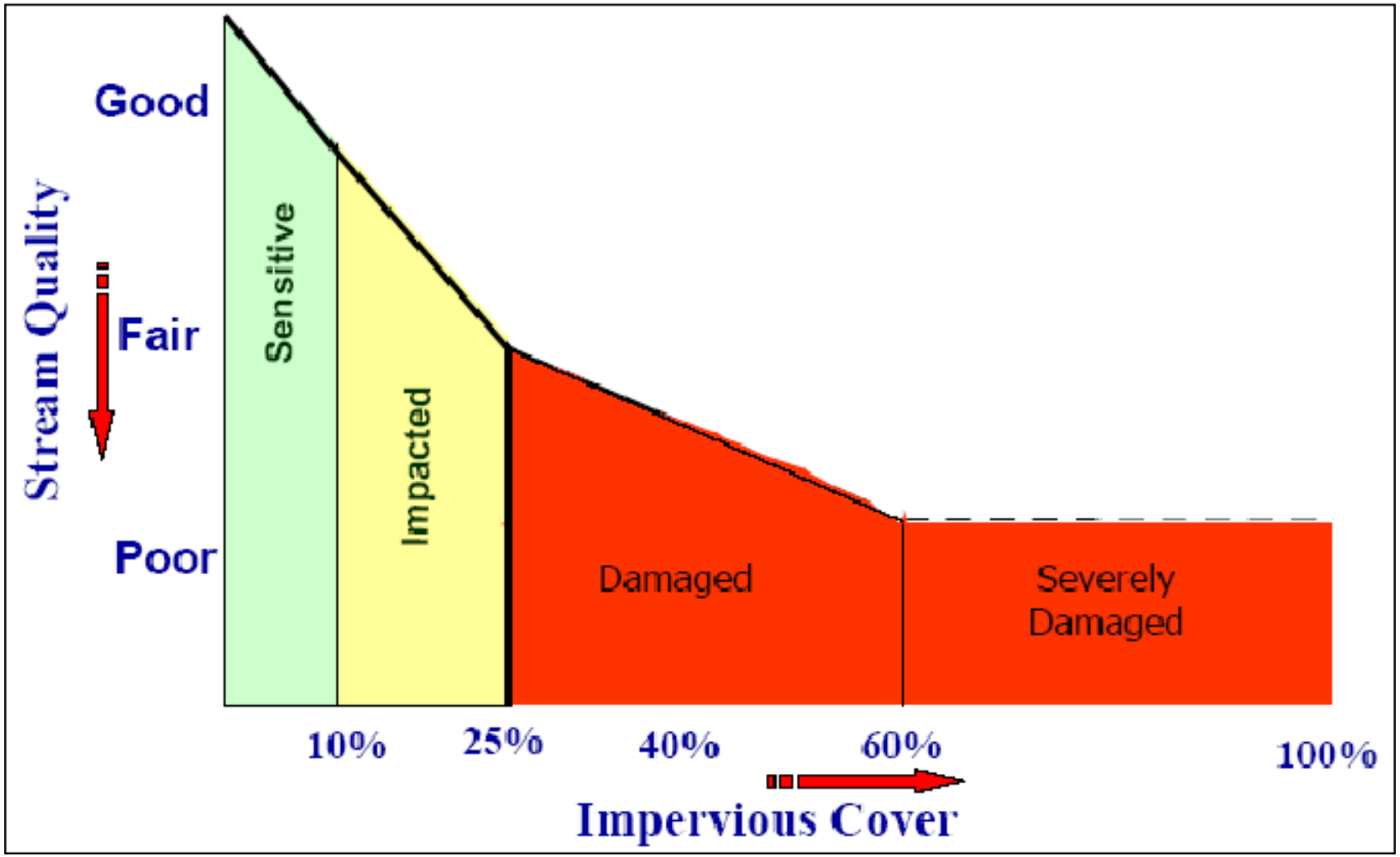
URBAN STREAM SYNDROME

Urban Stream Syndrome

- Increased impervious surfaces
- Increased riparian connection
- Increased stream power
- Increased temperature
- Faster flows, higher flood peaks
- Altered channel morphology
- Increased nutrient and contaminant concentrations



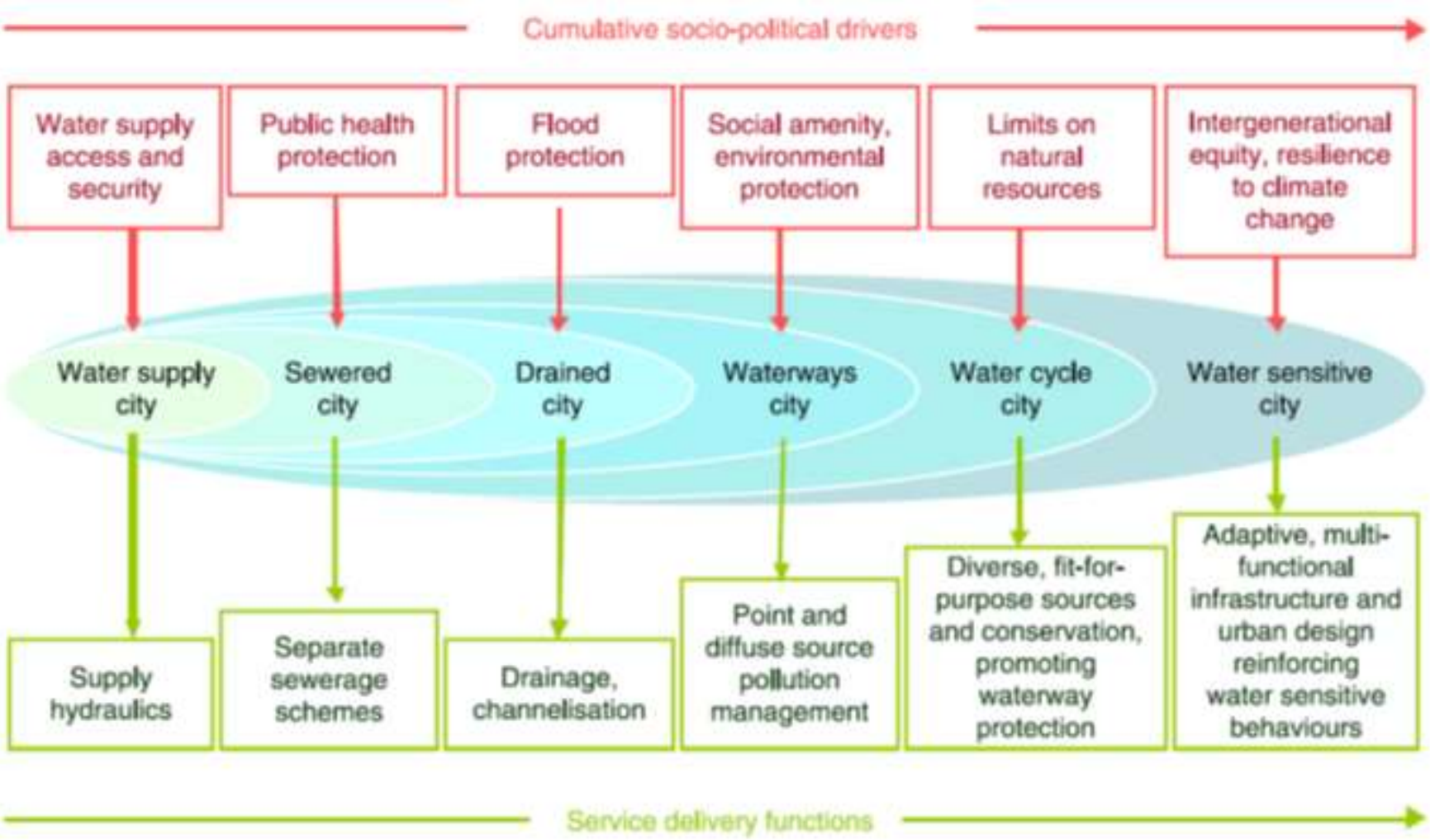
Urban Stream Syndrome



Source: Center for Watershed Protection, 2003

THREE LEVERS TO IMPROVE OUR WATER QUALITY

Water Sensitive Cities



Ecological Net-Gain

- RMA uses biodiversity offsetting
  - "Least Worst"
  - Biodiversity decline
- Ecological Net-Gain
  - Measurable improvement
  - Infrastructure design goals

Te Mana o te Wai

- Three priorities for freshwater
  - 1. The health and well-being of water;
  - 2. The health needs of people; and
  - 3. The social, economic and cultural well-being of people and communities.
- Those with authority must prioritize (improving and enhancing where required) the health of waterways now and into the future to ensure the needs of future generations are sustained

A STREETSCAPE THAT MAKES SPACE FOR WATER

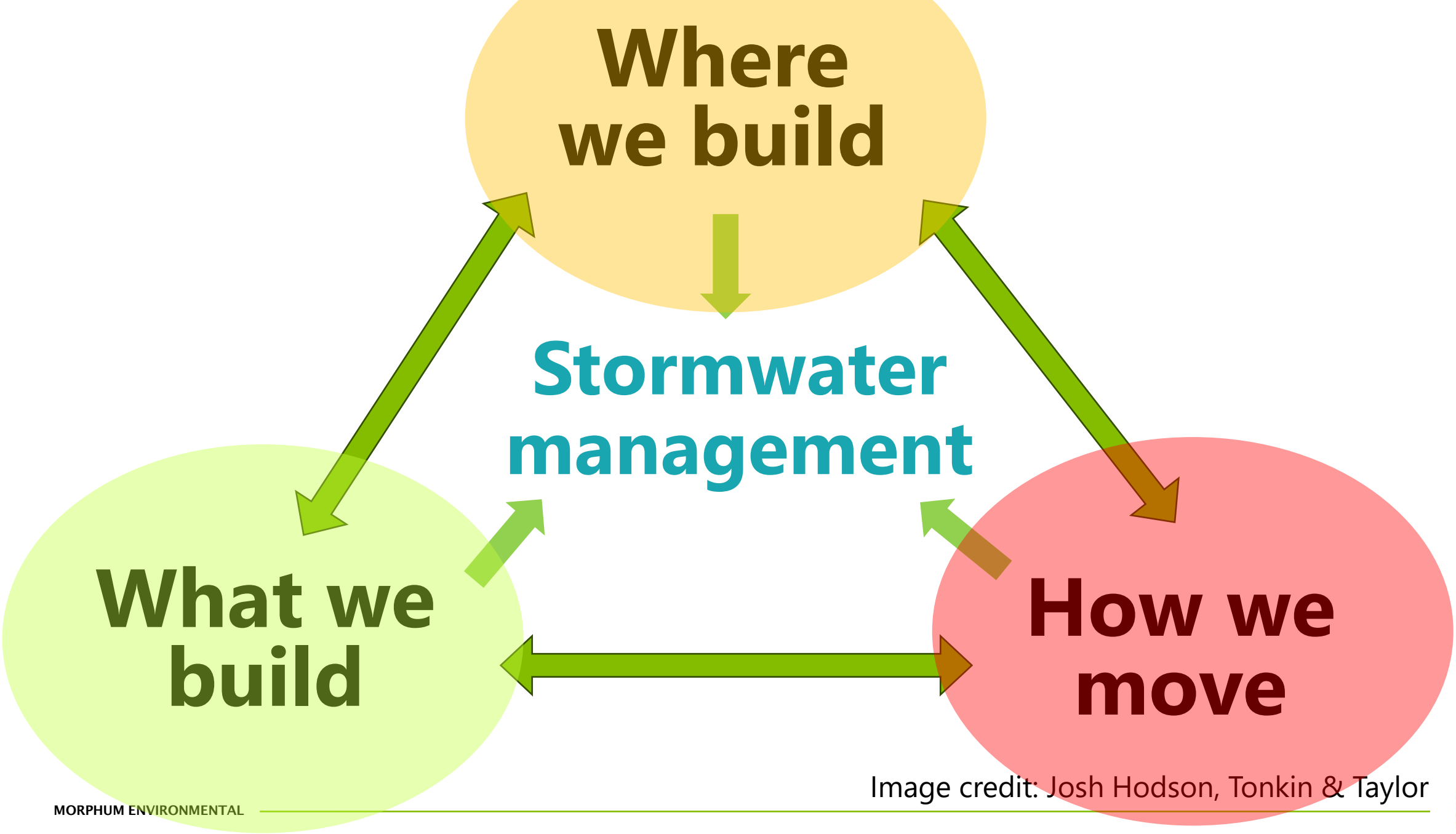


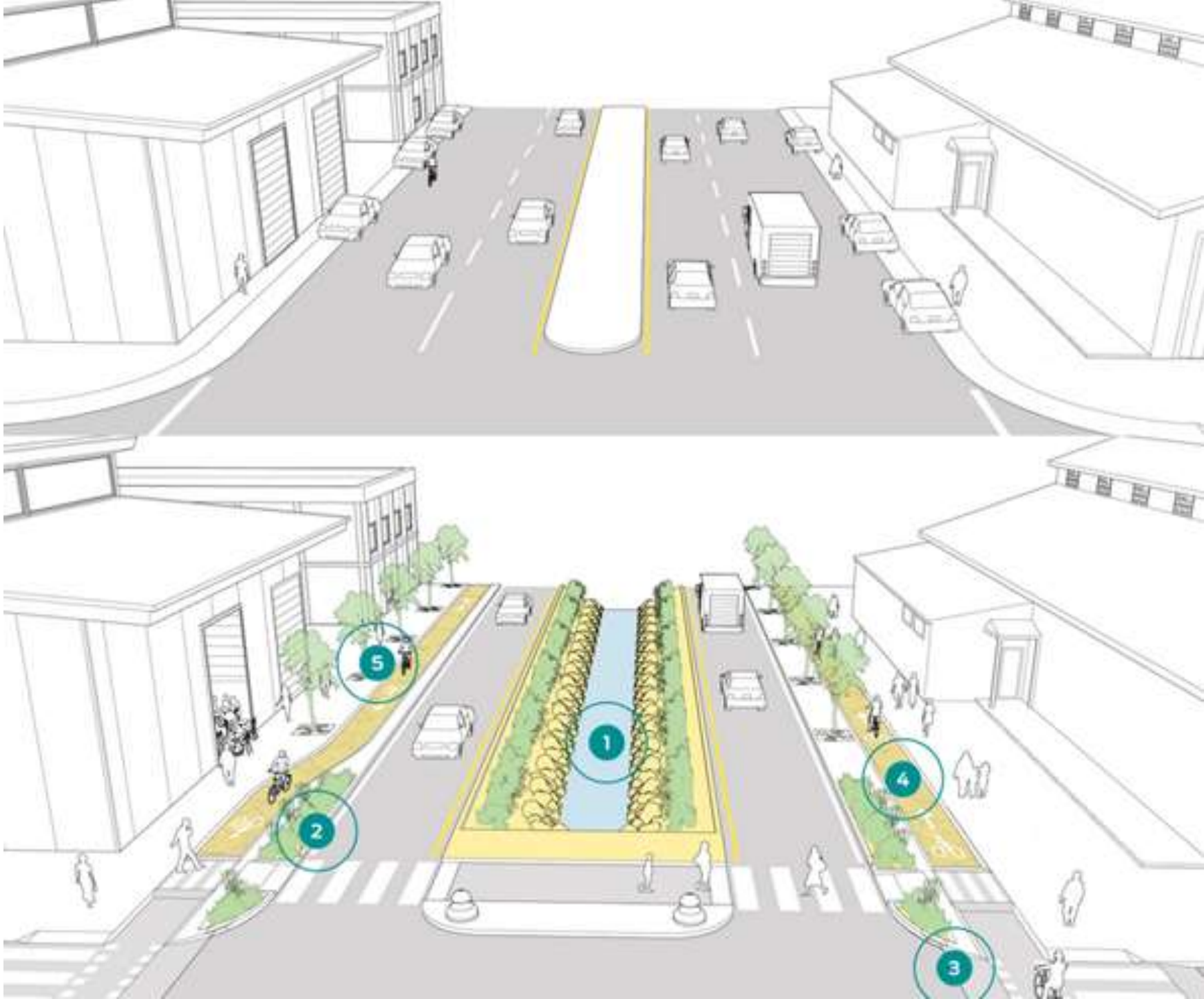
Image credit: Josh Hodson, Tonkin & Taylor

Making space for water

- What value do we assign to stormwater?
- Conflict with legislated requirements under the LTA?
  - Water quality only considered as a regulatory requirement
  - Separation between different agencies
- Nuisance to non-potable resource
  - Sportsfield irrigation capture
  - Street cleaning
  - Commercial washdown uses

NACTO "stormwater greenway"

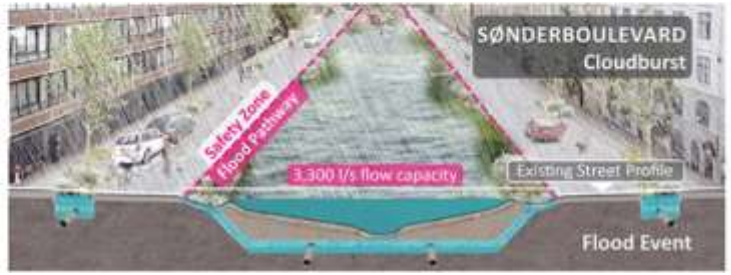
1. Daylighted channel
2. Kerbside green infrastructure
3. Raised pedestrian crossings
4. Bike paths with permeable paving
5. Trees for rainfall interception and shading



Copenhagen "cloudburst"

- Center running swale
- Tree pits and raingardens
- Raised pedestrian crossings
- Infiltration only, no direct connections
- High intensity rainfall directed to the center

Rain Event Handled within Multi-Functional Tools including Urban Creek, Retention Boulevard, and Boulevard



Rescaping our streets?

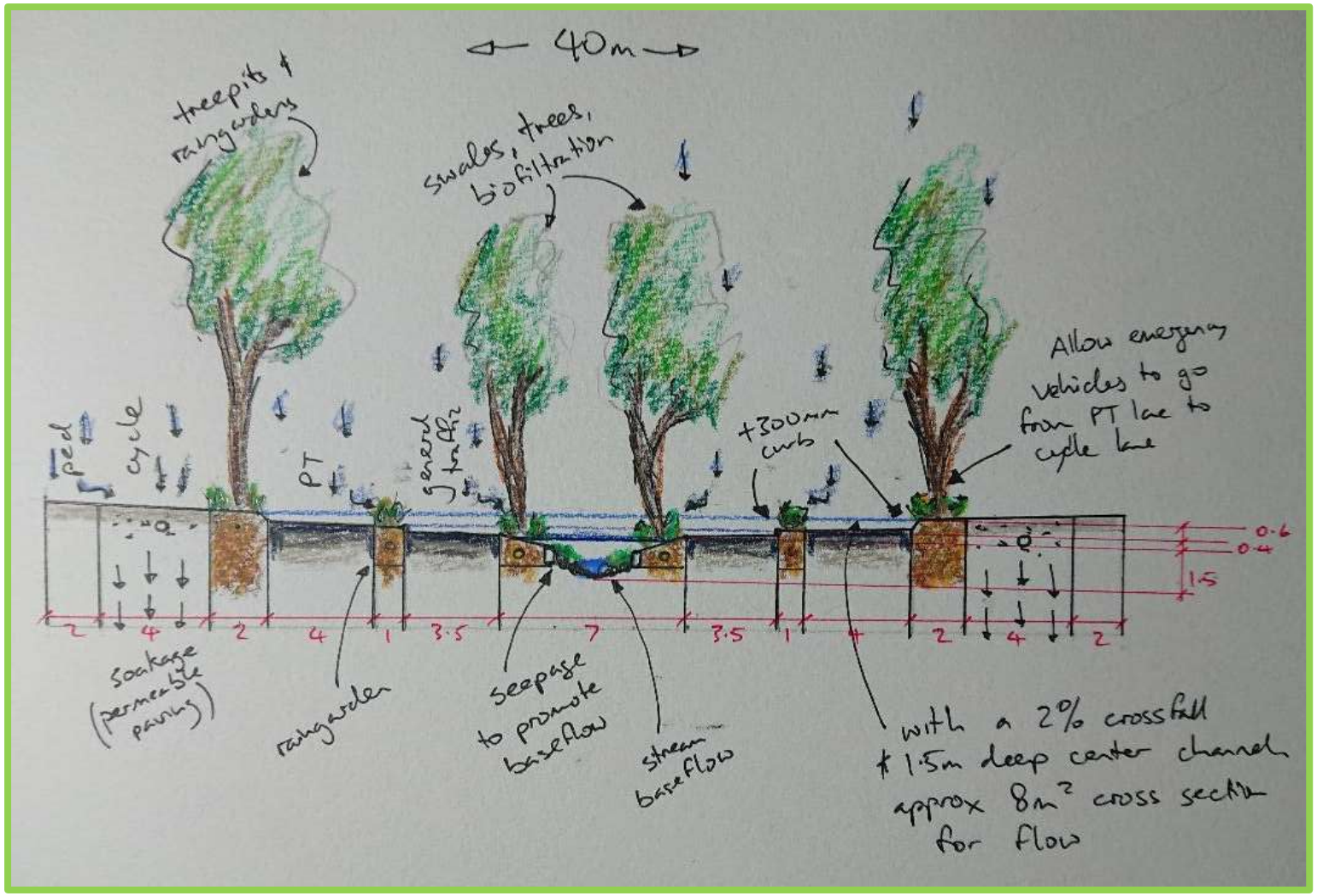
- Cheonggyecheon, Seoul
- Opened 2005
- Reduced traffic into central city
- Improved traffic flow
- Average temperature decrease 3.6°C

Rescaping our streets?

- Credit: DCM Urban Design
- Kent and Cambridge Terraces, Wellington

Rescaping our streets?

- Allow baseflow back to the surface
- General traffic lanes allowed to flood
- Emergency vehicles can use PT and cycle ways
- Biofiltration to small pipes, seepage to stream



AN ECOLOGICAL BUILD ZONE?

Roots in the Sky, Fabrix & Sheppard Robson Architects

Ecological Build Zone

- Expand the scope of Water Streets to the entire catchment
- Reward green infrastructure with bonus development rights
  - Intensive green roof with trees and public access
  - Extensive green roof
  - External green walls
- Floodable pocket parks

Photo credit: Evolta

NGĀ MIHI NUI
PATAI?

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