

# Sustainable Drainage Systems (SuDS)

theurbanists



***We bring together Town Planning,  
Masterplanning, Urban Design,  
Landscape Architecture (and a little  
Architecture) to ensure we create places  
that people feel good about.***

*The Urbanists Mission*

theurbanists

## Who we are



Mark Farrar



Daniel Smith

# What we're going to cover

- A brief overview of Sustainable Drainage Systems (SuDS) and why it's important
- Welsh Government recommendations for changing the current system and potential implications
- Next steps for SuDS, summary and our lessons learnt



## What are SuDS?

*Sustainable **D**rainage **S**ystems to manage surface water that take account of water **quantity** (flooding), water **quality** (pollution) **biodiversity** (wildlife and plants) and **amenity** (people)*



**Why is it necessary?**





Flooding in Doncaster - The Joseph Rowntree Foundation



*‘Water is a **valuable resource** and managing it in an integrated way can provide multiple benefits. From ensuring we have enough to thrive in supplying to homes, businesses and food production as well as for nature we also have to anticipate and **mitigate for the climate risks of flooding or drought.***

*In particular, we want to avoid drainage infrastructure being overwhelmed with the environmental implications of storm overflow discharges, so we can improve and increase **biodiversity and habitats.***

*Ministerial foreword: The review for implementation of Schedule 3 to The Flood and Water Management Act 2010 (2022)*

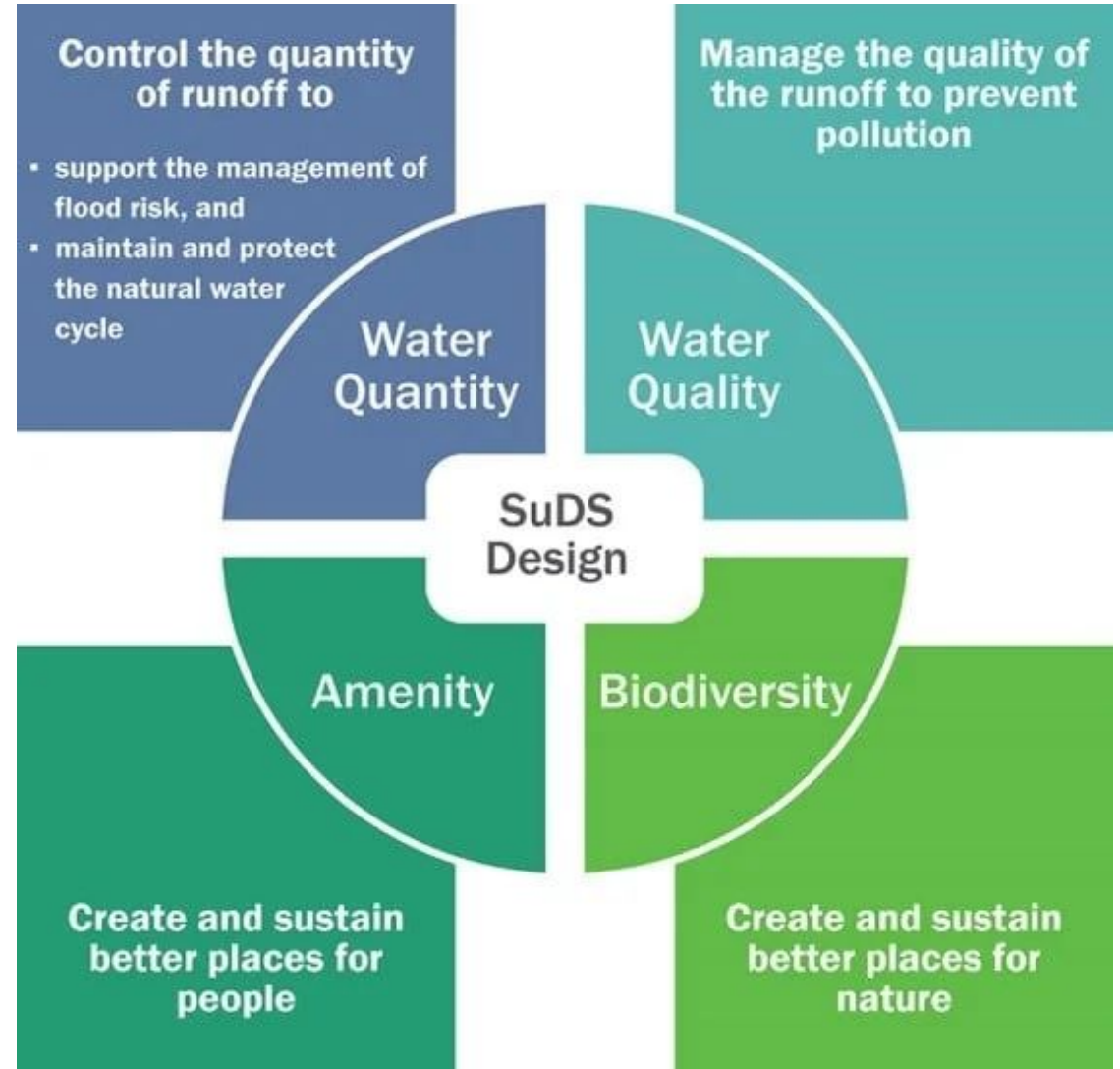


## Understanding the four (4) pillars of SuDS

1. Water Quantity
2. Water Quality
3. Amenity
4. Biodiversity

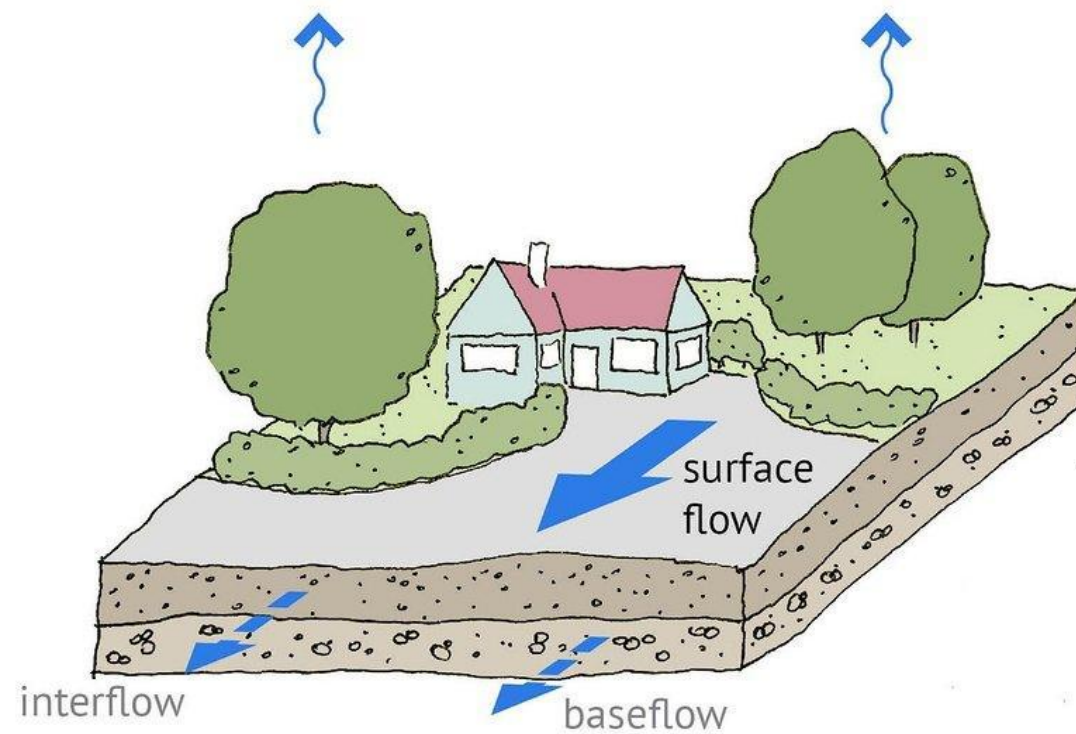
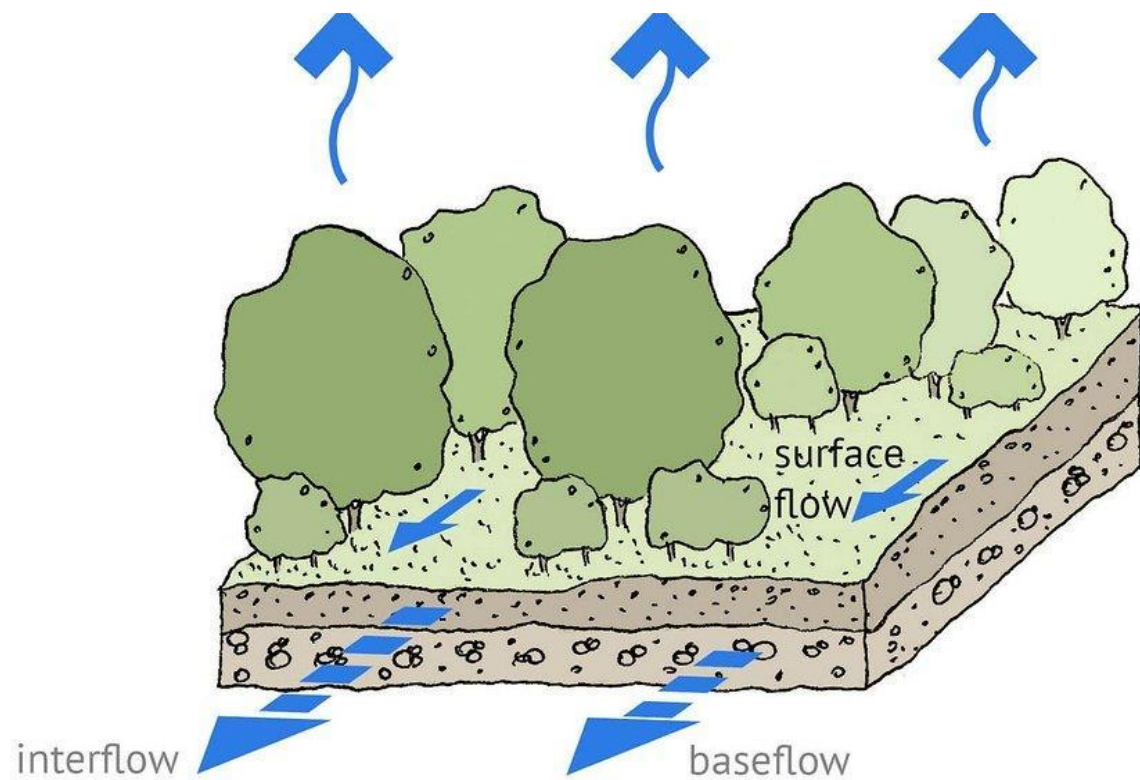
But how about a fifth?

1. Cost...



# The natural vs urban

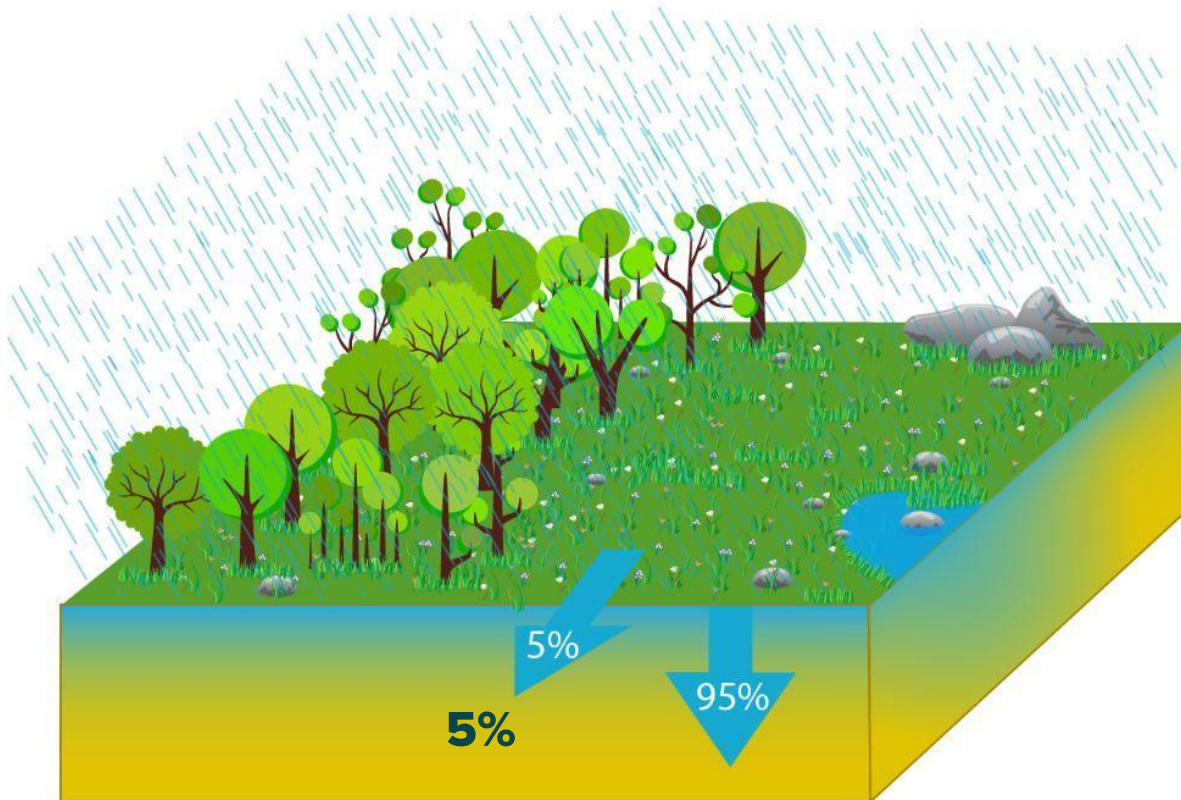
*Evapotranspiration*





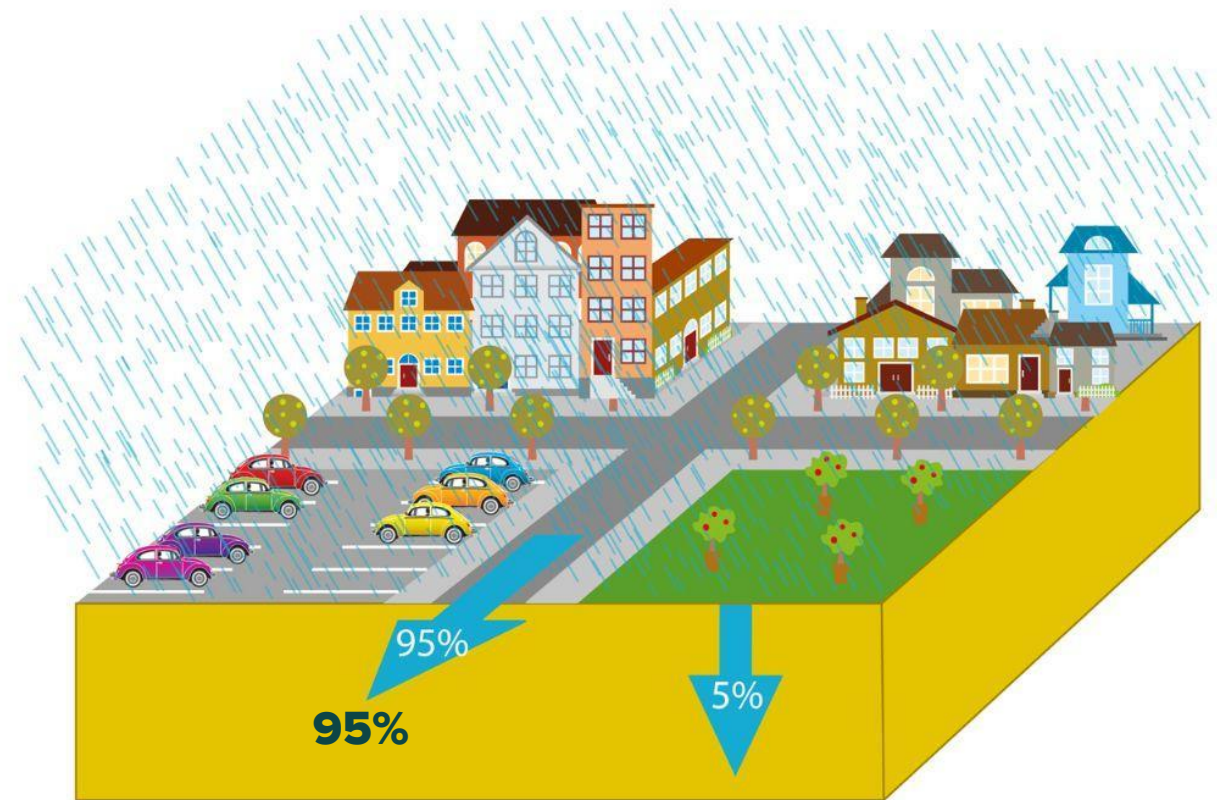
theurbanists

## Or put another way



**Before**

**95%**

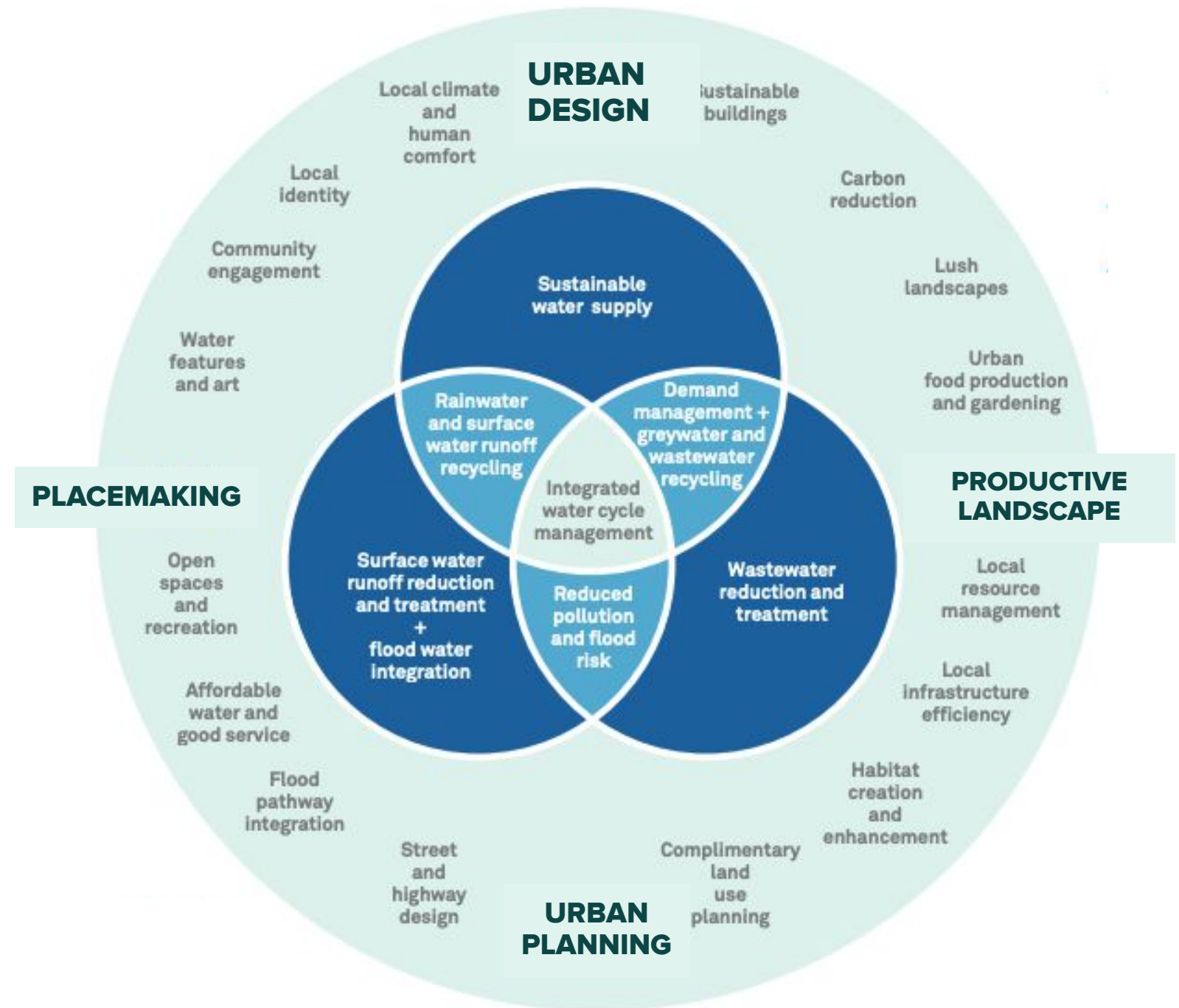


**After**

**5%**

theurbanists

## Bringing together a holistic approach



Source: Water Sensitive Urban Design



# Understanding the language of SuDS



Infiltration basins

A photograph showing a series of parallel black pipes or culverts installed in a trench, designed for water infiltration into the ground.



Detention ponds

A photograph of a large, calm body of water in a residential area, with a small wooden structure in the center and houses visible in the background.



Soakaways

A close-up photograph of a square concrete structure with a pipe entering, designed for water to soak into the ground.



Swales

A photograph of a grassy area with a series of low, curved ridges or mounds, designed for water runoff and infiltration.



Field Drains

A photograph of a grassy field with a series of parallel, low ridges or mounds, designed for water runoff and infiltration.



Green roofs

A photograph of a building with a flat roof covered in green vegetation, with a city skyline in the background.



Infiltration trench

A photograph of a long, narrow trench filled with gravel, designed for water infiltration into the ground.



Bioretention

A photograph of a landscaped area with a concrete curb and a bed of plants and mulch, designed for water runoff and infiltration.



Wetlands

A photograph of a body of water with tall grasses and reeds, designed for water treatment and infiltration.



Pervious pavements

A photograph of a paved area made of interlocking bricks, designed for water infiltration into the ground.

## A Jargon Buster

Source: Hidrología Sostenible



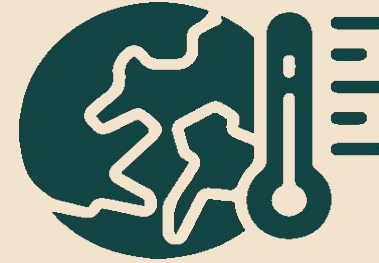
## What does a joined up SuDS offer?



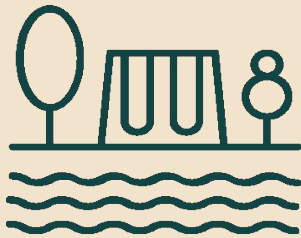
**Water quality**



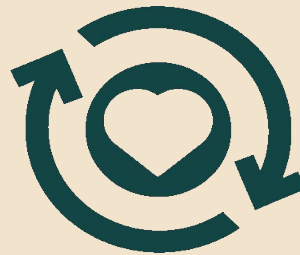
**Enhance  
biodiversity**



**Heat island**



**Amenity**



**Health &  
wellbeing**



**Reduce  
flooding**



## What can go wrong? - the good, bad and ugly



# **Welsh Government Post-Implementation Review of Schedule 3 of the Flood and Water Management Act 2010**



## Background

- Welsh Government led review of how the SuDS / SAB process has been working over past 4 years
- “eagerly awaited by our partners involved in delivering housing”
- To outline and prioritise recommendations to address issues raised through consultation
- Inform the WG approach to the use of SuDS to provide wildlife habitat

## Sustainable Drainage Systems (SuDS) Schedule 3 Post Implementation Review

### Post Implementation Review Report

Reference: 287773-ARP-00-00-RP-ZX-0001

P02 | 2 May 2023



© Photo credits: Top Left: Caerphilly Council & Llanmor Homes. Top right: The Urbanists. Bottom left: Arup & Walters. Bottom right: Bellway Homes

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 287773

Ove Arup & Partners Limited  
4 Pierhead Street  
Capital Waterside  
Cardiff  
CF10 4QP  
United Kingdom  
[arup.com](http://arup.com)



Llywodraeth Cymru  
Welsh Government

# theurbanists

## Outcomes and recommendations

- 17 emerging themes grouped into 4 categories:

**Governance and Resources;**

**Consistency;**

**Technical requirements; and,**

**Affordability and Enforcement**

- Recommendations based on these themes
- Categorised into: short, medium and long term



## theurbanists

A. Governance & Resource	B. Consistency
<ul style="list-style-type: none"><li>•Performance indicators</li><li>•Resources</li><li>•Skills gap</li></ul>	<ul style="list-style-type: none"><li>•Guidance</li><li>•Determination periods</li><li>•Application process (including alignment with Planning)</li><li>•Alignment with highways</li></ul>
C. Technical Requirements	D. Affordability & Enforcement
<ul style="list-style-type: none"><li>•Proportionality</li><li>•Technical standards</li><li>•Biodiversity and amenity</li></ul>	<ul style="list-style-type: none"><li>•Fees</li><li>•Enforcement</li><li>•Appeals</li><li>•Adoption</li><li>•Funding of long-term maintenance</li><li>•Inspections</li><li>•Bonds</li></ul>

## theurbanists

A. Governance & Resource	B. Consistency
<ul style="list-style-type: none"><li>•Performance indicators</li><li>•Resources</li><li>•Skills gap</li></ul>	<ul style="list-style-type: none"><li>•Guidance</li><li>•Determination periods</li><li>•Application process (including alignment with Planning)</li><li>•Alignment with highways</li></ul>
C. Technical Requirements	D. Affordability & Enforcement
<ul style="list-style-type: none"><li>•Proportionality</li><li>•Technical standards</li><li>•Biodiversity and amenity</li></ul>	<ul style="list-style-type: none"><li>•Fees</li><li>•Enforcement</li><li>•Appeals</li><li>•Adoption</li><li>•Funding of long-term maintenance</li><li>•Inspections</li><li>•Bonds</li></ul>



A. Governance & Resource	B. Consistency
<ul style="list-style-type: none"><li>•Significant resources and skills gap</li><li>•Resource sharing</li><li>•SuDS leadership</li></ul>	<ul style="list-style-type: none"><li>•Recurring theme through the review</li><li>•Determination periods causing project delays</li><li>•Pre-application process should be formalised with advice which can be relied upon later in the process</li><li>•Alignment with planning determination process</li></ul>
C. Technical Requirements	D. Affordability & Enforcement
<ul style="list-style-type: none"><li>•Proportionate risk-based approach is required to the application of technical standards, without disproportionately burdening small developments</li><li>•Retrofit SuDS needs guidance</li><li>•Biodiversity and amenity standards should be updated to align with Wales biodiversity policy</li></ul>	<ul style="list-style-type: none"><li>•Fees - SABs consider fees should be increased</li><li>•Guidance needed on minor amendments, enforcement, appeals, adoption, and non-performance bonds</li><li>•Priority is to have an approach to funding long-term maintenance with can be sustained</li></ul>

## Outcomes and recommendations - short term actions

- Introduce standard legal **forms**;
- Combine all **guidance** into one clear document;
- **National commuted sums** approach - rates, period;
- Consider a service charge approach levied by SABs for benefitting properties;
- Clear list of scenarios which do **not** require SAB approval - to support a proportionate risk-based approach; and,
- Provide a clearer and more appropriate **pre-application approach**, to be consistent across Wales.



## Further recommendations - medium to long term

### Consistency

- 'Sunset clause' - any planning approved or validated prior to 07/01/19 which has not started construction by 07/01/25 will then require SAB consent;
- SABs to prepare Local guidance (to be consistent format);
- Review the determination periods and 'deemed approval';
- Validation deadline should be set;
- Combined SAB and planning applications;
- Drainage Strategy showing SAB compliance with planning apps
- Consider making pre-application advice binding;

## Further recommendations - medium to long term

### Consistency and Technical

- SAB pre-app mandatory for major development;
- Combine planning and SAB pre-app processes;
- Allow minor / non material amendments post consent;
- SuDS in adopted highway guidance;
- Digital submission process (portal) with tiered application form;
- Amend SuDS standards for amenity and biodiversity;
- Review fees;
- Prepare guidance (enforcement)



## Further recommendations

### Amenity and Biodiversity

- Key recommendation to strengthen the requirements;
- Specific national guidance (linked to wellbeing);
- NRW's DECCA framework (Diversity, Extent, Condition, Connectivity, and Adaptability);
- WG COP15 Biodiversity Deep Dive and PfG commitments;
- PPW - Achieving net benefit for biodiversity - principles for planning applicants - assess, avoid, minimise, mitigate, compensate;
- Single response from LAs on both Planning and SAB; and
- Designing to maximise benefits.

## Further recommendations - medium to long term

### Affordability

- Review fee structure;
- Minor amendments (following approach to planning);
- National commuted sums approach - schedule of rates, and consider limiting to 30 years;
- Require LA income (commuted sums) to be used for SuDS maintenance; and,
- Guidance on bonds.



## Summary planning recommendations

- WG to consider and take forward TBD;
- Limited application to England due to different approaches but some points could influence how the English system is set up;
- Key recommendations 6 - 12 months, 1 year to 5 years;
- WG to confirm next steps in taking forward recommendations;
- New guidance;

## Summary landscape recommendations

- A **placemaking** led approach from the start
- Prioritising **Green** and **Blue Infrastructure** together
- **Right plant right place** to enhance biodiversity, and ensure climate resilience
- Getting the **soil spec** correct as important as **planting**
- Early **costs reviews** to help inform design feasibility
- Accepting that not everybody is **embracing SuDS** in the same way and balancing competing priorities
- Building in **post installation reviews** to keep learning



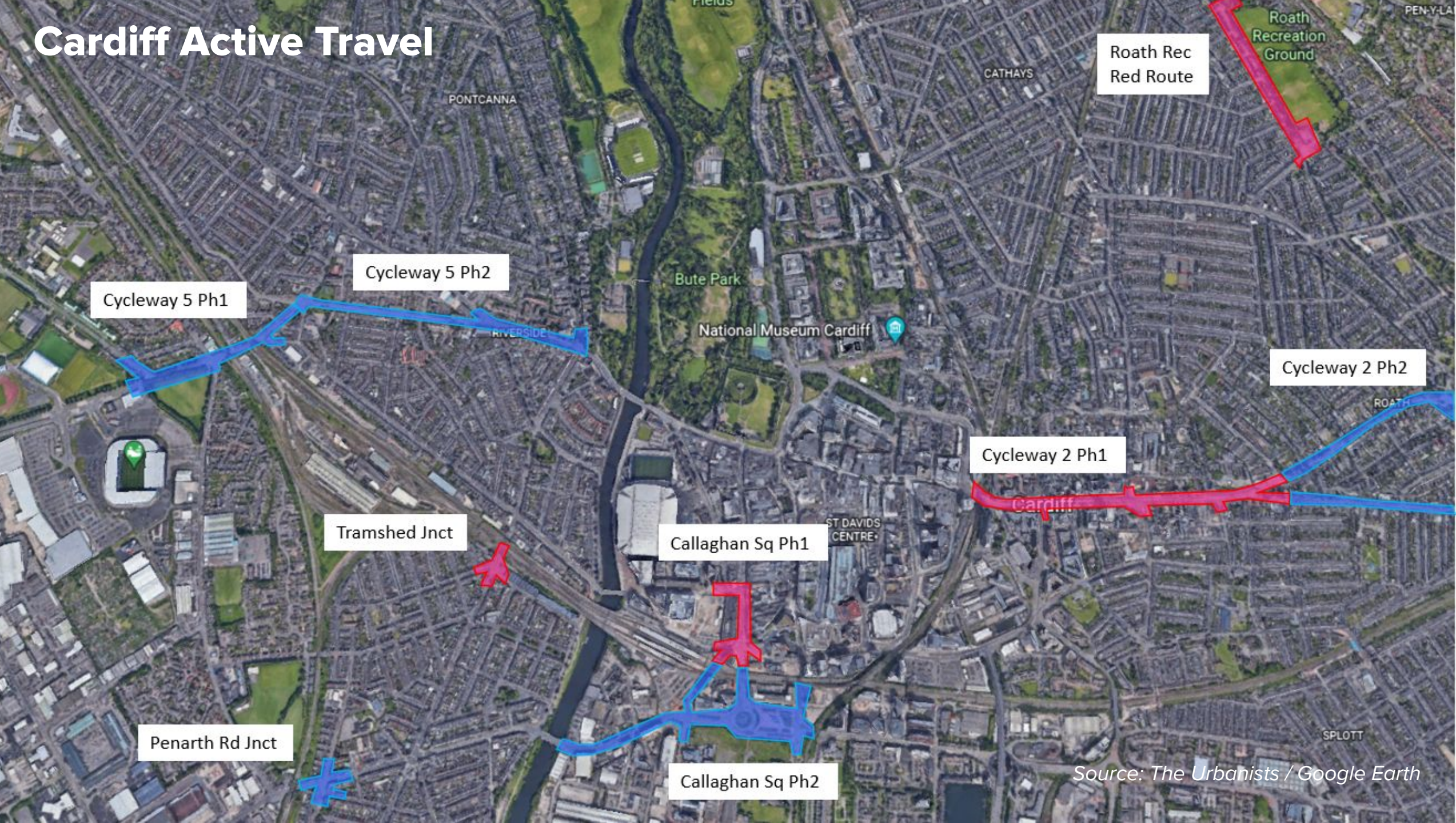


## Project Case Studies

- Cardiff Active Travel
- Cardiff Arena
- Kingsway Yard, Swansea
- Swansea Residential Site
- Llangollen Four Great Highways



# Cardiff Active Travel






Source: The Urbanists / Google Earth

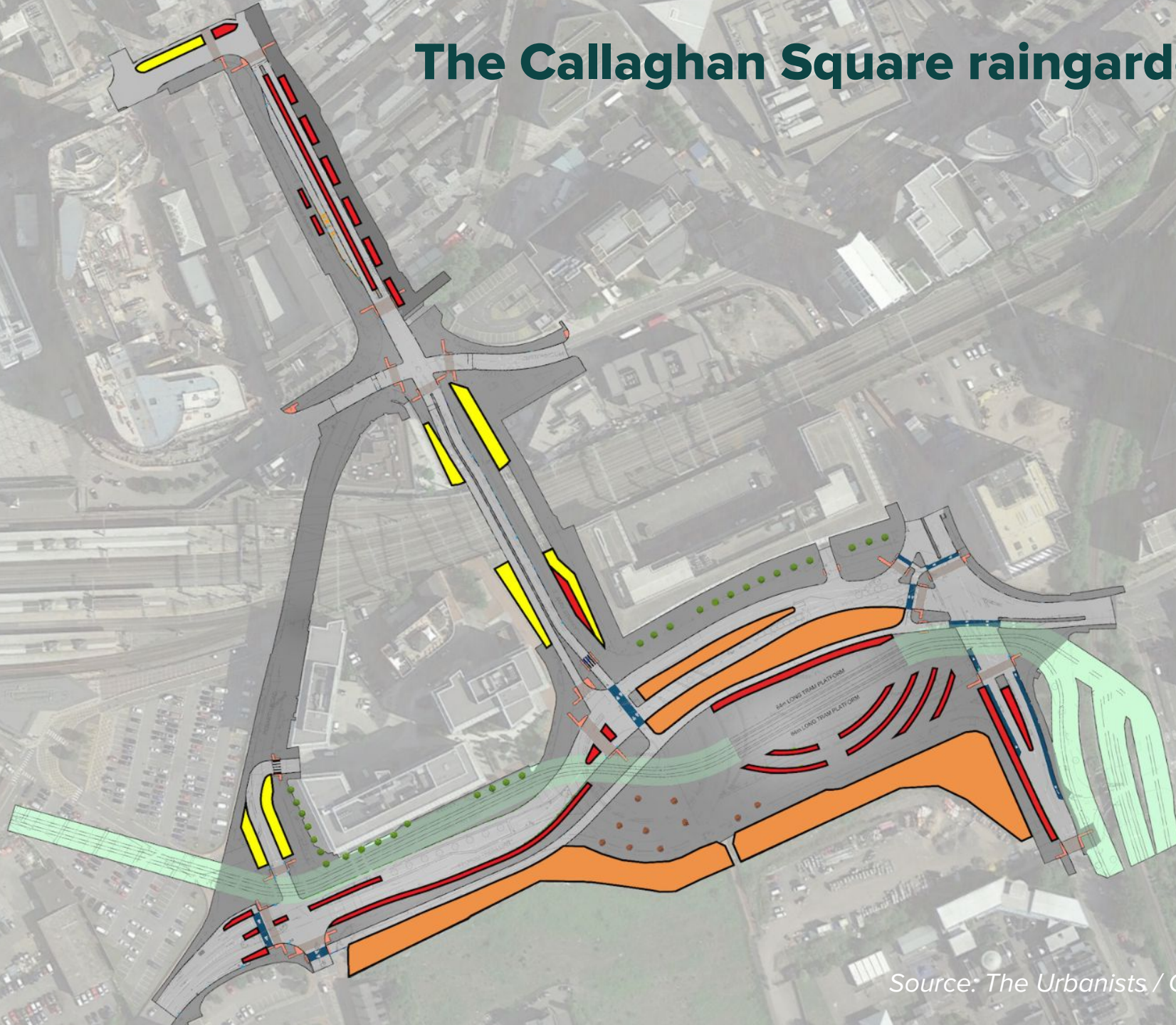



# The Callaghan Square raingardens

Legend

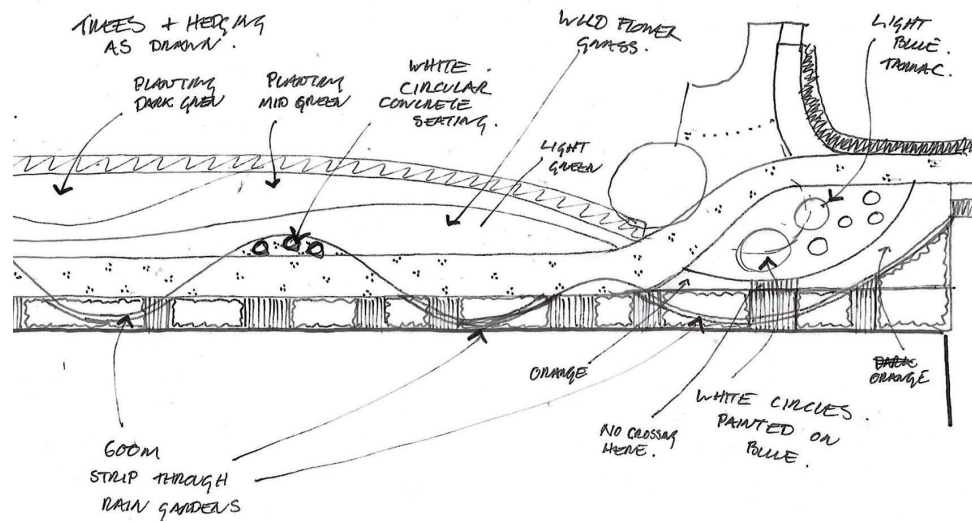
Typology 1	
Typology 2	
Typology 3	

Callaghan Square Rain Gardens (1:3000 @ A3)



Source: The Urbanists / Google Earth





## Shrubs & Herbaceous Planting:-

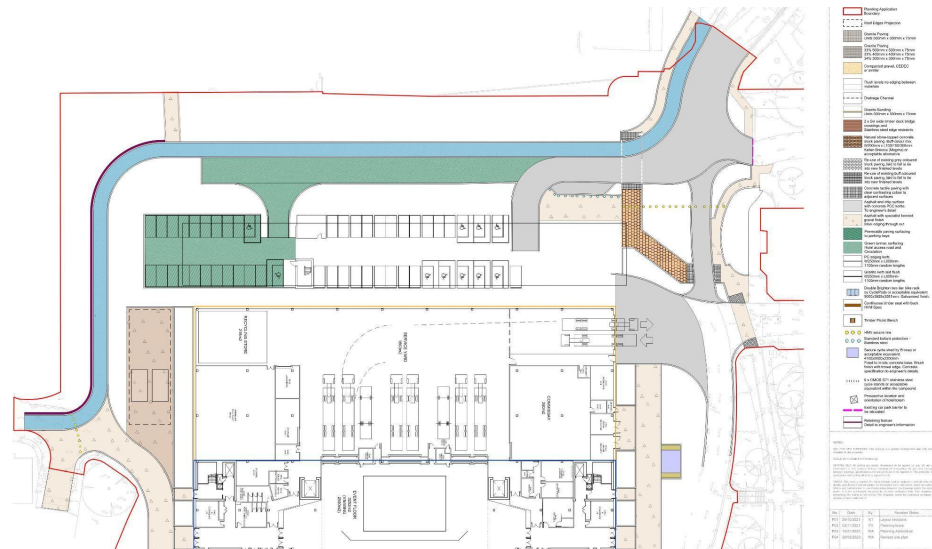
Allium aflatumense  
Anemone hupehensis var. japonica  
Deschampsia caespitosa "Goldschleier"  
Digitalis purpurea  
Dryopteris felix mas  
Libertia grandiflora  
Molinia caerulea  
Salvia 'May Night'  
Salvia purplespires  
Sisyrinchium striatum

## Climbing Plants:-

Hedera colchica 'Paddy's Pride'  
Hydrangea anomala subsp. petiolaris  
Parthenocissus tricuspidata 'Veitchii'  
Rosa 'Madame Alfred Carrière'  
Trachelospermum jasminoides

## Trees:-

Amelanchier-serviceberry  
Prunus-avium-Plena  
Zelkova-serrata

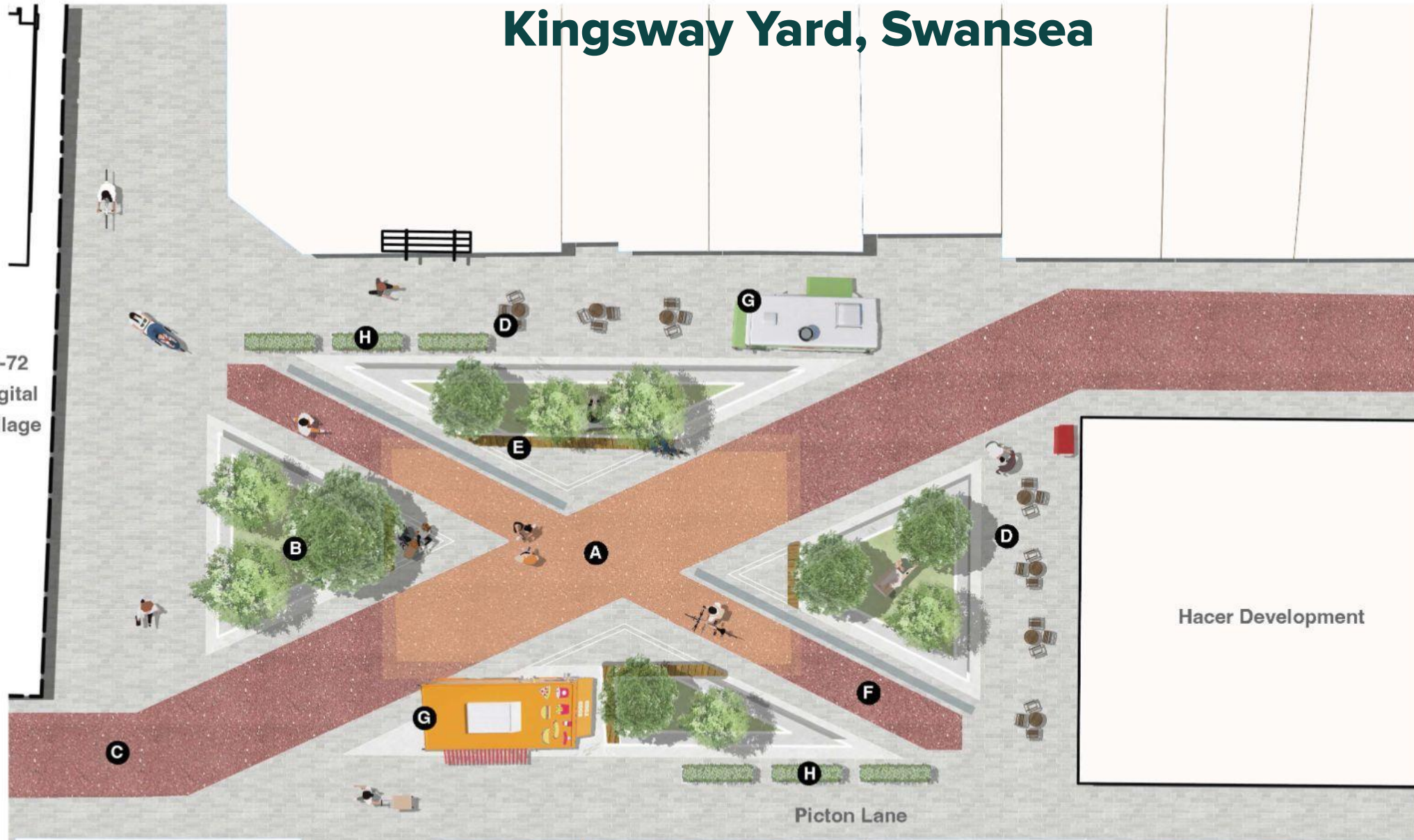




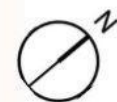
# Kingsway Yard, Swansea

## Key

- A** Central Square / Event Space
- B** Raised planters with trees and ground cover
- C** Feature paving and shared route
- D** Informal external seating backing buildings
- E** Formal seating around edge of Central Square
- F** Pedestrian route
- G** Vehicle drop-off / waste collection / mobile food and beverage unit
- H** Pleached Trees to form screen and add interest



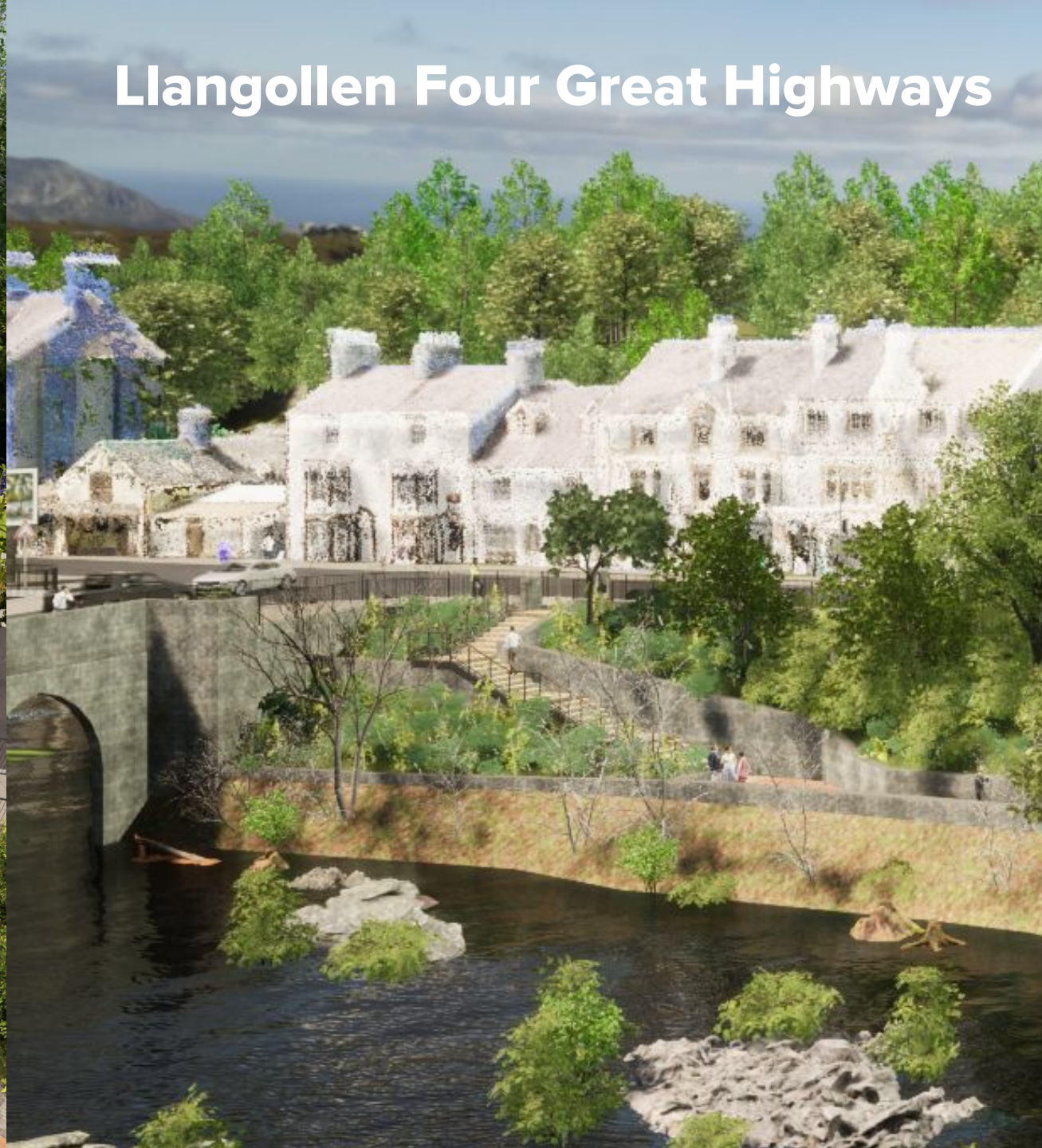
Source: The Urbanists







# Llangollen Four Great Highways





# Llewellyn Road Residential

theurbanists



Source: The Urbanists

Issues



**THANK YOU**

**Q&A**

**theurbanists**