Managing Flood Risk from New Developments in Partnership

26th September 2019

North West Regional Flood & Coastal Committee

United Utilities
helping life flow smoothly

Welcome

Tony Griffiths

United Utilities
helping life flow smoothly

Housekeeping

Take a moment to look around you and make sure your area is safe

No smoking

Hang up jackets and coats

Health and wellbeing

Fire alarms and exits

Toilets

Phones

United Utilities
helping life flow smoothly

Nothing we do is worth getting hurt for

Agenda

9.00 – 9.30	Arrival refreshments	
9.30-10.00	Welcome and housekeeping Opening video from our Chief Executive Officer Introduction from our Wastewater Network Business Manager	Tony Griffiths Steve Mogford Mike Wood
10.00 – 10.20	Question time	Sophie Tucker and Graham Morley
10:20 – 10:50	Our approach to development	Graham Morley
10:50 – 11:00	Refreshment break	
11:00 – 11:35	Playing our part in SuDS	Sophie Tucker
11:35 – 12:05	SuDS in partnership, an overview from our Merseyside Flood Risk Coordinator	Laura MaKeating
12:05 – 12:15	Questions for the presenters	All
12:15 – 13:00	Lunch	
13:00 – 13:30	Use of the SuDS opportunity mapping tool in Manchester	Zorica Todorovic
13:30 – 15:00	Breakout for workshops (Tea and coffee will be available half way through)	
15:00 – 15:25	Reflections from the day	Tony Griffiths and Sophie Tucker
15:25 – 15:30	Closing remarks	Graham Morley

United Utilities
helping life flow smoothly

Managing flood risk from new development in partnership

United Utilities

helping life flow smoothly

Introduction from our Wastewater Network Business Manager

Mike Wood

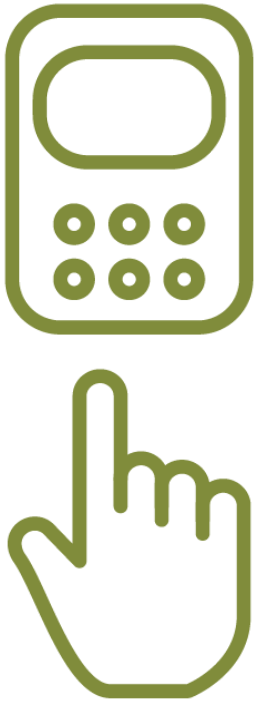
United Utilities
helping life flow smoothly

Question Time

Sophie Tucker and Graham Morley

United Utilities
helping life flow smoothly

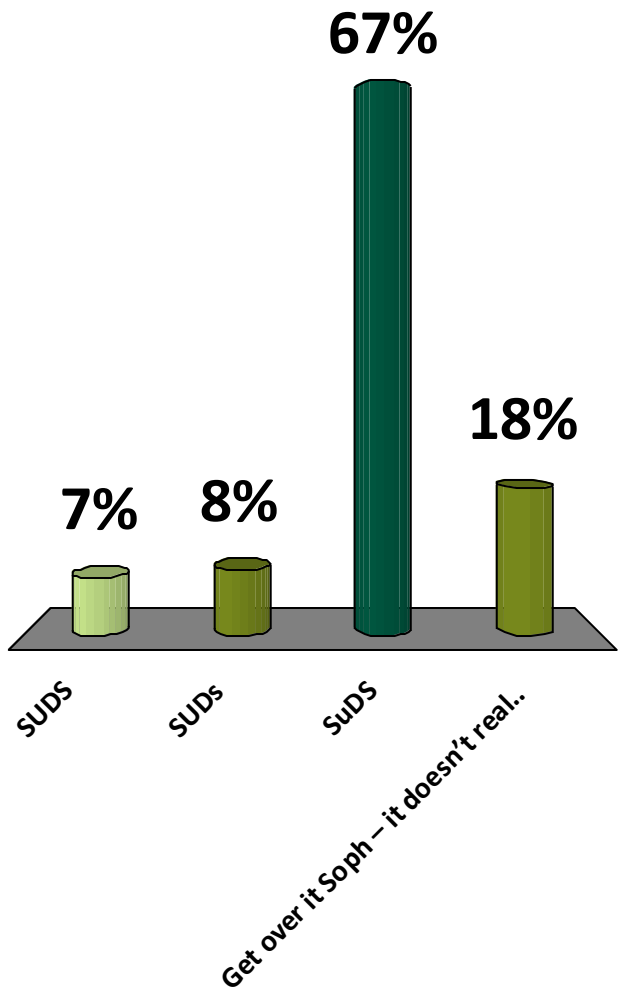
Time to vote...



- Press **GO, 4, 1, GO** to turn your key pad on
- It will flash red/green
- A question will appear on screen
- Select the letter of your preferred response
- Press the keypad – the green light will flash to record your vote
- You can vote twice and it will always take your last response

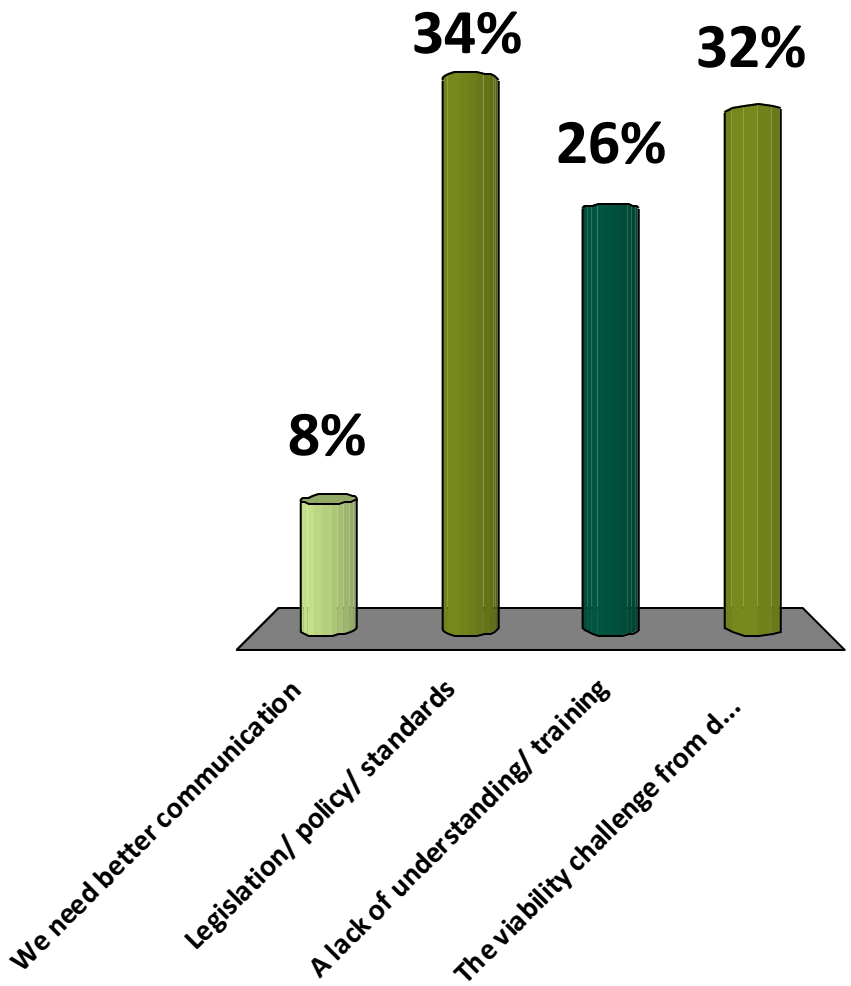
What is the correct way of using the acronym for sustainable drainage systems?

A. SUDS
B. SUDs
C. SuDS
D. Get over it Soph – it doesn't really matter



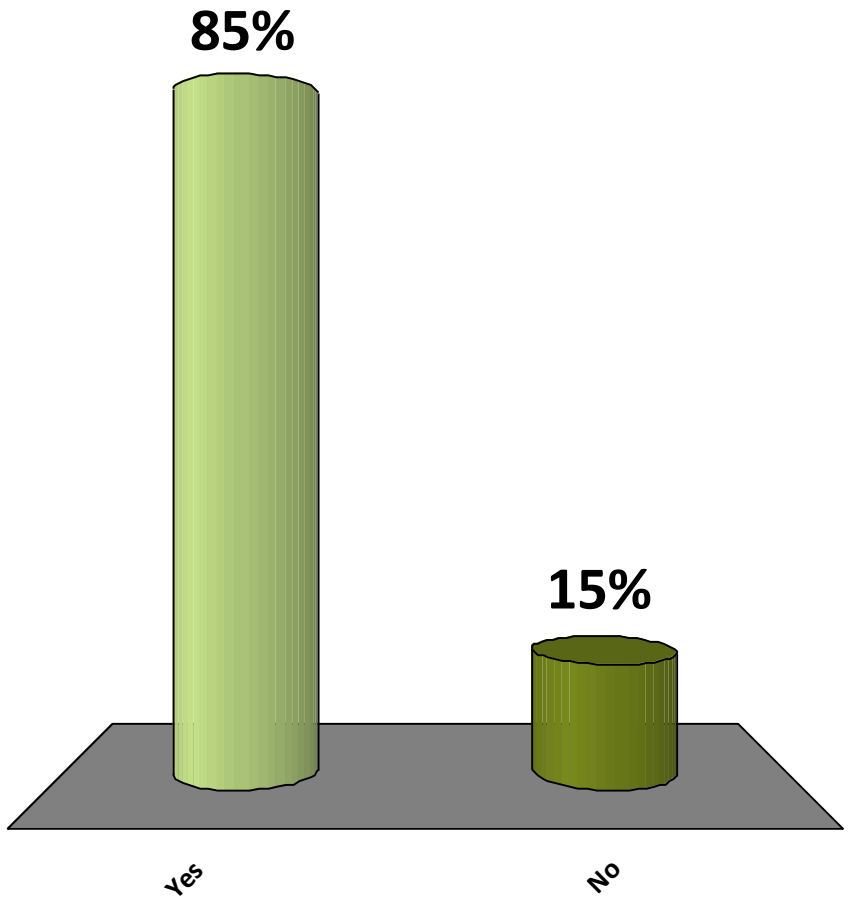
What do you think is the biggest challenge preventing us from delivering high quality sustainable development?

A. We need better communication
B. Legislation/ policy/ standards
C. A lack of understanding/ training
D. The viability challenge from developers



Are you familiar with the ‘hierarchy of drainage options’ for surface water, outlined within Planning Practice Guidance

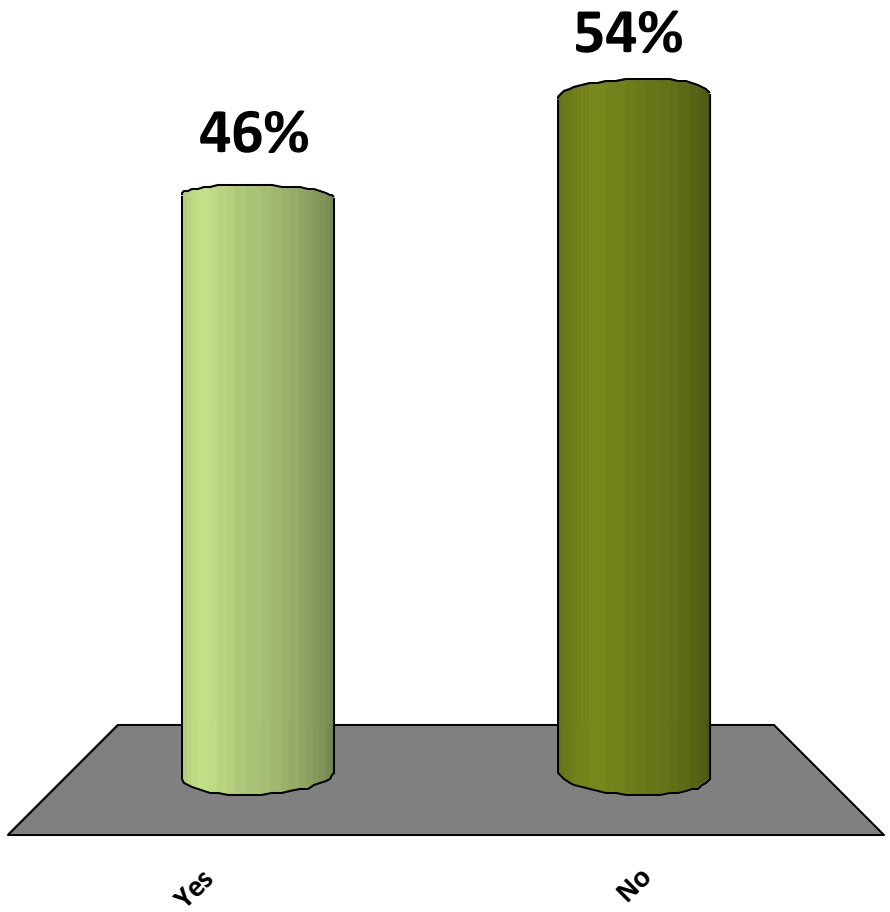
A. Yes
B. No



Did you know a similar hierarchy is detailed within the requirements section of Part H3 of the Building Regulations?

A. Yes

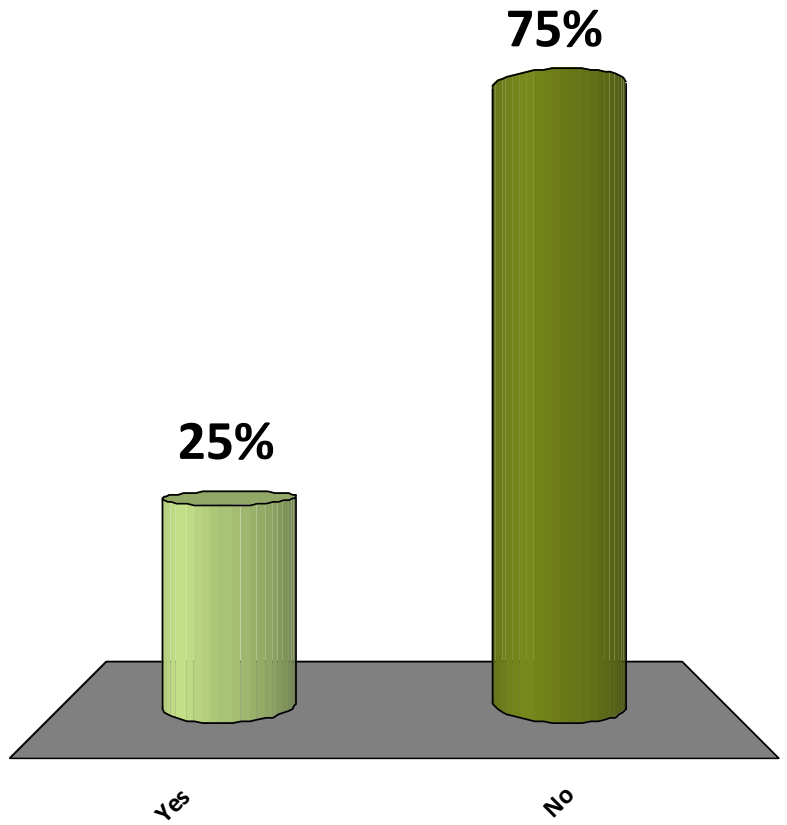
B. No



A developer applies to for a sewer connection; can United Utilities refuse the connection of surface water (draining buildings and yards)?

A. Yes

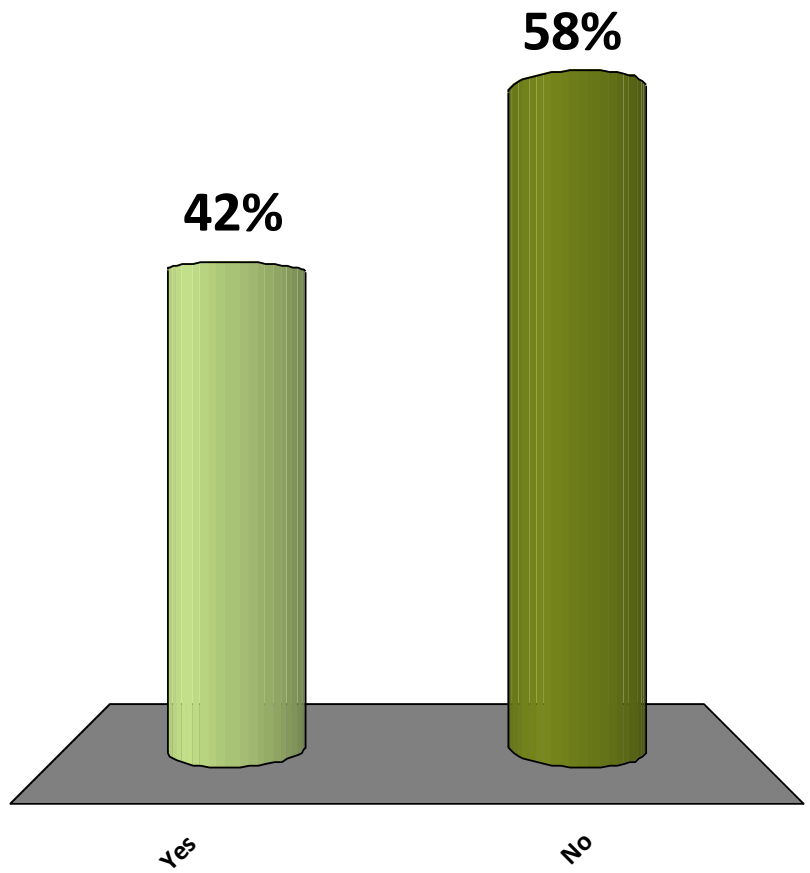
B. No



There is a mapped combined sewer outside the site and a surface water sewer 20m away. Can United Utilities insist that they connect their surface water (draining buildings and yards) to the surface water instead of the combined?

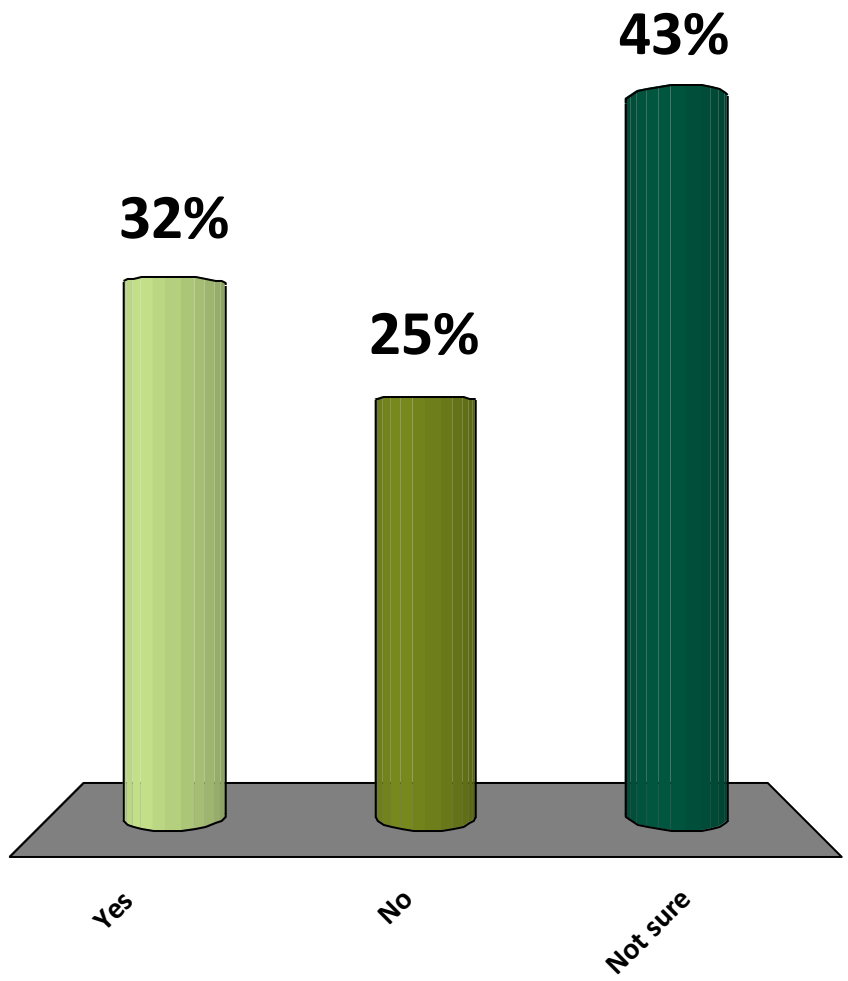
A. Yes

B. No



Has your local authority declared a climate emergency?

A. Yes
B. No
C. Not sure



Our Approach to Development

Graham Morley

United Utilities
helping life flow smoothly

United Utilities & New Development

- United Utilities Developer Services
- Development timeline & United Utilities interactions
- Key interactions –
    - Pre-development or ‘pre-planning’ advice
    - Planning process
    - Connection & adoption
- Challenges & opportunities

United Utilities
helping life flow smoothly

United Utilities Developer Services

Who are we?

Dave Briers

Head of Developer Services & Metering

Andrew Leyssens

Planning manager

Graham Morley

Technical Assurance Manager

Paul Heavey

Operational Delivery

6 Analysts

4 Planners

Stuart Edwards

Wastewater Technical Manager (pre-development)

Matt Watson

Wastewater Technical Manager (adoption)

Matt Yates

Wastewater Field Manager

6 Engineers

2 Asst. Engineers

8 Engineers

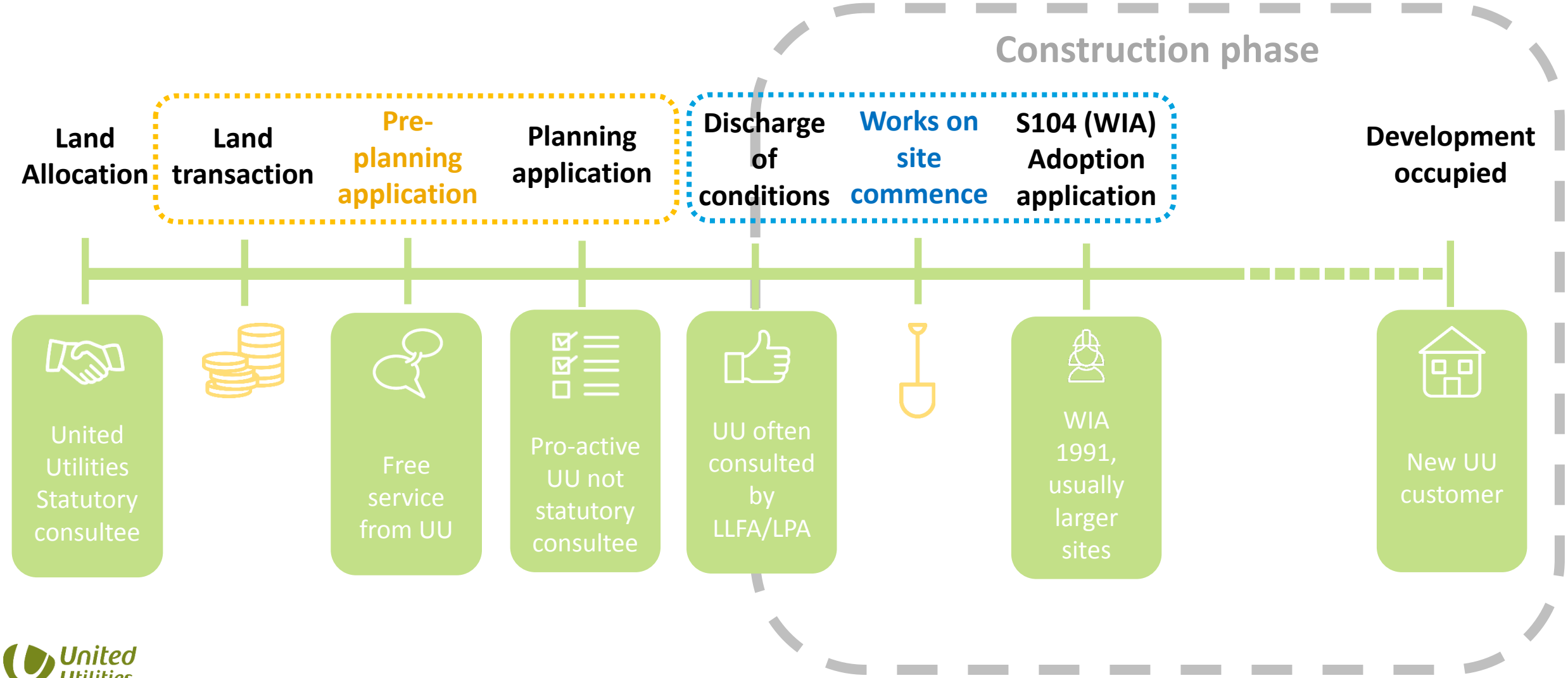
13 Inspectors

2 Asst. Engineers

United Utilities

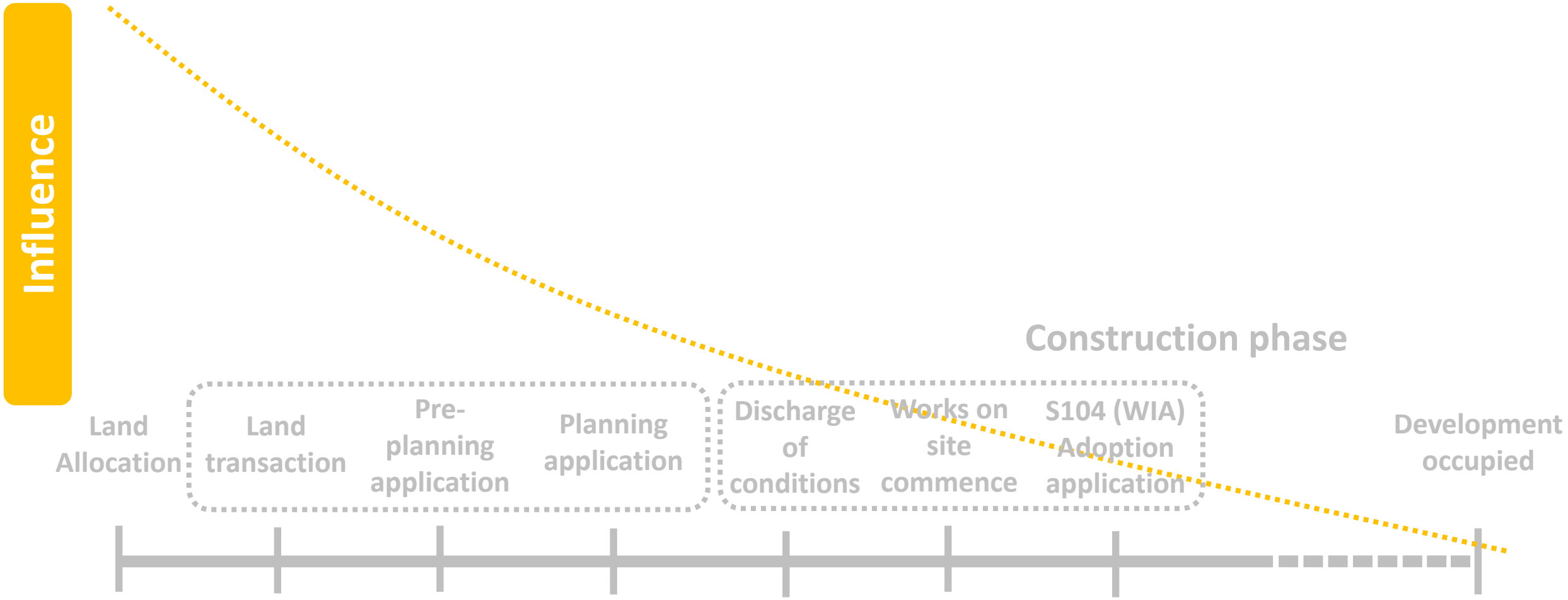
helping life flow smoothly

Development Timeline & United Utilities



United Utilities
helping life flow smoothly

Development Timeline & United Utilities



United Utilities
helping life flow smoothly

Key Interactions – Pre-development Advice

Free, voluntary service to our customers (Developers). Over **1200** applications received last financial year.

Opportunity for UU to influence **sustainable development** and agree drainage strategy, give the developer certainty.

Safeguard service to customers, challenge the application of the **surface water hierarchy**, asset protection, ground water protection, land near to wastewater works.

Gather **intelligence** and help inform us of likely investment requirements on our network.

United Utilities
helping life flow smoothly

Key Interactions – Planning Process

Responded to **129** strategic planning consultations (since April 2018) e.g. development plans, regeneration frameworks & masterplans.

Seen **20** LPAs since August last year, attended **48** planning liaison meetings since April last year and **37** master planning meetings.

Pro-actively reviewed over **5000** planning applications from Local Planning Authority weekly lists since April last year.

Gather intelligence and help inform us of strategic & capital investment opportunities.

United Utilities
helping life flow smoothly

Key Interactions – Adoption

Technically assessed **136** new sites with sewers for adoption this year (from April 2019).

24.1km of sewers adopted with **37** sewer diversions.

367 applications to connect to the public sewer.

1730 site inspections

United Utilities
helping life flow smoothly

Challenges & Opportunities

Water Industry Act 1991 S106, permission to connect foul & surface water

Regulatory determinations – point of connection

Adoption not mandatory in England

SuDS trial – influencing early

Ongoing **lobbying & stakeholder engagement**

Surface water drainage hierarchy – LPA the determining authority e.g. viability & brownfield sites

Delivery vehicles for large sites - 'joined up approach' vs. 'piecemeal development'

Current application of **design standards & skills gap**

National training

SuDS adoption – all or nothing approach

United Utilities
helping life flow smoothly

Time for a break...

United Utilities
helping life flow smoothly

Playing Our Part in SuDS

Sophie Tucker

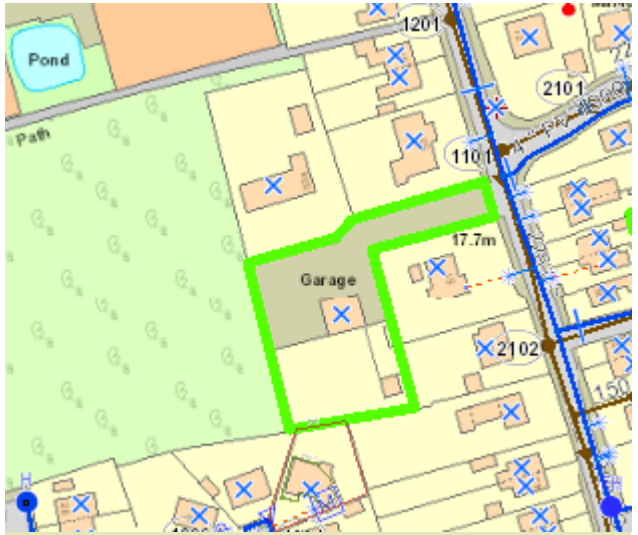
United Utilities
helping life flow smoothly

Flood risk from surcharging sewers

Part H1 of the Building Regulations, Surcharging of drains, paragraph 2.8;

'Combined and rainwater sewers are designed to surcharge (i.e. the water level in the manhole rises above the top of the pipe) in heavy rainfall. Some foul sewers also receive rainfall and therefore surcharge. For low-lying sites (where the ground level of the site or the level of a basement is below the ground level at the point where drainage connect to the public sewer) care should be taken to ensure that the property is not at increased risk of flooding. In all such cases the sewerage undertaker should be consulted to determine the extent and possible frequency of surcharge'.

Photo to show a property that is lower than the relative level of the road (just to help visualise the risk of surcharging sewers).



Green boundary showing the boundary for a minor development planning application

United Utilities
helping life flow smoothly

Surface water flooding

Threat

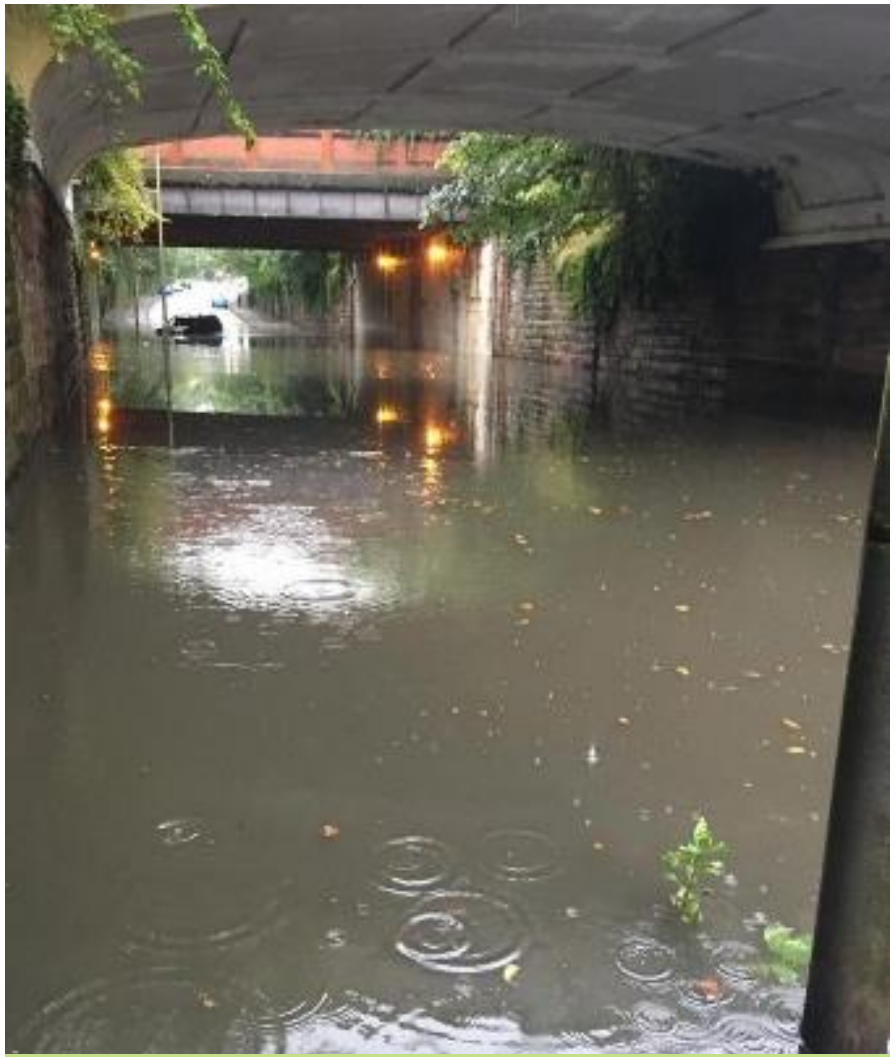
- **Increased peak surface water run off**
- Development (housing and commercial)
- Climate change causing intense rainfall
- Urban creep
- Land use change

Impacting

- **Resilience of all infrastructure and drainage assets**
- (Sewers, CSOs, pumps, highway drains, culverts, waterbodies)
- Health and safety

Leading to

- Flooding of properties and gardens
- Environmental impact
- Increased operation of network overflows
- Land erosion
- Asset deterioration



Photograph taken this week!

United Utilities
helping life flow smoothly

What are Sustainable Drainage Systems (SuDS)?

‘Sustainable drainage systems (SuDS) are a technical solution to the increasing problem of excess surface water. SuDS are always site specific, and require bespoke design that take into account the underlying hydrology, functional purposes of the area, and the present and future needs of people using the area’. [ICE, 2019]

Terminology isn’t great... They deliver so much more than drainage!!

Good design of SuDS is crucial as there is no ‘one size fits all’ solution. Often the best SuDS schemes and components are those that have involved a range of expertise (and the community) in their design. Planners play a vital role in involving the right experts at the right time ensuring SuDS are effectively integrated within the wider development. [Susdrain.org, 2019]

The inclusion of SuDS at the master planning or development site planning stage has a significant effect on the viability and cost-effectiveness of SuDS integration and the ability of SuDS to deliver multiple benefits. Master planning provides a strategic approach to consider the (sometimes competing) requirements for a development. [Susdrain.org, 2019]

In dry weather

Following a storm event

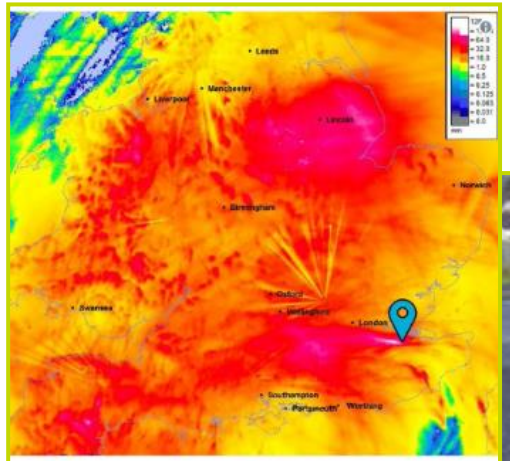
United Utilities
helping life flow smoothly

SuDS can help build climate resilient highways

Transport networks underpin a cities economic competiveness and society functioning.

Flooding, especially **surface water flooding** caused by intense rainfall, **is the predominant cause of weather-related disruption to the transport sector.**

'This radar map shows how widespread and heavy the rain has been. 104mm fell yesterday – easily more than a months worth of rain'



Environment Agency ✓
@EnvAgency

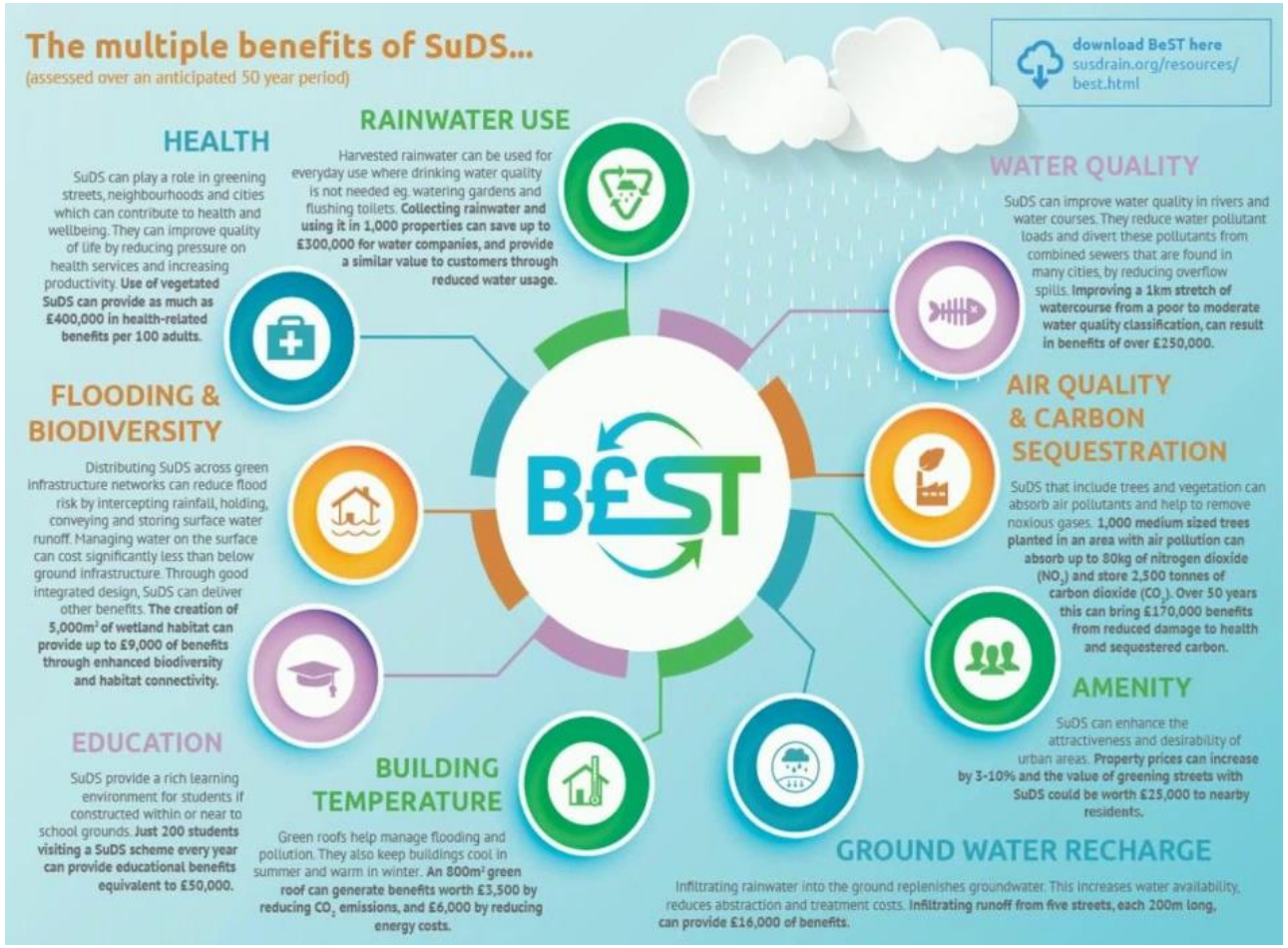
This radar map by our Flood Forecasting Centre shows how widespread and heavy the #rain has been. In Kent 104mm fell yesterday – easily more than a month's worth of rain! As it continues you should check your flood risk: bit.ly/1GwYNZH #floodaware #prepareactsurvive

♡ 17 11:51 AM - Jun 11, 2019

United Utilities
helping life flow smoothly

SuDS can help deliver nice places

Multiple drivers, multiple benefits



Sustainable economic development	High quality & inclusive design
Regeneration	Protect and enhance the environment
Town/ city resilience	Natural capital
Biodiversity net gain	Low carbon
Place making	Developing communities

United Utilities
helping life flow smoothly

Retrofitting SuDS

Case study - Queen Caroline Estate, Hammersmith, London

- Existing condition – unrestricted discharge, poor amenity value

susdrain

What is susdrain?

A range of resources for those involved in delivering sustainable drainage, water sensitive urban design etc.

What are your observations? (I think it looks quite grey)!

Some green space that you could potentially enhance?

United Utilities
helping life flow smoothly

Retrofitting SuDS

Case study - Queen Caroline Estate, Hammersmith, London

- Existing condition – unrestricted discharge, poor amenity value

Green Roofs to existing garages

Main Swale

Detention Basins

Swale and Food Growing Areas

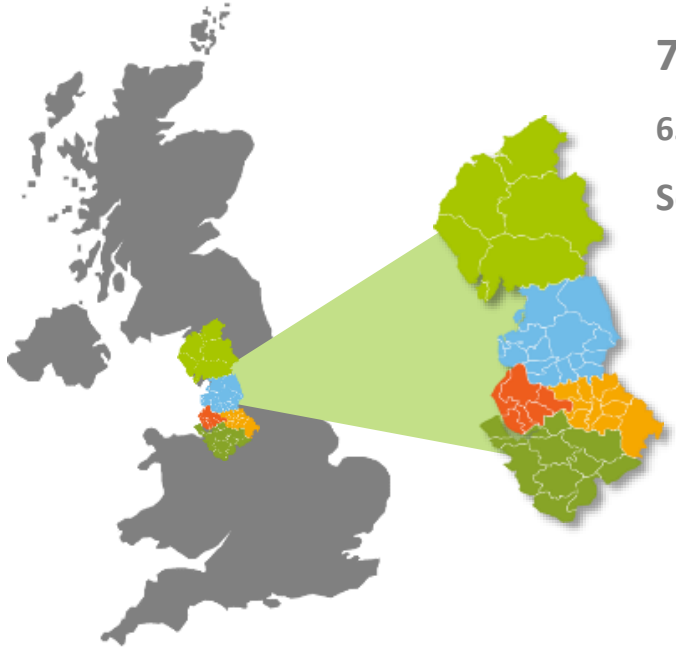
United Utilities
helping life flow smoothly

Why else may we wish to integrate SuDS?

Delivering Natural Capital in the area that we serve

'Regeneration is an holistic process which aims to reverse the economic, social and physical decline of places where market forces alone will not suffice. The RTPI believes the spatial planning system should be placed at the heart of regeneration. The planning process provides the opportunity to enhance the role and capacity of communities as well as balancing community, business, environmental and individual needs. Effective regeneration requires active and meaningful long-term community engagement and involvement, as well as changes to the physical environment'.

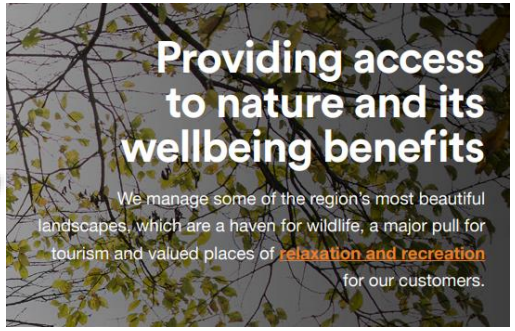
RTPI
Royal Town Planning Institute

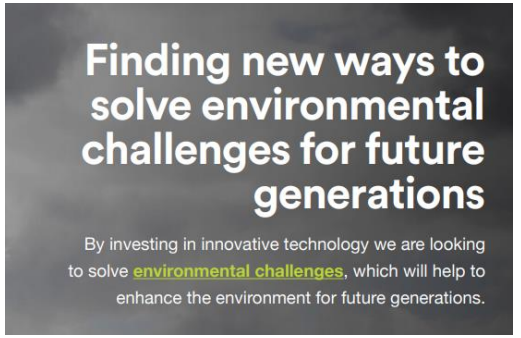


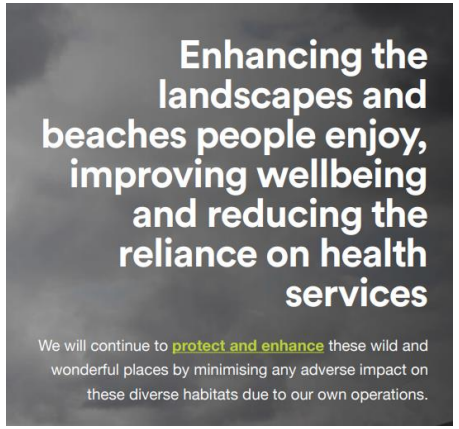
7 million household customers, with only **3.4 million** in employment

650,000 receive benefits with thousands more on universal credit (>30% of total in UK)

Serve 10 of the top 20 most deprived areas in England







United Utilities
helping life flow smoothly

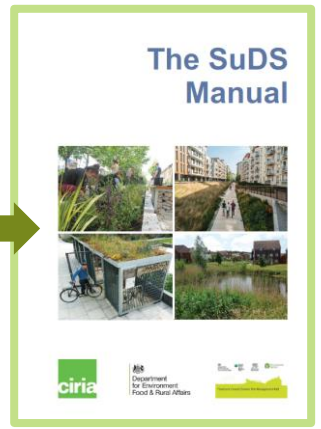
Water Company Adoption in AMP 7 (from April 20)

Housing developments

Following the publication by Water UK of a revised version of Sewers for Adoption, dubbed SfA 8, the substance of the text has now been used as the basis for the **Design and Construction Guidance document** (DCG) which is being recommended to Ofwat as part of the water sector's work to implement Ofwat's adoption code. The DCG, which can be found here, sets out standards and provides guidance for developers on the design and construction of sewers and related features that will be adopted by water and wastewater companies in England in accordance with Section 104 of the Water Industry Act 1991.

Ofwat is currently considering the DCG and other documentation presented by water companies. **Water UK have proposed** that given the extent of changes resulting from the new approach, this should be **effective as from 1 April 2020**. A major change in the new guidance is that for the first time, guidance has been provided on **SuDS which are adoptable as sewers**. No significant changes are anticipated to the "SuDS" elements of the DCG.

SfA 8/ DCG



Nothing stopping LPA checking for compliance with CIRIA C753 to enable retrospective adoption post April 2020 (via S102 application).

Note: adoption by Water Companies will remain voluntary in England.

United Utilities
helping life flow smoothly

Water Industry - facilitating adoption of SuDS

What do you picture when you think of a surface water sewer?

Traditionally thought of as a pipeline?

The Pre-implementation version of SfA 8 explains that a number of **SuDS components can come within the meaning of a "sewer"** in accordance with the WIA 1991, and therefore is potentially adoptable, if all of the following apply:

a) it is constructed for the **drainage of buildings and yards appurtenant to buildings**;

b) it has a channel (a depression between banks or ridges with a definite boundary);

c) it conveys and returns **flows** to a sewer or to a surface water body or to groundwater; and

d) it has an effective point of discharge, which must have **lawful** authority to discharge into a watercourse or other water body or onto or into land. As with conventional piped systems, this right to discharge must be secured by the developer and transferred to the water company on adoption.

United Utilities
helping life flow smoothly

Adoptable component types

The images below show SuDS component types, described as being potentially adoptable within the DCG.

Note: Images from CIRIA C753 The SuDS Manual.


Swales

Rills


Bio-retention systems

Ponds & wetlands

Basins

Infiltration basin/ trench

Filter drains

- Under Section 94 of the WIA 1991, WaSCs have a statutory duty to ***cleanse and maintain*** **sewers** ***as to ensure that area is and continues to be effectually drained***.

United Utilities vested public sewer

(Retrospective adoption of infiltration basin at Dalston, Carlisle)

Designed to attenuate surface water runoff for 100 year + climate change event

No clear adopting body when development approved at planning (basin was to remain in private ownership with our sewers, serving 115 properties)

UU responsible for infiltration media and maintenance of the ancillaries (catch pits and headwalls) to ensure SuDS can effectually drain in perpetuity

Entered into a Deed of Grant with land owner (Land not owned by UU)

Opportunity for further enhancement if wider design objectives where included within the scope

United Utilities
helping life flow smoothly

Example trial adoption site designed to CIRIA C753
(under construction)

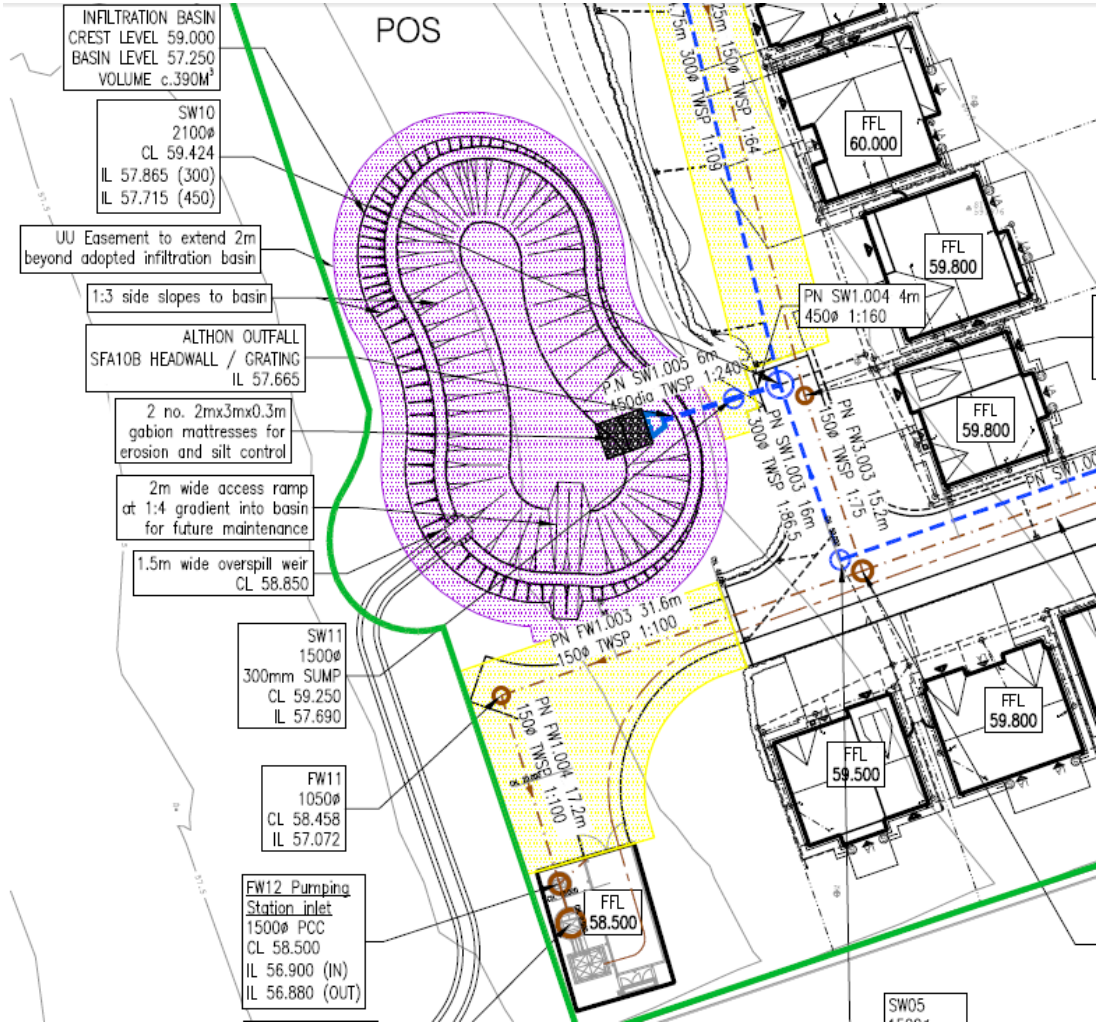
Health and safety

Visible and overlooked by properties

Dry feature – only holds water during storm
Depth <0.4m deep in 2 year return period, <1.4m deep in 100 year return period

Slope compliant with Minimum Design Standards

Safety signage sufficient (does not require safety fencing)



Maintenance

SUD arrangement built into UU Asset Data Hierarchy (ADH) coding for SuDS ancillaries

Ancillaries including headwall, catch pits, infiltration media to be maintained by UU to effectually drain

Deed of Grant collected where shaded purple.
Aesthetics of the landscape within the control of the landowner

Level monitoring proposal in development (data capture & long term performance monitoring) for infiltration systems

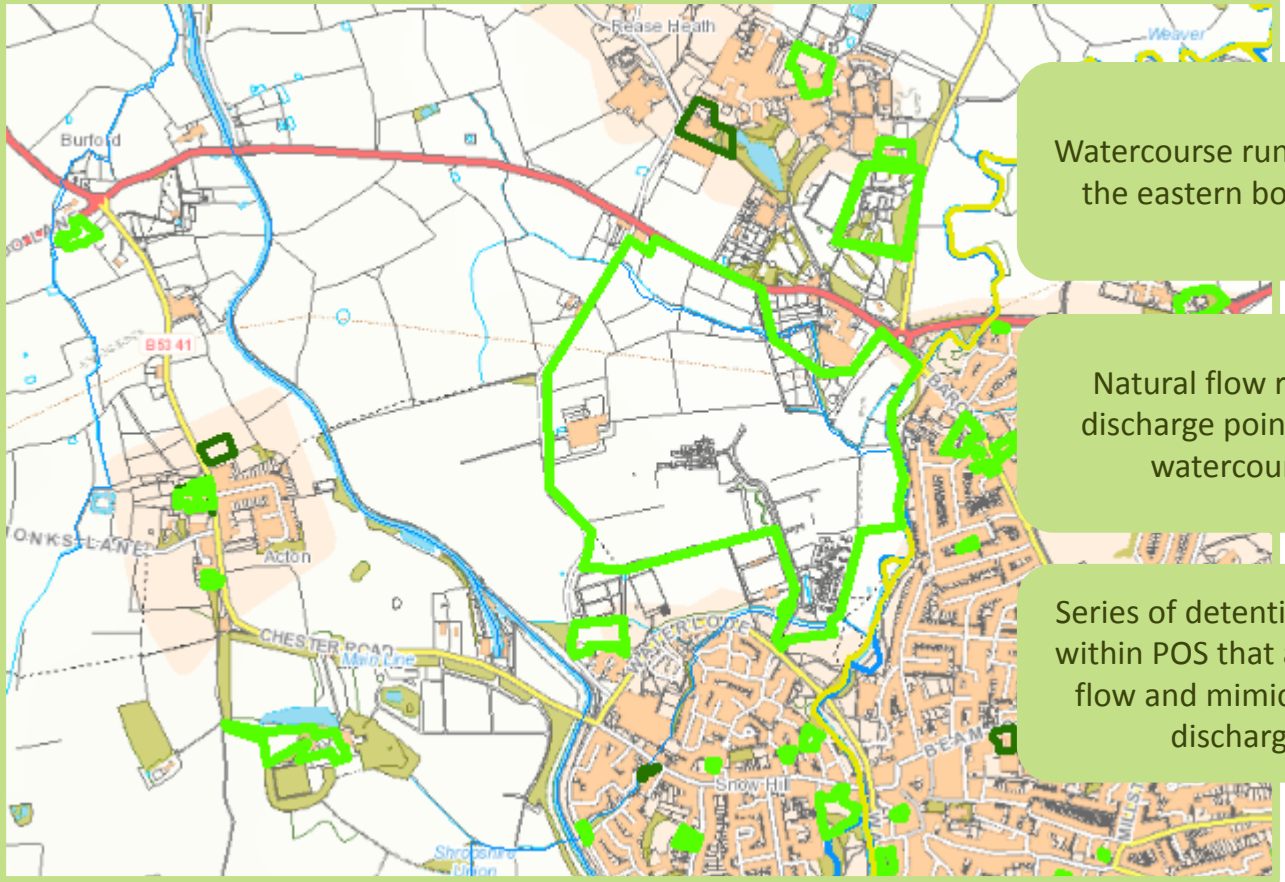
United Utilities
helping life flow smoothly

Example trial adoption site designed to CIRIA C753

(Multi-venture, under construction)

Photos showing two detention basins - part of phase 1 (site under construction)

1,000 unit development



Watercourse runs close to the eastern boundary.

Natural flow route & discharge point to this watercourse

Series of detention basins within POS that attenuate flow and mimic natural discharge

- Good example of coordinated infrastructure delivery with multiple developers?
- What tools and delivery vehicles have LPA's got to ensure a coordinated approach?

United Utilities
helping life flow smoothly

Example SuDS pond designed to CIRIA C753

DCWW adoption

Maintenance

Sediment forebay with engineered base – for ease to desilt (bi-annually)

Accessible, vehicle parking at turning head and within pump station compound

Water Company (Risk Management Authority) responsible to ensue SuDS can *effectually drain*

SuDS design provided connectivity to nature reserve with steps down outfall to watercourse. This was a requirement of planning for biodiversity, as well as making the amenity accessible to homeowners

Health and safety

Visible and overlooked by properties

Fencing to prevent toddler access, however gate can be opened to access the amenity

Pond with holds permanent holds water during storm Permanent water depth and maximum attenuated depth both limited within CIRIA C753 design guidance for safety

Slope compliant with Minimum Design Standards

United Utilities
helping life flow smoothly

In summary - we've started to play our part in adoption

…but we're on a journey and have a lot to learn

- We've launched a SuDS trial in Merseyside and Cheshire East
- Learning of the SuDS project has informed this approach
- Adoption will be business as usual from April 2020 when we work to the DCG (we're building our capability)

Cautionary note;

- We still don't have a legal basis to adopt SuDS, but adopting as 'sewers' we can ensure it effectually drains – accountability from a flood risk management authority
- Remember though, adoption remains voluntary! (Planners and LLFA's will be determining sites that may not be offered for adoption, and all need to be mindful of that).
- Adoption has been stated as a barrier, but I don't think introduction of the DCG is the answer – the planning system will remain key to delivery of SuDS!

United Utilities
helping life flow smoothly

The planning system is so important to deliver SuDS
(From new development)

- Unlike owners of watercourses & canals, sewerage companies do not have an absolute right to refuse connection of surface water to public sewer
- We are reliant on planning system to:
    - control full investigation of hierarchy of drainage options;
    - control receiving body;
    - control rate of discharge; and
    - **ensure delivery of SuDS!**

What sort of sustainable drainage system should be considered?

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

Applying hierarchy of drainage options not the same as including sustainable drainage!
A site can include sustainable drainage but discharge to lowest priority.

Why is surface water drainage often regarded as 'detail' to be sorted later?
It needs to be regarded as a material consideration and an inherent part of the design process.

United Utilities
helping life flow smoothly

Discussion

Recent planning interaction within Greater Manchester

- Change of use - conversion of two mills into apartments ≈ 300 units
- Located within a high risk drainage area
- Existing connectivity to the combined sewer
- ✓ Opportunity to deliver quality blue/ green infrastructure
- ✓ Opportunity to ensure “betterment” beyond rate of discharge

Reservoir for the mills.

- Opportunity to use rainwater as a resource?
- mimic a harvesting approach for building management services?

Existing vegetated strip at the side of the building, could this be re-profiled as a conveyance swale?

United Utilities
helping life flow smoothly

What SuDS could be incorporated?

Referring to case studies on www.susdrain.org

Buckland House Car Park, Hampshire

Queen Caroline Estate, London
(shown on previous slides)

Exwick Heights School, Exeter

Greening streets, retrofit rain gardens, Nottingham

United Utilities
helping life flow smoothly

An insight into the work we've done with UU property

- We've engaged with UU property to understand the process for our land disposals for development

- They now understand our challenges, and are undertaking better investigations; e.g. infiltration testing and engagement with riparian owners

- What's our aim? To think about and include sustainable drainage principals in the terms of sale

Is there an opportunity for you to engage with your estates teams to follow a similar approach, Local Authority owned land for development?

United Utilities
helping life flow smoothly

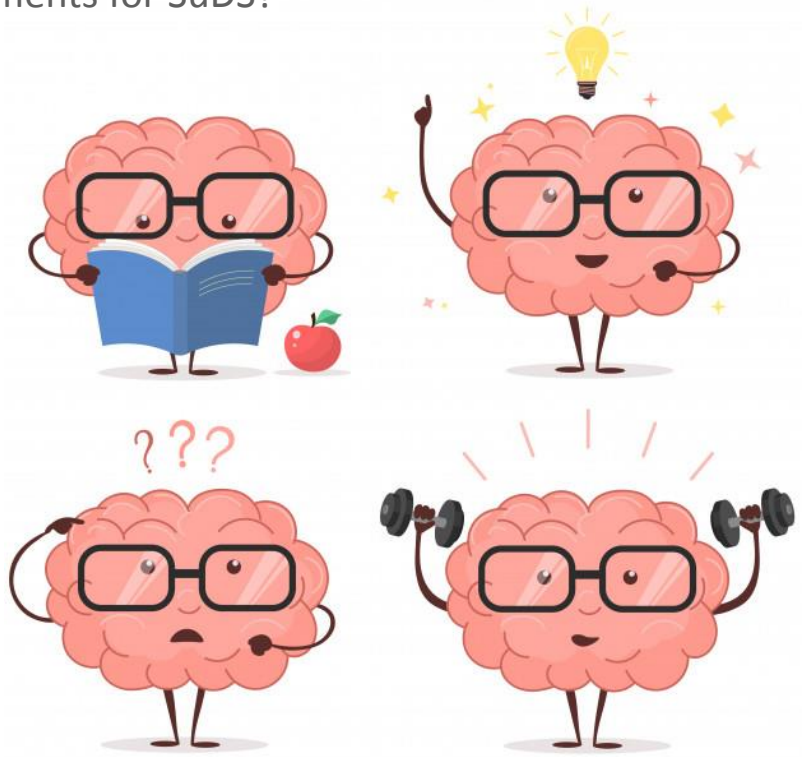
Some of my thoughts to finish

How we can drive better water management

Stronger Local Policies
Strengthen requirements for SuDS?

Work together as trusted partners to get the best outcome
Cheshire/ Merseyside SuDS Trial

Access to better guidance, training and case studies
UU are leading on the development of industry training, and we're looking at ways to share learning across the region



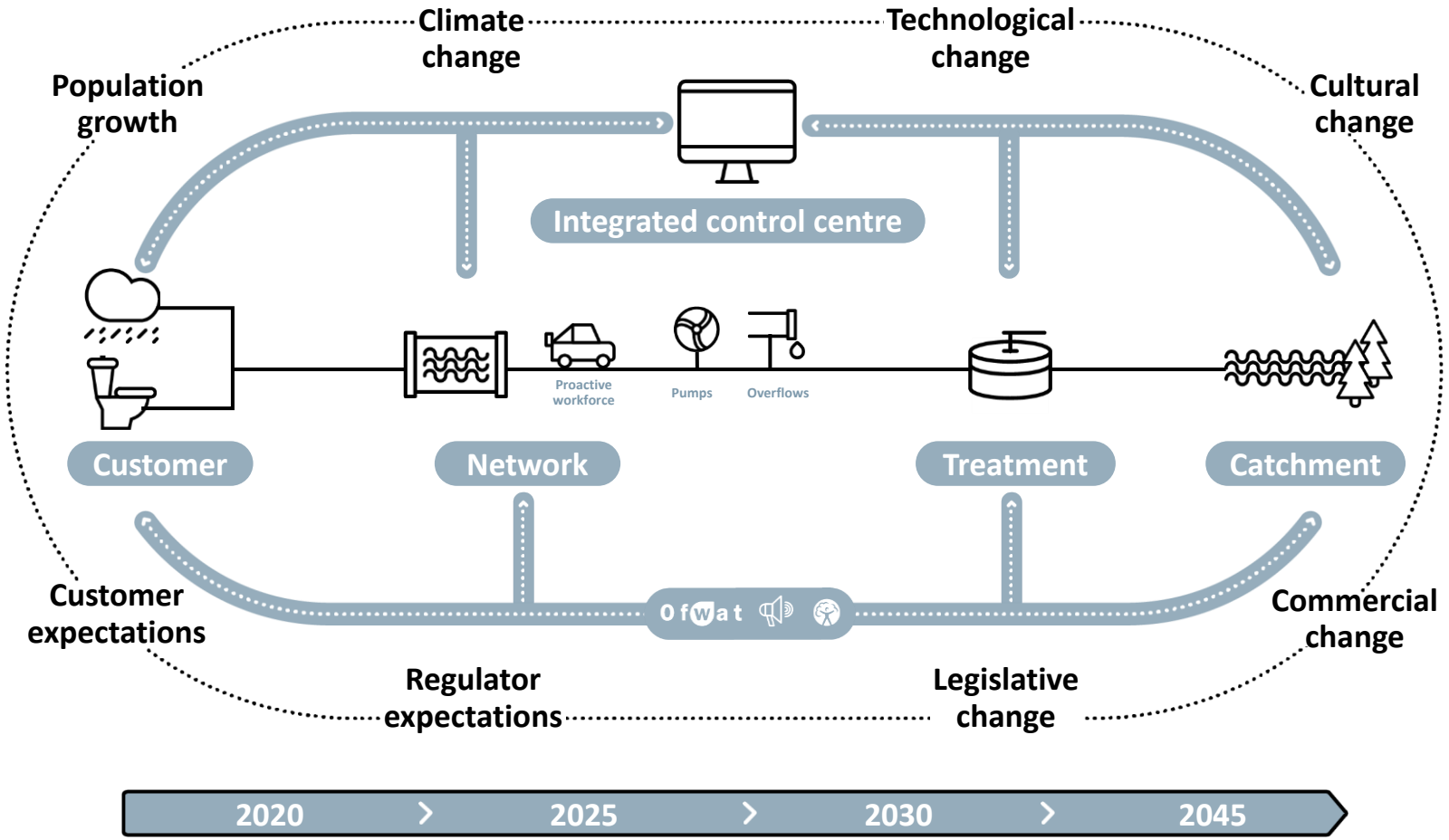
The default position needs to change, lets manage rainwater on the surface!
Integrated design approach between landscape and drainage is essential.

Is the terminology helpful?
Big focus on 'drainage'
Drainage relates to wastewater…
But it's a valuable resource!
Can we improve our comms/ develop a campaign utilising the flood hub?

A more strategic approach should help us to deliver more SuDS
Drainage and Wastewater Management Plans (DWMP)
Catchment Systems Thinking (CaST)

THE FLOOD HUB

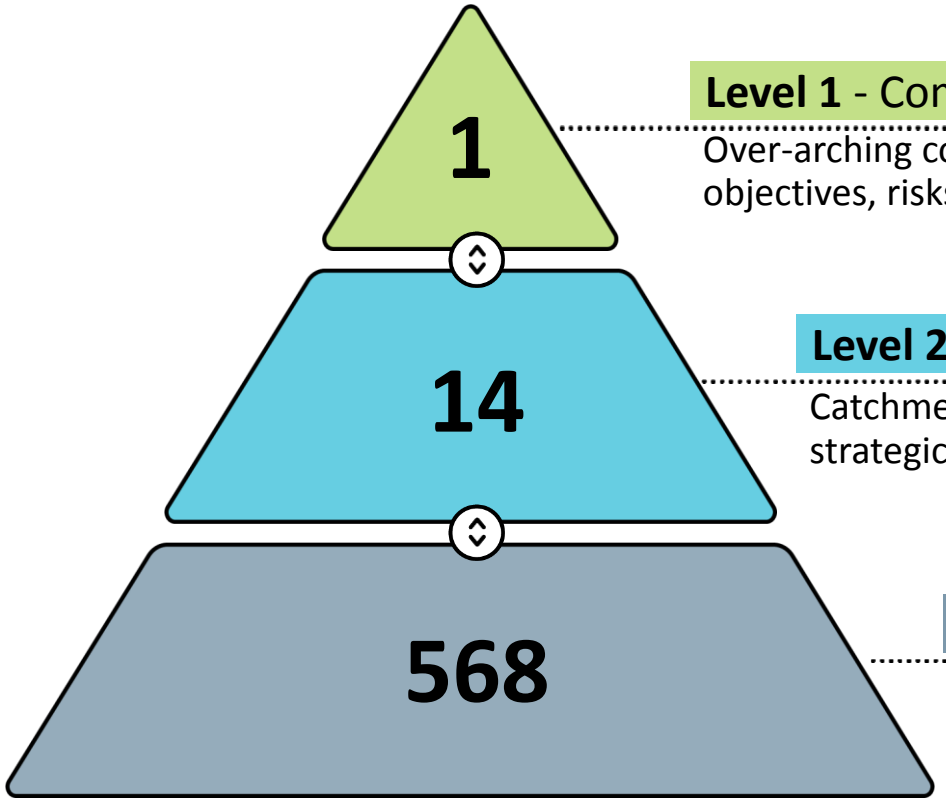
Considerations of DWMP



Some of you may be involved in the DWMP workshops being held in October?

United Utilities
helping life flow smoothly

How DWMP will be structured



Level 1 - Company

Over-arching company wide plan which sets out key company objectives, risks faced and summarises investment needed

Level 2 - Strategic planning area

Catchment plans co-created with stakeholders through strategic planning groups at a River Basin level

Level 3 - Tactical planning unit

Drainage area plans which assess how future changes will affect catchment performance and steps that need to be put in place to manage

United Utilities
helping life flow smoothly

SuDS in partnership

Laura MaKeating

United Utilities
helping life flow smoothly

Sustainable Drainage Systems (SuDS) in Partnership

Laura Makeating
Merseyside Flood Risk Coordinator

United Utilities
helping life flow smoothly

North West Regional Flood & Coastal Committee

Overview

- Journey so far
- Importance of Planning and Planners
- Challenges and lessons learnt
- Opportunities
- Ambitions and new ways of working
- New horizons

The journey so far…

Timeline of events

2007-10

- Summer 2007 floods
- The SuDS Manual (C697) (2007)
- PPS25 (2009)
- Flood & Water Management Act (FWMA)

2012

- NPPF launched
- **New homes built after 1 January 2012 not eligible for funding to resolve flooding**

2015

- HCWS 161
- Technical Standards for SuDS
- The NEW SuDS Manual (C753)

2018/19

- Schedule 3 FWMA introduced in Wales (SAB)
- 25 Year Environment Plan
- Revised NPPF

2020

- NEW Sewer Adoption Code - Design and Construction Guidance (DCG)
- Biodiversity Net Gain

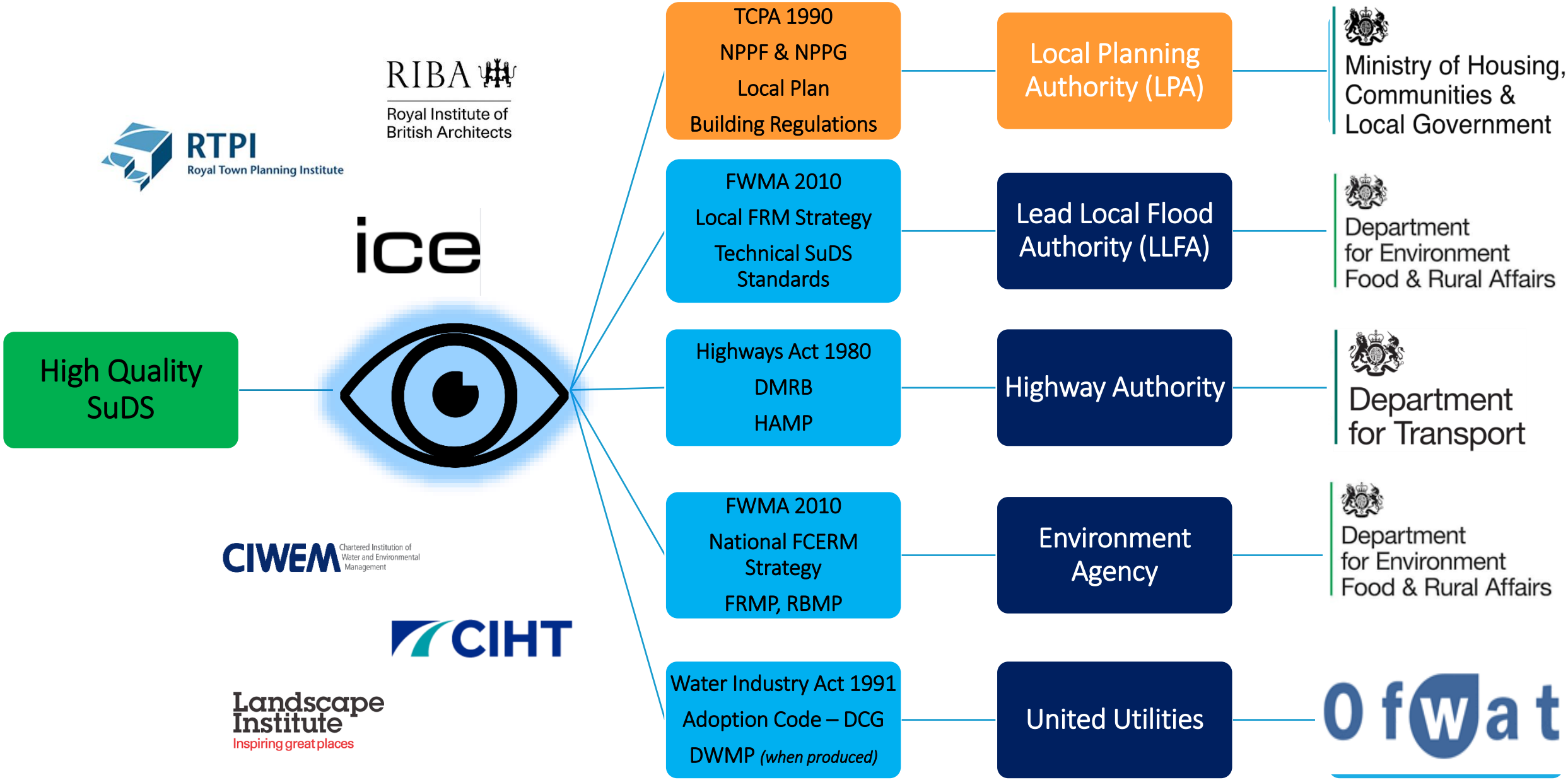
Adoption Code DCG

2020 Onwards: Working better together

Why now?

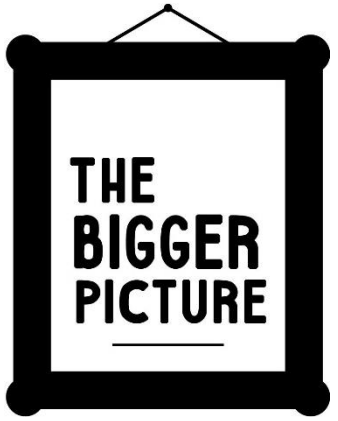
- Design and Construction Guidance (DCG)
- Climate Emergency
- Growth Agenda (Devolution)
- Natural Capital (Biodiversity Net Gain)
- Frequent Events = Greater Public Awareness

SuDS = Part of the Solution


RIBA
Royal Institute of British Architects
RTPI
Royal Town Planning Institute
ice
CIWEM
Chartered Institution of Water and Environmental Management
CIHT
Landscape Institute
Inspiring great places
High Quality SuDS
TCPA 1990
NPPF & NPPG
Local Plan
Building Regulations
Local Planning Authority (LPA)
Ministry of Housing, Communities & Local Government
FWMA 2010
Local FRM Strategy
Technical SuDS Standards
Lead Local Flood Authority (LLFA)
Department for Environment Food & Rural Affairs
Highways Act 1980
DMRB
HAMP
Highway Authority
Department for Transport
FWMA 2010
National FCERM Strategy
FRMP, RBMP
Environment Agency
Department for Environment Food & Rural Affairs
Water Industry Act 1991
Adoption Code – DCG
DWMP (when produced)
United Utilities
Ofwat

Ian Tant – RTPI President

Planning Rules



Critical role in flood and water management!

- ✓ Potential to cause new or worsen existing flood risk
- ✓ Potential to increase the number of properties at risk of flooding

These new properties are NOT eligible for government funding to resolve flooding issues

- ✓ Increase or change the vulnerability of users where there is a change of use to a more flood vulnerable use class e.g. from offices to flats.
- ✓ Ensure development proposals satisfy National, Local and Neighbourhood Plans.
- ✓ See bigger picture – BGI, regeneration, transport, Biodiversity Net Gain
- ✓ Planning Permission (and enforcement) – **FINAL SAY!**

Site allocation near Whalley, Ribble Valley, December 2015

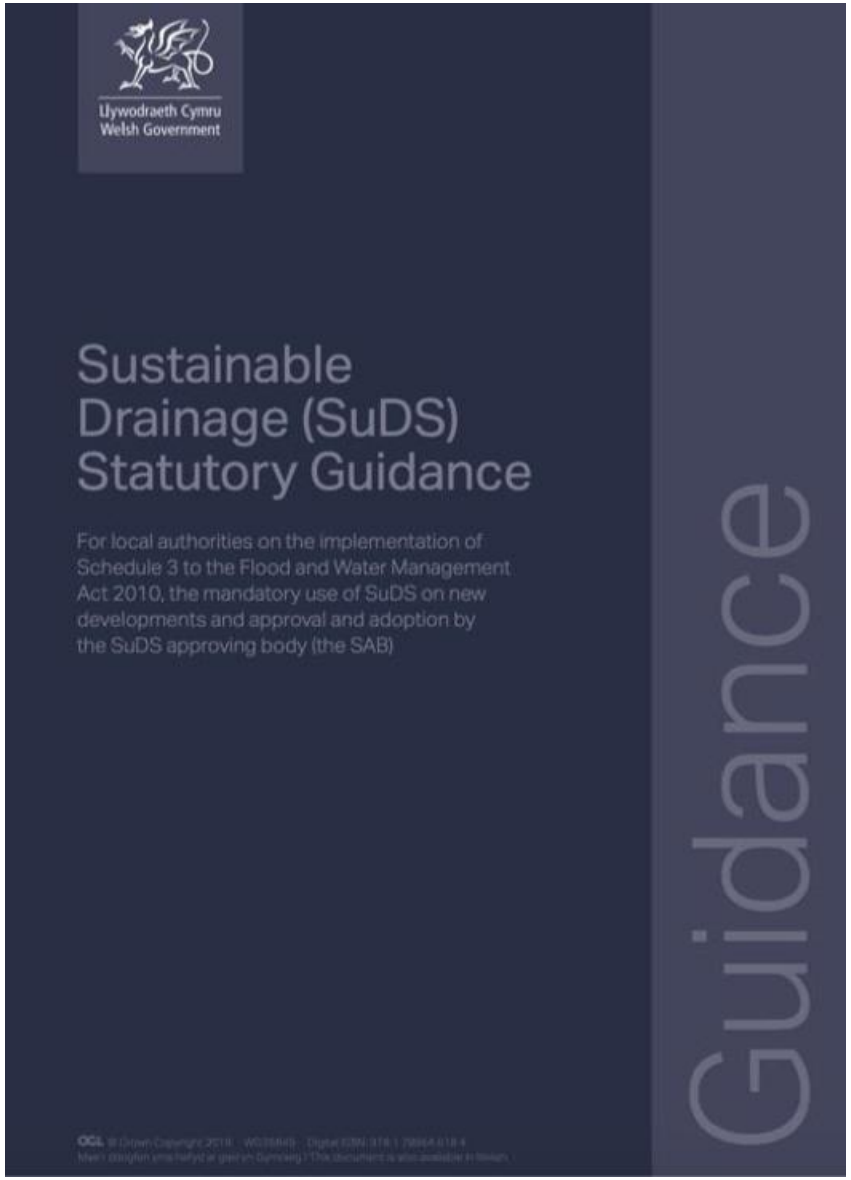
Challenges and Opportunities

Non-statutory technical standards for sustainable drainage systems

March 2015

Contents


Bully
Rex Features



The Welsh Way

"The statutory SuDS Standards contain a set of Principles, which must be applied in the design of any surface water drainage scheme, and six standards which in turn deal with:

S1 – Runoff Destination

S2 – Hydraulic Control

S3 – Water Quality

S4 – Amenity

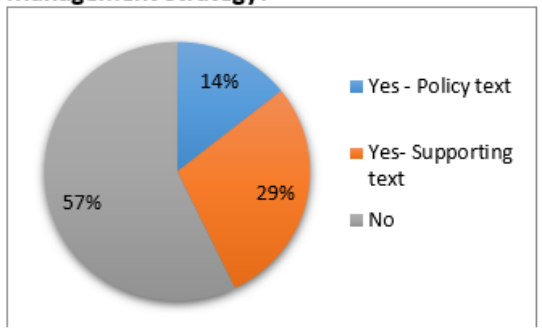
S5 – Biodiversity

S6- Construction, Operation and Maintenance."

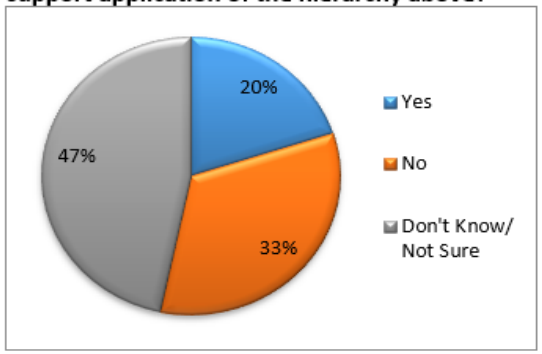
Challenges


Challenges
Drainage is an afterthought
Skill levels / training
Right information first time
Maximising opportunities
- Brownfield
- Surface storage
Strategic Sites
Variations in Local Plan approach
Maintenance
Resources
Conflicting advice

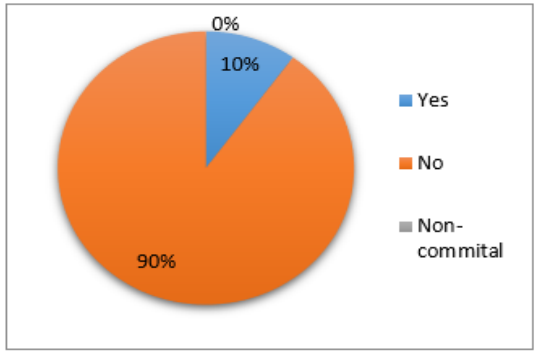
Does your Local Plan refer to your Local Lead Flood Authority's Local Flood Risk Management Strategy?



Does your Highway Authority allow connections from development to highway drains, to support application of the hierarchy above?



Does your Local Plan Policy clearly state preference for roof level and surface level SuDS components, which provide multiple benefits?



SuDS Questionnaire

Policies in Local Plans supported the four pillars of SuDS as follows:

- **Water QUANTITY** – 60% do, with 10% somewhat
- **Water QUALITY** – 39% do, with 14% somewhat
- **Amenity** – 34% do, with 18% somewhat
- **Biodiversity** – 39% do, with 14% somewhat

Only 20% of Highway Authorities allow development to connect to the highway drainage system despite it being included in the NPPG discharge hierarchy.

65% of Local Authorities do not adopt new Public Open Space.

Just 42% of LPAs apply a SuDS validation condition requiring the developer to prove the SuDS installed meet the agreed drainage design.

74% of LPAs use a planning condition to secure lifetime maintenance of SuDS, with the remaining 26% using a Section 106 Agreement.

80% of LPAs encourage the use of SuDS on minor developments, with 63% asking for the SuDS discharge hierarchy to be applied.

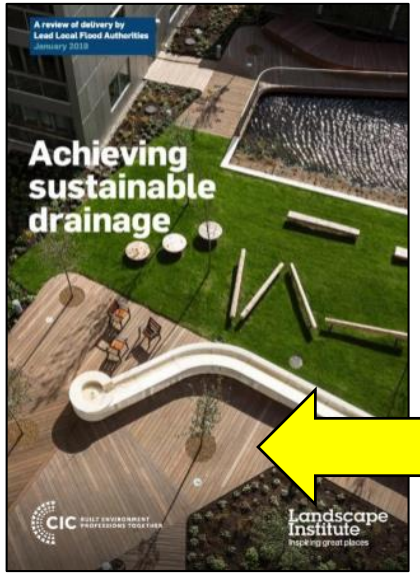
Findings: Recent Reports

MHCLG Review:

- Most LPAs have good SuDS policies, BUT only 1/3 of policies require adoption / maintenance in place for planning approval
- Developers have poor understanding of SuDS policies
- Makes no recommendations for improvement
- LPA resources insufficient

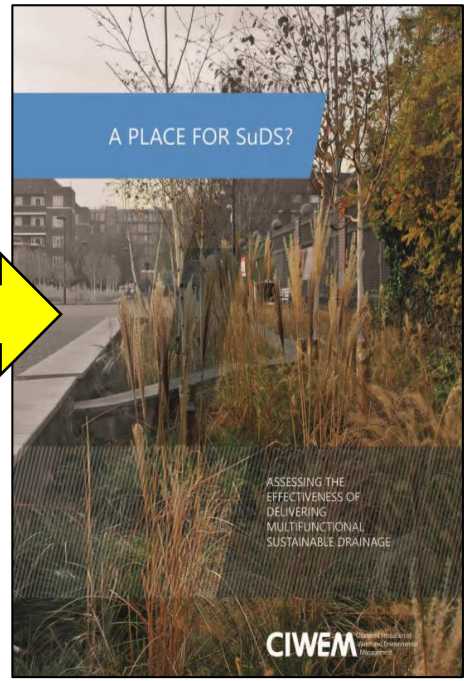
A Place for SuDS (CIWEM):

- 70% think current planning policy doesn't encourage SuDS enough
- Only 8% think current SuDS standards are driving high quality SuDS
- Site constraints being used to 'opt out'
- LPA resources insufficient
- Missed opportunities for wider benefits
- Adoption and maintenance is biggest barrier



Achieving Sustainable Drainage (Landscape Institute):

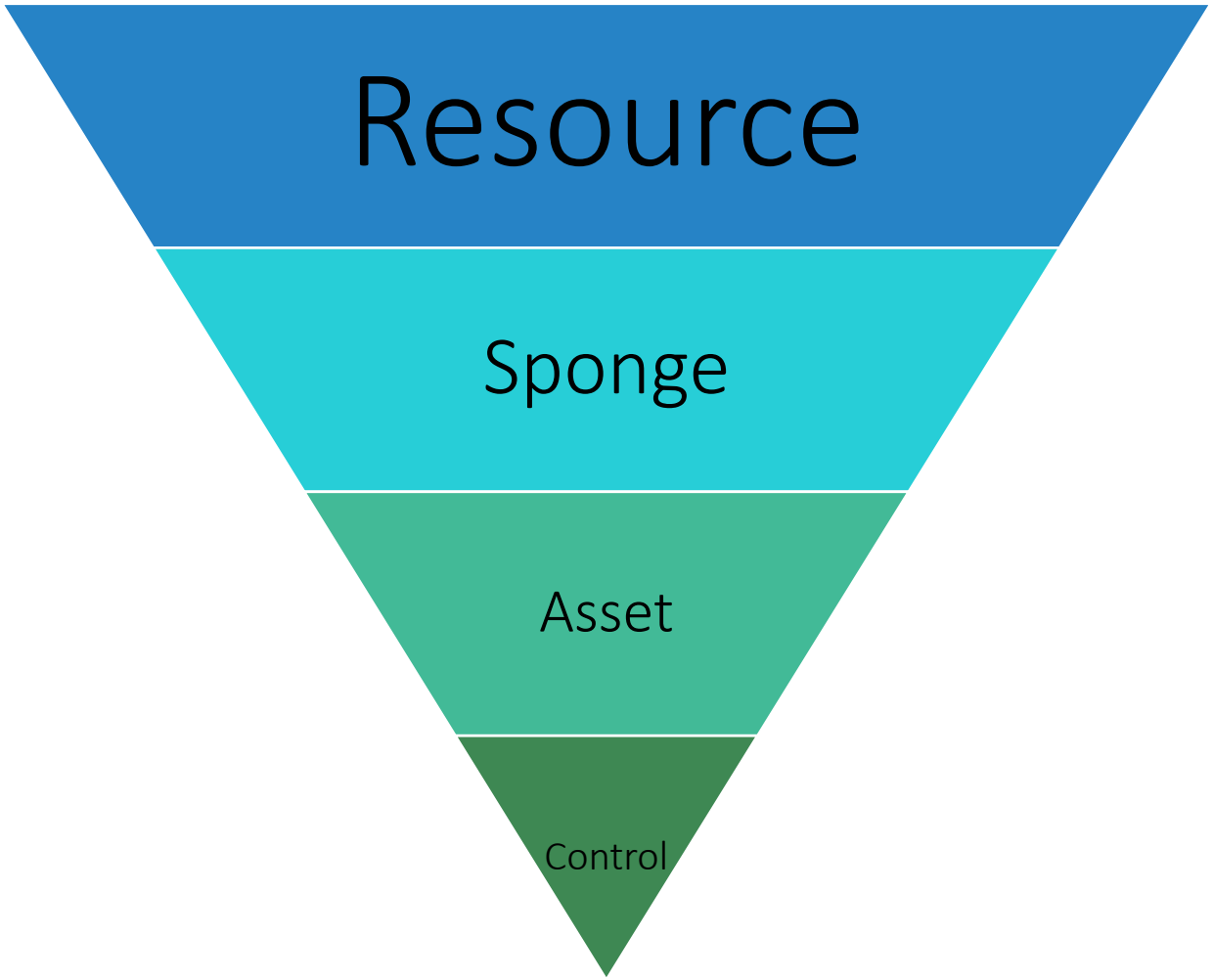
- Wide variability in SuDS policy
- LLFA constrained in ability to require multi-benefit SuDS *(Importance of Local Plan)*
- LLFA pre-app advice is important
- Quality of submissions inadequate or mixed
- Adoption – biggest challenge



Cultural and transformative change

Discharge: Obstacle → Opportunity

PPG Hierarchy of Drainage Options	
1.	into the ground (infiltration);
2.	to a surface water body;
3.	to a surface water sewer, highway drain, or another drainage system;
4.	to a combined sewer.



Reminder of the SuDS approach (land to be developed)

- Informed by site characteristics, tries to mimic the natural hydrology of the site.

- Use surface water as a resource
- Manage it close to where it falls
- Manage runoff on the surface
- Allow it to soak into the ground (infiltration)
- Promote evapotranspiration
- Slow and store runoff to mimic natural runoff
- Treatment of run off as required

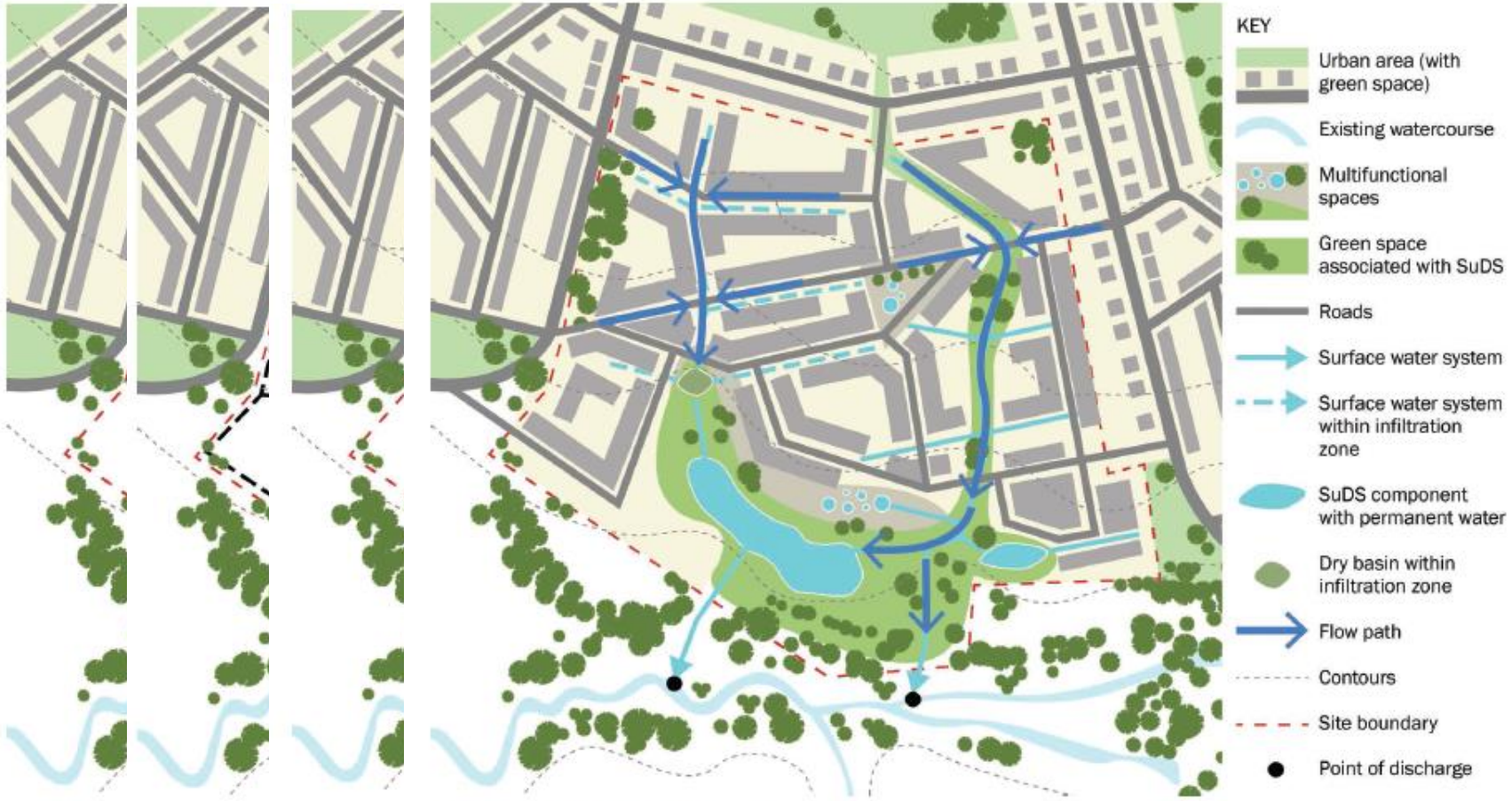


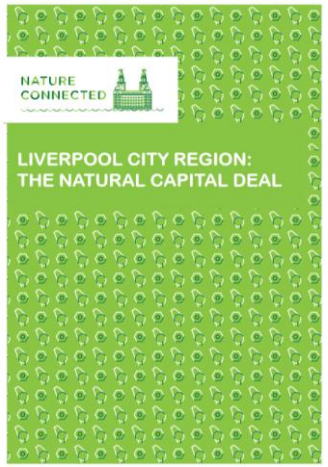
Figure 7.4 (Figure 7.6 D Figure 7.7 Figure 7.10 Defining exceedance routes

To maximise opportunities with SuDS, it needs early involvement to ensure the right design objectives are fully integrated into the process.

Moving from grey to green: Benefits of green SuDS

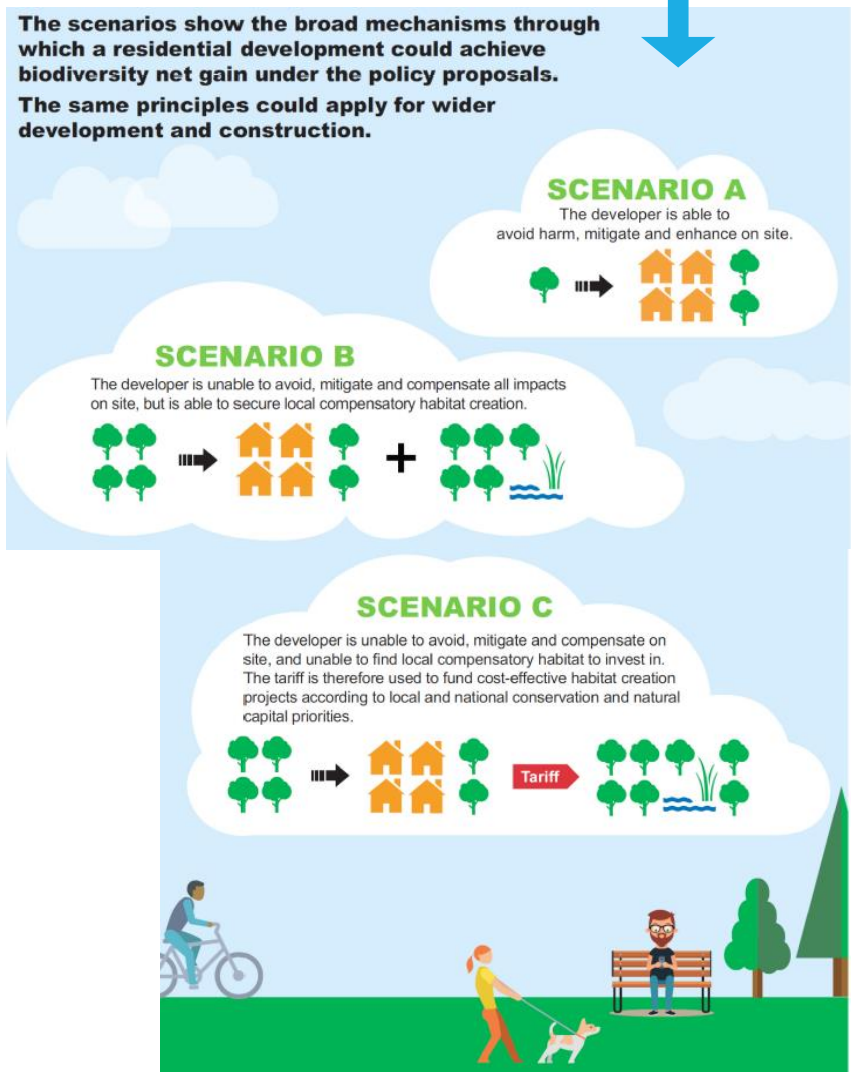
Considered from a developer's perspective

- Incentive through United Utilities **infrastructure discount (90%)** when dealing with surface water sustainably
- Address multiple needs through delivering SuDS
    1. Drainage (UU will accept the 100 year + climate change storage within inline surface SuDS for adoption)
    2. Green space (Public open space)
    3. Delivering Natural Capital
        - Biodiversity 'net gain' recent announcement this will be mandated



- Land that developers are looking at taking an option on now may be affected by biodiversity 'net gain' planning condition
- **SuDS can help developers deliver enhancement on site**

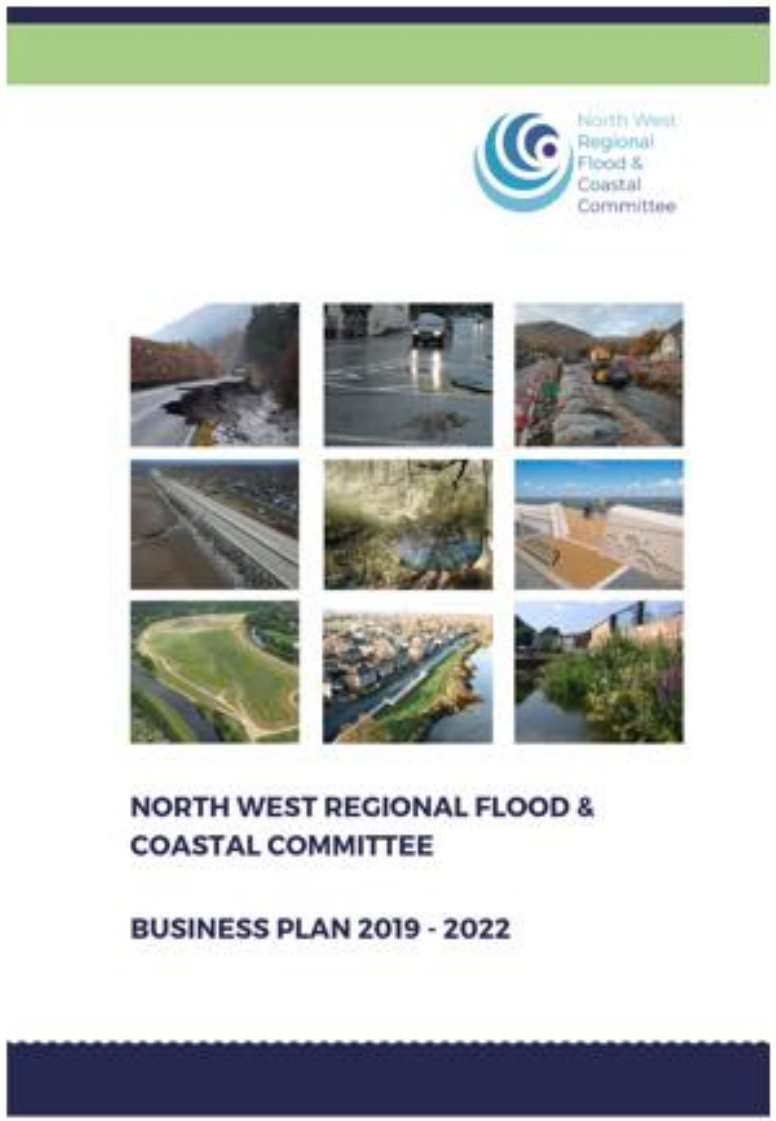
Taken from Greater Manchester Natural Capital Investment Plan (Jan 2019)

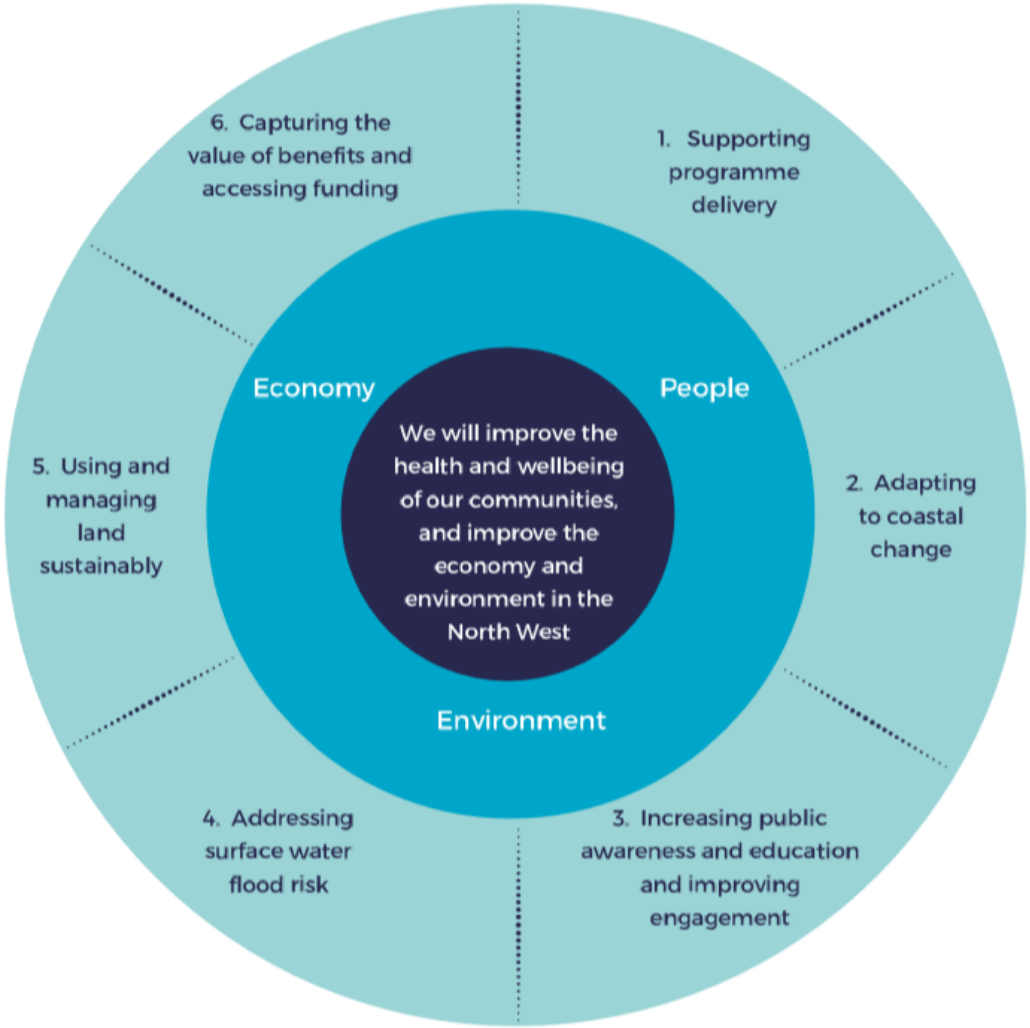


An ambitious North West

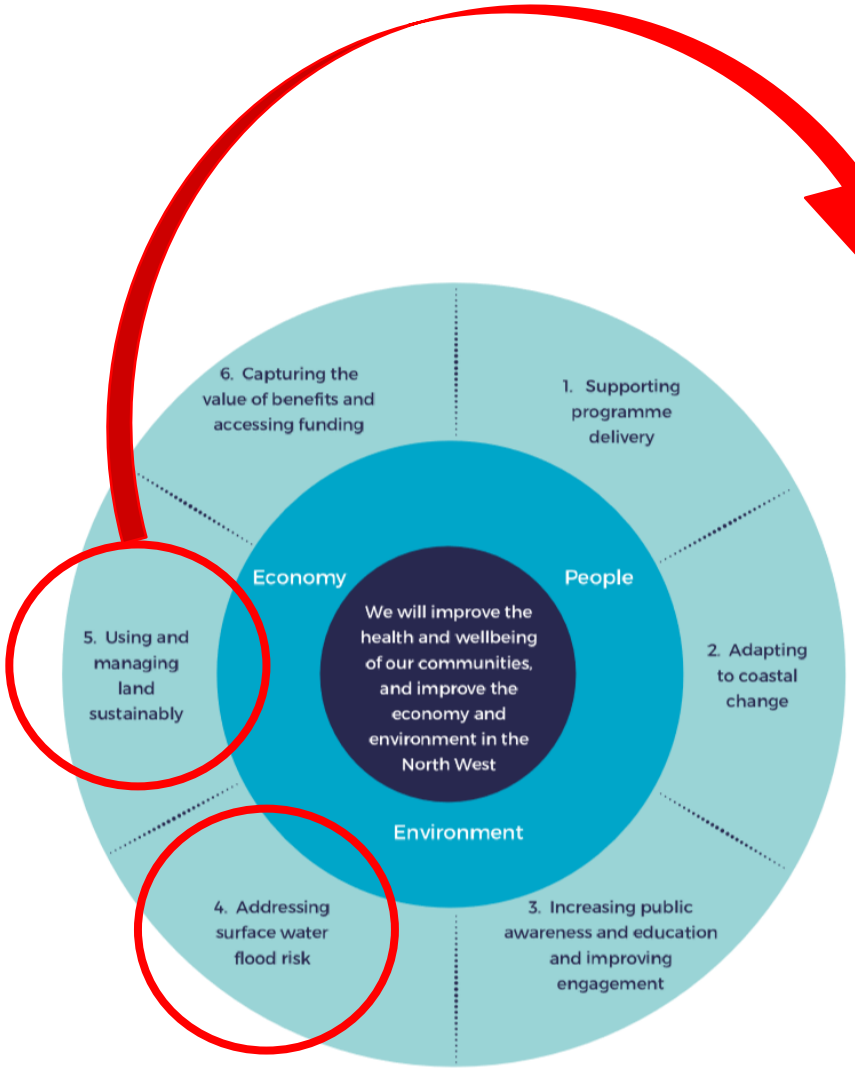
North West RFCC – Business Plan

THE FLOOD HUB





North West RFCC – Business Plan



As part of their role, risk management authorities seek to ensure new development is resilient and does not increase flood risk. They also seek to influence strategic plans and frameworks to take account of flood risk and coastal change in setting out what development is acceptable in specific locations.

The adoption of sustainable drainage systems (SuDS) by water companies from 2020 presents a real opportunity to reduce issues of future maintenance. The RFCC would like to see a consistent approach applied to SuDS requirements across the North West including strict adherence to the hierarchy for sustainable drainage. We are supporting partners (including Local Planning Authorities) to work together with United Utilities to prepare for and maximise the benefits of adoption through the planning process.

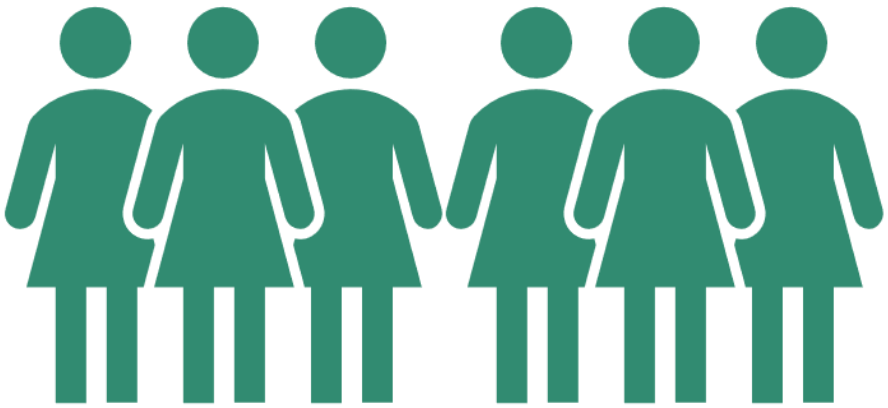
Key actions

1. Review what interventions (and resources) are needed to build on successes to date and fully embed **natural flood management** into risk management authority approaches.
2. Establish a Task and Finish Group for local authorities and the Environment Agency to work with United Utilities in ensuring planning (development management) processes are ready for **adoption of Sustainable Drainage Systems** from 2020.
3. Seek representation on the RFCC from a **specialist in development and planning** who can help to bring together the aims of risk management authorities with those of planners, transport planners and infrastructure providers.

Success measures

- Partners develop a common framework across the North West for SuDS requirements of new developments, for implementation within Local Planning Authority processes, allowing maximum adoption of SuDS by United Utilities from 2020.
- We secure a Development and Planning representative on the RFCC.
- We satisfy ourselves that the development of the environmental land management (ELM) payments scheme fully recognises and takes account of the needs and opportunities in relation to flood risk alleviation, as well as water quality.

North West SuDS Task Group



Local Planning Authority

Lead Local Flood Authority

Highway Authority

District Council Drainage Engineer

United Utilities

Environment Agency

Baseline

Pro-Forma

Development Life Cycle

Communication Plan

Training

Template Conditions

Template SPD

EXPERTISE WANTED!

Local Planning Authority

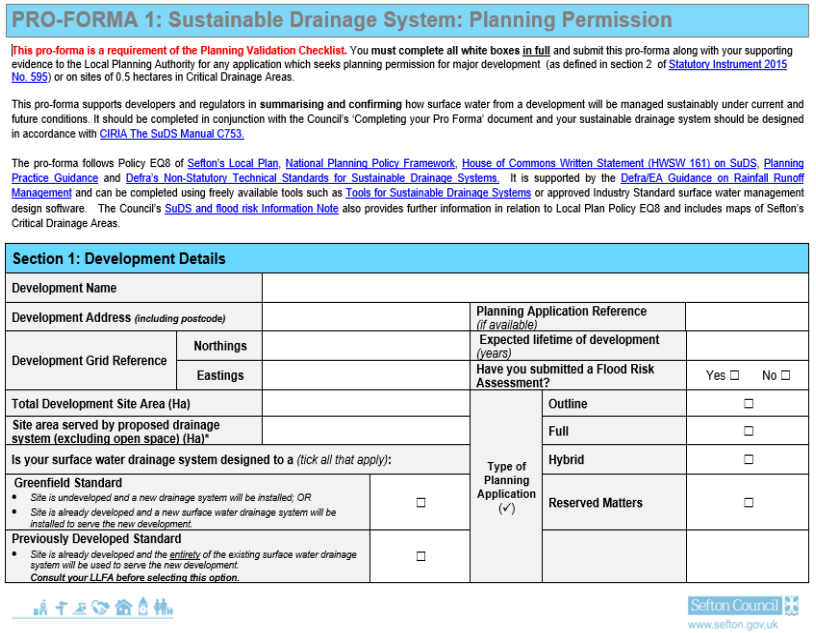
Highway Authority

GET INVOLVED

Tell your Partnership Coordinator

Sefton Pro-forma Approach

- Developed and trialled in 2018, implemented Spring 2019
- “Buy in” from Local Planning Authority = **CRITICAL**
- Supported by planning framework:
    - Local Plan and SuDS Information Note
    - Validation Checklist
- Two pro-formas with one guidance document:
    - Pro-forma 1: Planning Applications (major)
    - Pro-forma 2: Discharge of SuDS Conditions
- Using the pro-forma to support delivery of SuDS that meet the DCG



PRO-FORMA 1: Sustainable Drainage System: Planning Permission

This pro-forma is a requirement of the Planning Validation Checklist. You **must complete all white boxes in full** and submit this pro-forma along with your supporting evidence to the Local Planning Authority for any application which seeks planning permission for major development (as defined in section 2 of Statutory Instrument 2015 No. 595) or on sites of 0.5 hectares in Critical Drainage Areas.

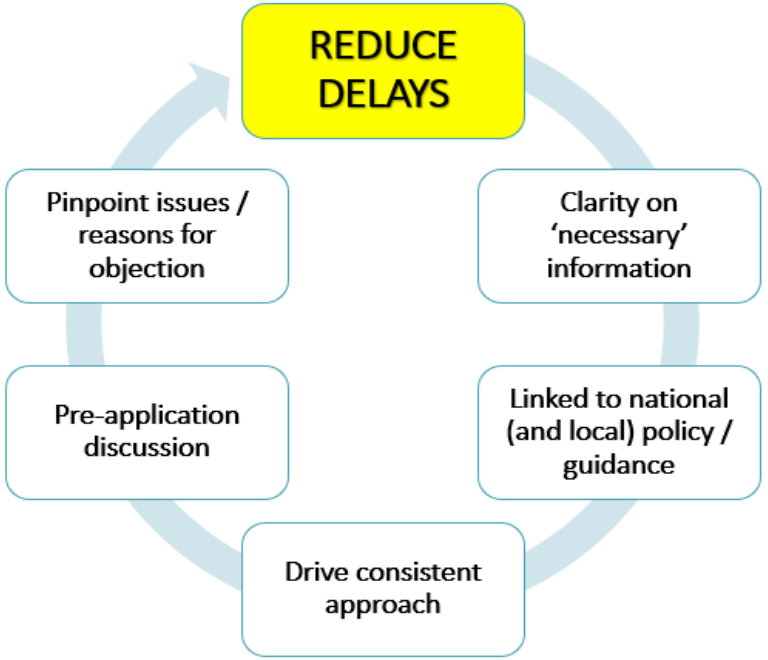
This pro-forma supports developers and regulators in **summarising and confirming** how surface water from a development will be managed sustainably under current and future conditions. It should be completed in conjunction with the Council's 'Completing your Pro Forma' document and your sustainable drainage system should be designed in accordance with CIRIA The SuDS Manual C753.

The pro-forma follows Policy EQ8 of Sefton's Local Plan, National Planning Policy Framework, House of Commons Written Statement (HWSW 161) on SuDS, Planning Practice Guidance and Defra's Non-Statutory Technical Standards for Sustainable Drainage Systems. It is supported by the Defra/EA Guidance on Rainfall Runoff Management and can be completed using freely available tools such as Tools for Sustainable Drainage Systems or approved Industry Standard surface water management design software. The Council's SuDS and flood risk Information Note also provides further information in relation to Local Plan Policy EQ8 and includes maps of Sefton's Critical Drainage Areas.

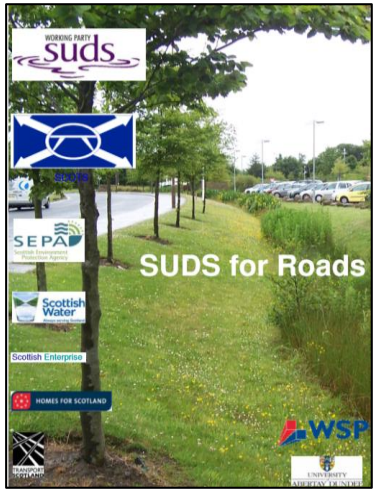
Section 1: Development Details

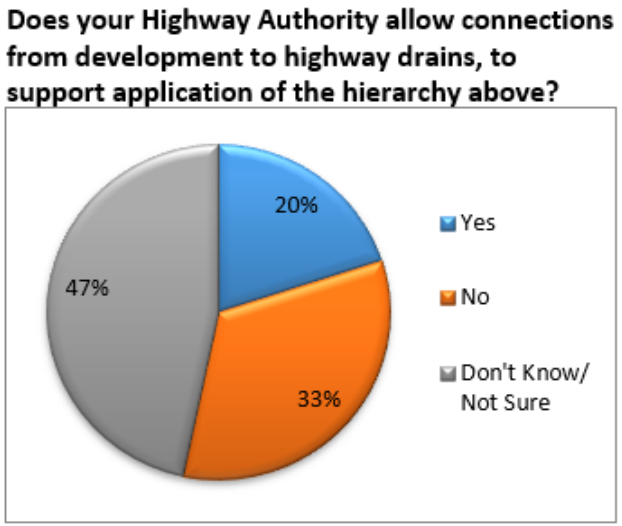
Development Name				
Development Address *(including postcode)*			**Planning Application Reference** *(if available)*	
Development Grid Reference	**Northings**		**Expected lifetime of development** *(years)*	
	Eastings		**Have you submitted a Flood Risk Assessment?**	Yes ☐ No ☐
Total Development Site Area (Ha)			**Type of Planning Application** (✓)	**Outline** ☐
Site area served by proposed drainage system (excluding open space) (Ha)*				**Full** ☐
Is your surface water drainage system designed to a *(tick all that apply)*:				**Hybrid** ☐
Greenfield Standard • *Site is undeveloped and a new drainage system will be installed; OR* • *Site is already developed and a new surface water drainage system will be installed to serve the new development.*	☐			**Reserved Matters** ☐
Previously Developed Standard • *Site is already developed and the entirety of the existing surface water drainage system will be used to serve the new development.* ***Consult your LLFA before selecting this option.***	☐			

Sefton Council
www.sefton.gov.uk



Highway SuDS





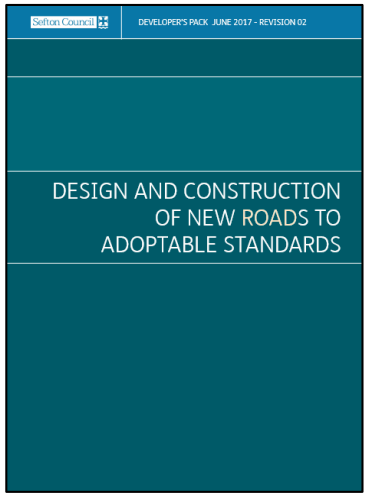
- Highway Design & Adoption Specification
- Scotland leading the way
- If sewers are unadoptable (S104), the Highway Authority are unable to adopt the highway (S38)
- Small changes = Big benefits
- Increased maintenance?
- Highways England?

A5758 Broom's Cross Road, Sefton

- New 2.8 mile single carriageway highway completed in 2015
- £20.4 million
- Whole Life Benefits £140-200 million

- 4 SuDS ponds and 4 wildlife ponds created
- 39,000 new trees and shrubs planted

- Multi- benefits – New/enriched habitat, walking routes, treatment train etc
- Council responsible for all maintenance aspects, including verges and SuDS ponds



Looking to the future…

What's on the horizon?

Increasing expectation that water is managed on a catchment scale and in an integrated way that delivers multi-benefits

- **25 Year Environment Plan** - Moves us towards natural capital and biodiversity net gain
- **New EA National FCERM Strategy –** expected in late 2019/2020
- **New Local FRM Strategies by LLFA (expected 2020 >)** – Vision for SuDS in your area?
- **Drainage and Wastewater Management Plans (DWMP)** – Required from 2025
- **United Utilities AMP 7 (2020 – 2025)** – Business plan period supports integrated catchment management techniques and embedding SuDS as part of this approach
- **Combined Authorities –** Is SuDS / water management a strategic matter for Metro Mayors?
- **North West Regional Flood and Coastal Committee (RFCC)** – Supporting how we can improve the uptake and quality of SuDS, including their adoption, through a north west approach

Association of SuDS Authorities Conference

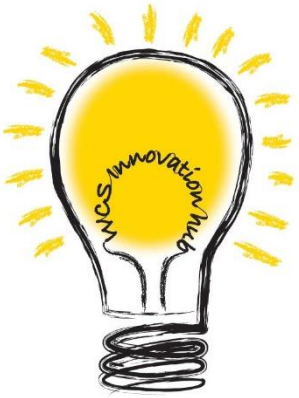
When:	29th October 2019, 9.30am – 5pm
Where:	Hertfordshire Development Centre, Stevenage
What:	• Presentations from keynote speakers • Opportunity to discuss SuDS and the future of our industry • ASA wants to help get consistency throughout our industry – how can the North West play a role in this? • Small market space area - product suppliers and new innovations • Networking and sharing of best practice
Cost:	Members: Free Non-Members: Cost varies (see website)
Details:	https://www.suds-authority.org.uk/events/

INNOVATION

DISCOVERY

Enabling Development

Managing Risks



GROWTH

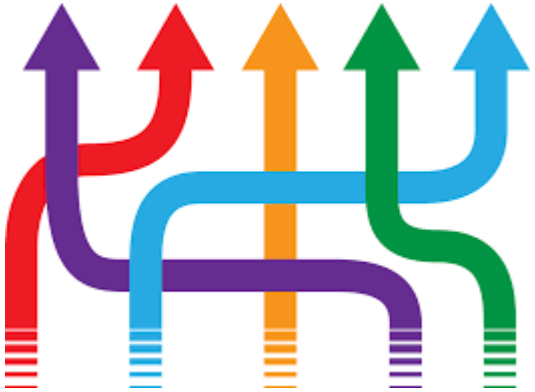
FLEXIBILITY

DYNAMIC

VISION

Working Better Together

Great Spaces and Places



INCLUSION

PARTNERSHIP

Thank you

Questions for the Presenters

United Utilities
helping life flow smoothly

Time for lunch...

United Utilities
helping life flow smoothly

Use of SuDS Opportunity Mapping – Manchester City Council

Managing flood risk from new development in partnership

26th September 2019

Zorica Todorovic

United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

Manchester City Council SuDS Policy

- LLFA since 2012
- National Standards for SuDS
- Drainage hierarchy
- Brownfield sites betterment
- Green solutions

- **Policy EN 4: Reducing CO2 Emissions by Enabling Low and Zero Carbon Development**
- **Policy EN 8L Adaptation to Climate Change**
- **Policy EN 9: Green Infrastructure**
- **Policy 14: Flood Risk**
- **Policy 15-17: Biodiversity, Air Quality, Water Quality**

United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

Climate Change Challenges

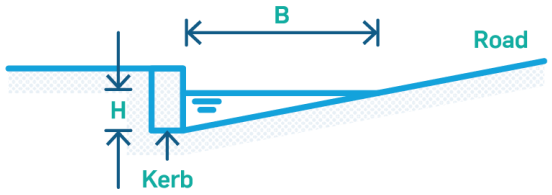
Standard of protection increases

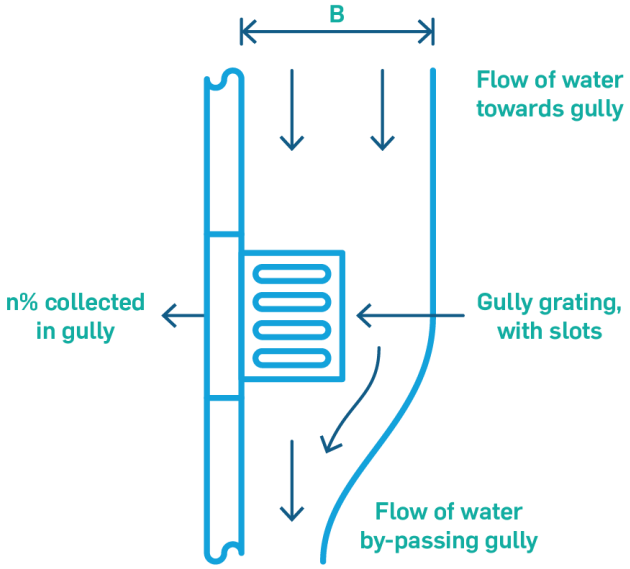
2, 5, 30 year storms

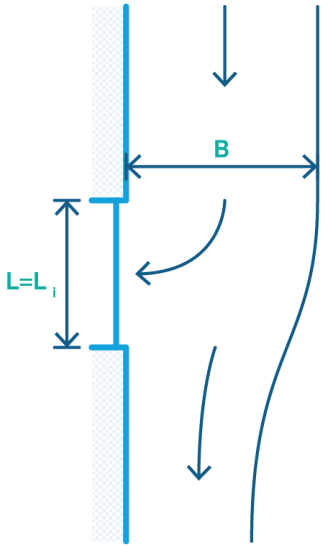
100 year storms - allowance for climate change 40%

Large attenuation tanks - flash floods

How to manage flows?

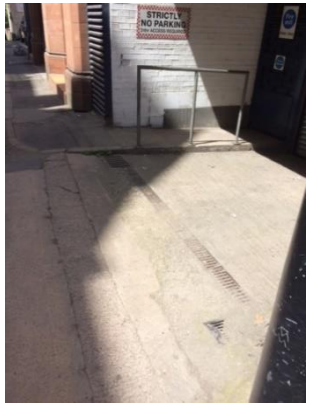




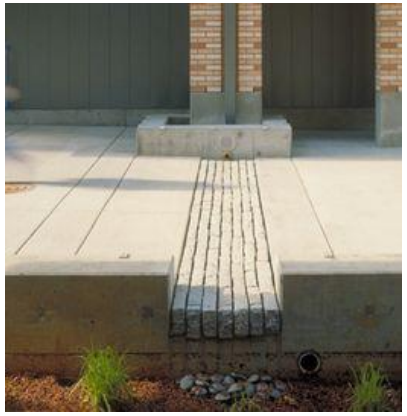


Managing Water on Surface

Typical inlets in cities



Could it be different – easier to maintain maybe more green



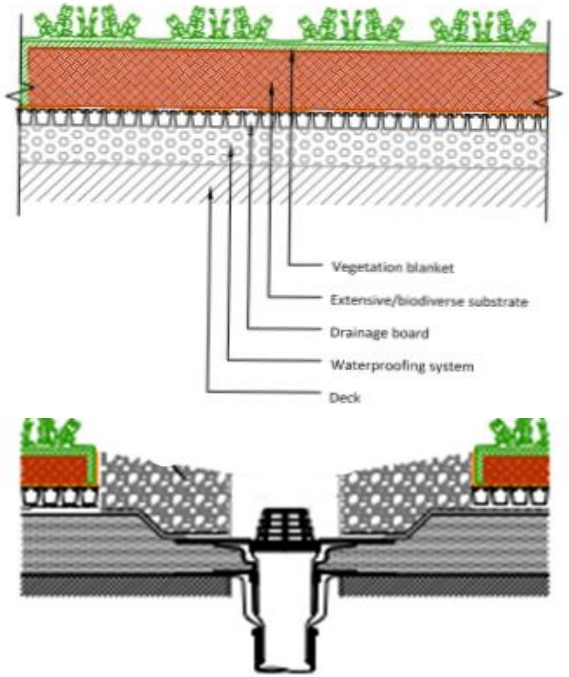
High Density – Blue Green Roofs

Manchester, Princess Street

Manchester, Circle Square

Apartment Block, Upper Chorlton Road

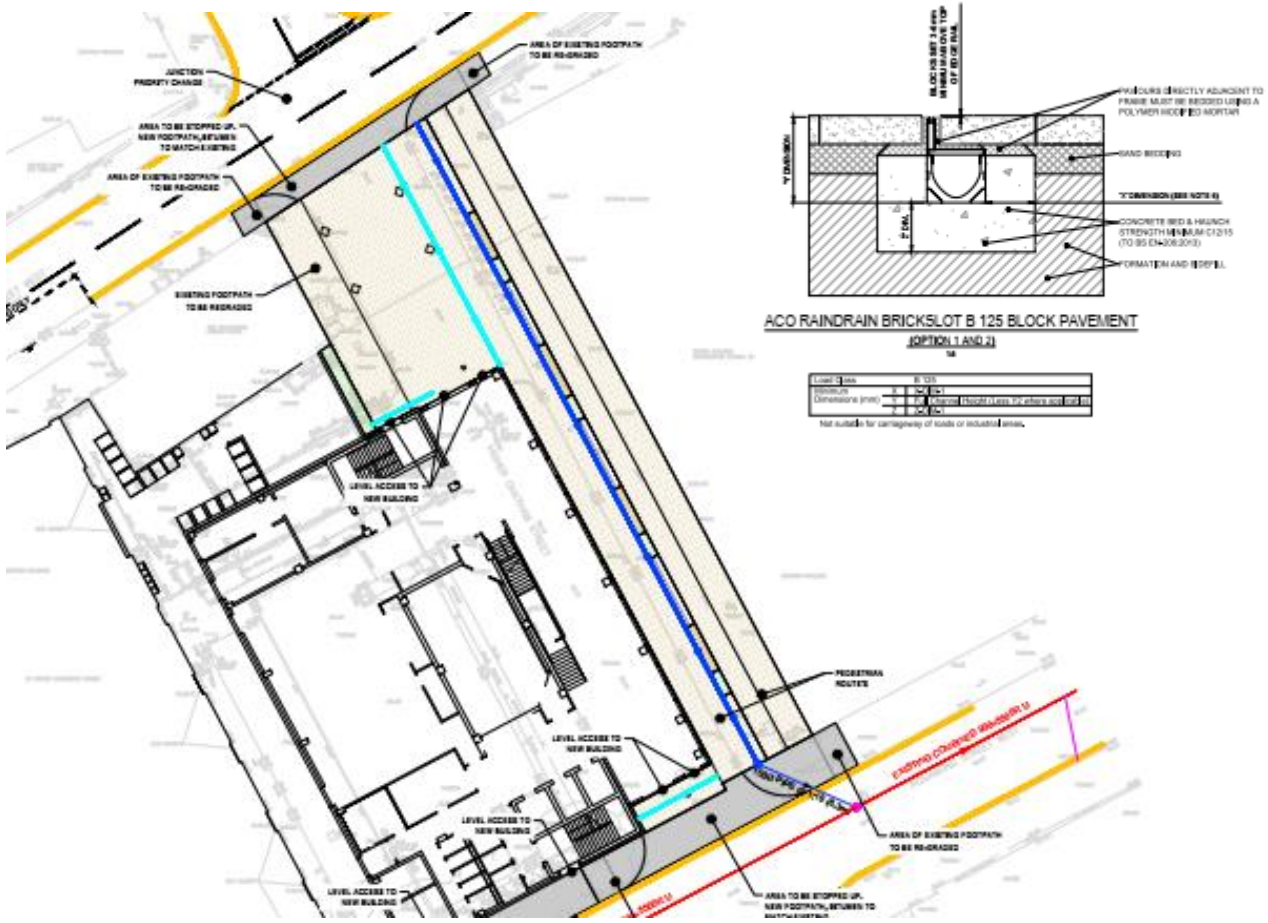
Mixed Use Development, Oldham Road…

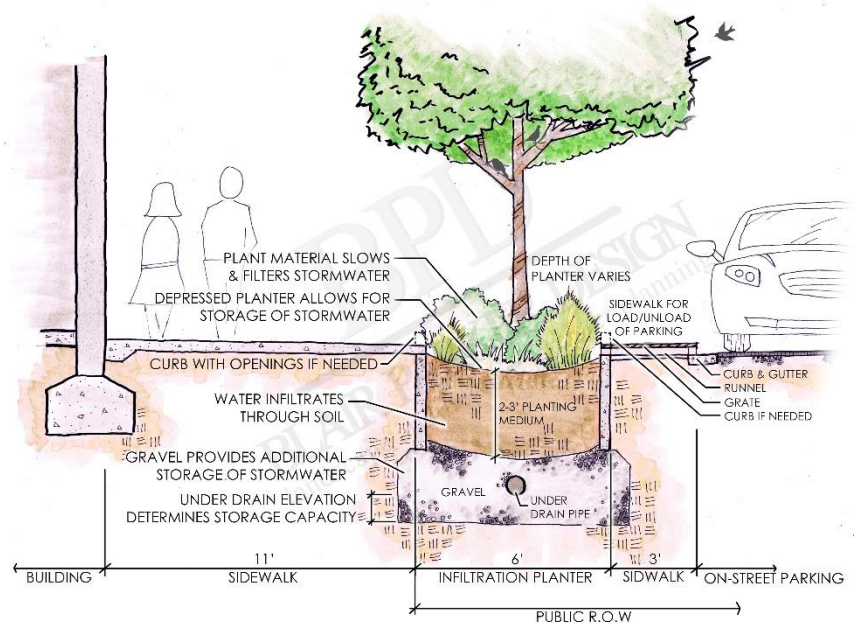


United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

Highways – Bioretention and Tree Pits





United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

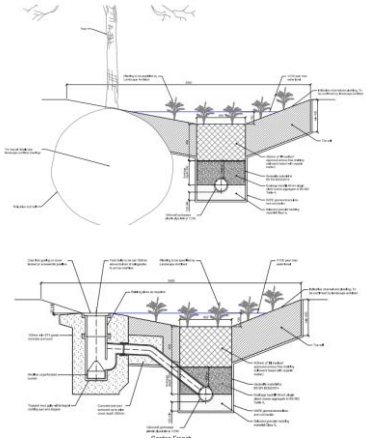
Public Realm – Raingardens and Tree Pits

Circle Square, Manchester

Old St Mary's Hospital, Manchester

Hardman Court, Manchester

Manholes
Catchpit Chambers
Pipes
Drainage Channels
Gullies
Filter Drains
Attenuation Tank
Flow Control Unit
Smart Filter
Green Roof Area



United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

SuDS Opportunity Mapping

United Utilities
helping life flow smoothly

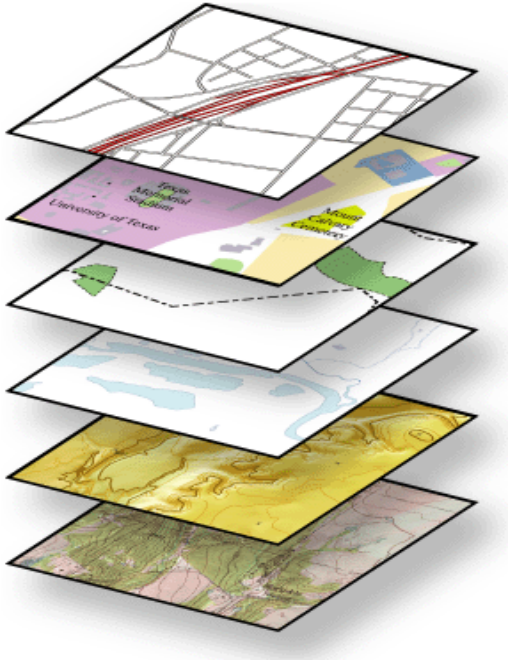
MANCHESTER CITY COUNCIL

ATKINS
Member of the SNC-Lavalin Group

SuDS Opportunity Mapping

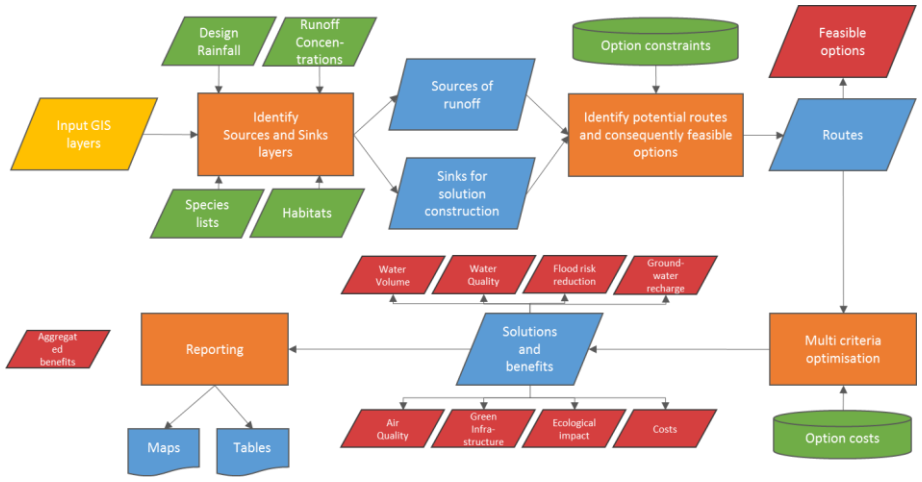
Input Layers

- MasterMap
- LiDAR
- BGS Infiltration Maps
- Detailed River Network
- Surface Water Flood Maps
- Flood Zones
- Listed buildings
- Drainage network
- Source Protection Zones
- Priority habitats
- Clean water mains pipes
- Development Zones
- What else is available?



Parameters

- Distances
- Sizes
- Rainfall
- Maintenance lifetime
- Ground slope
- CAPEX, OPEX, Benefits



United Utilities helping life flow smoothly

MANCHESTER CITY COUNCIL

ATKINS Member of the SNC-Lavalin Group

Outputs - Site Information

MasterMap FID	117906
Feature Type	Natural Space
Area (m2)	499.086
Optimisation status	(s)
Width	
Is flat?	
Elevation (mAOD)	29.958
Height (m)	
Gradient	0.09141
Listed building grade	
BGS infiltration score	
Road type	
Road name	
Road number	
Traffic calming?	
uFMfSW return period	100
Tags	
Distance to Detailed River Network	
Distance to Flood Zone 3	
AREANAME	Whitlingham Trowse
CSO_ASSE01	
GDB_REFERE	
ASSET_TYPE	
Number of routes	10
List of feasible solutions (code)	Bi_B_N_P, Bi_M_N_P, Bi_R_N_P,...
List of feasible solutions (abbreviated)	Bi, DD, FD, RA, Sw
List of feasible solutions (full)	Bioretention, Disconnect Down...
Optimisation subgraph	-3143
Number of options selected	3
List of options selected (code)	Bi_M_N_P,Sw_M_P,Sw_R_NS_P
Dominant option (code)	Sw_R_NS_P
List of options selected (abbreviated)	Bi, Sw
Dominant option (abbreviated)	Sw
List of options selected (full)	Bioretention, Swales
Dominant option (full)	Swales
TOTEX (all options)	3086.58
CAPEX (£, all options)	860.13
OPEX (£, all options)	2226.45
TOTEX (dominant option)	1501.87
CAPEX (£, dominant option)	472.18
OPEX (£, dominant option)	1029.69
Volume removed (m3, all options)	21.497
Volume removed (m3, dominant opti...	15.739

- Air Quality
- Sequestered Carbon
- Improved parks
- Green Street Value
- Flood risk benefit
- Groundwater value
- Carbon levy (pumping + WRC)
- WRC energy
- Pumping Energy

uFMfSW	100.000000000000000
sol_area	1.533000000000000
num_detac	57.333333333333371
num_flats	0.000000000000000
num_other	1636.147619047591434
Trees	0
Shrubs	0
Flowers	0
Grasses	58
Aquatic	14
Other	0
C_Em_t	3.37260000
C_Seq_t	0.02023560
Build_kWh	0.00000
Build_C_t	0.00000
Dev_area	851.660
det_pop	130
flats_pop	0
other_pop	3725
NO2_t_yr	0.00000000
SO2_t_yr	0.00000000
PM10_t_yr	0.00000000
O3_t_yr	0.00000000
NO2_t_tot	0.00000000
SO2_t_tot	0.00000000
PM10_t_tot	0.00000000
O3_t_tot	0.00000000
C_Em	3.373
Build	0
Build_Av	0
C_Seq	58
Air	0
Gr_Sp	1840198
Ext_Tot	1840256
Final_Tot	1840256

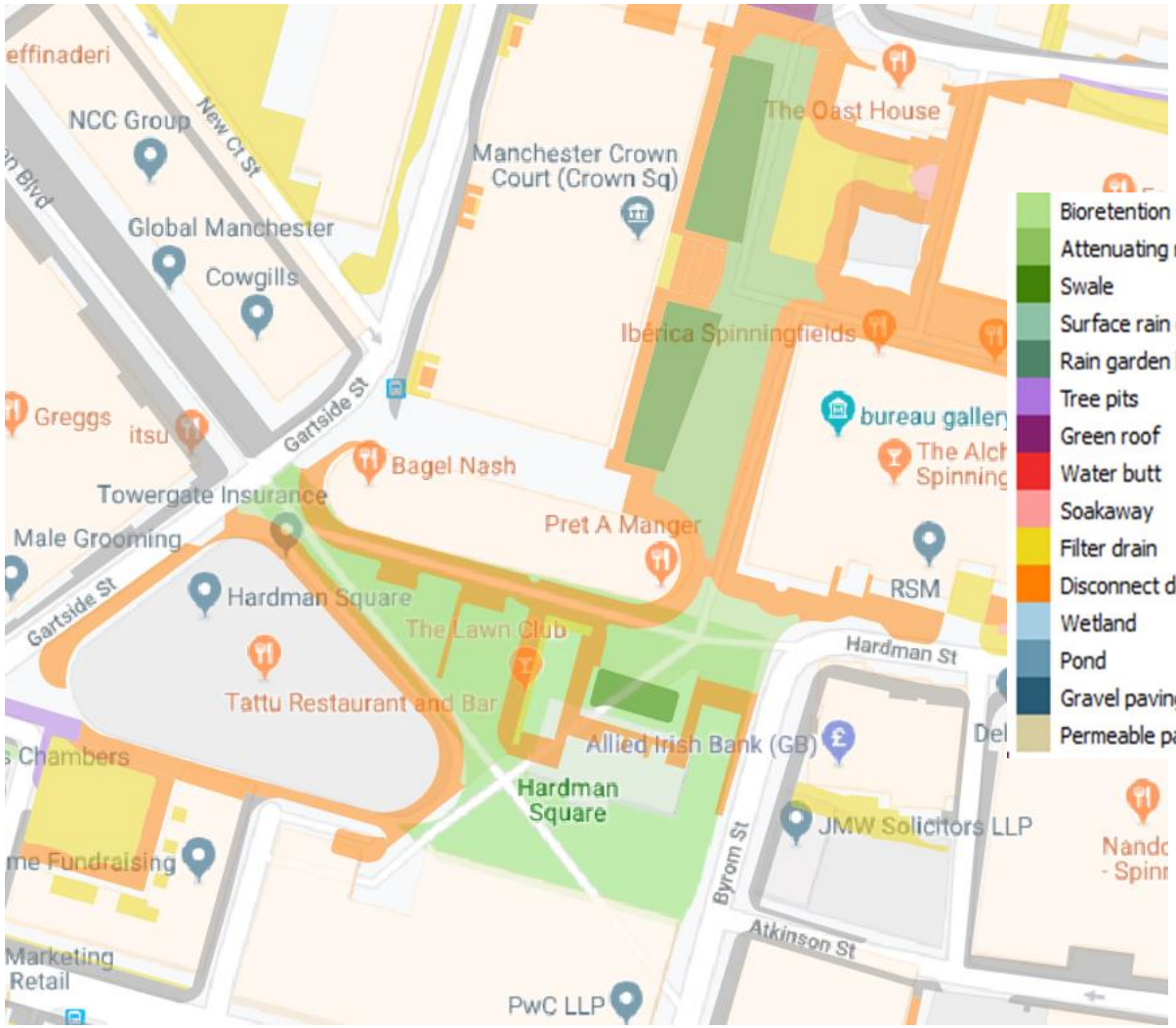
PerRemAll	71.2
PerRemDom	71.2
House_Type	
Po_We_450m	False
Po_We_num	0
gr_str_25m	False
GS_num_int	0.000000000000000
pump_st	
WBs	0
WB_red_con	0.00
InfSAARm3	0.00
Elim_vol	0.00
Pump_m3	0.00
Pump_kWh	0.00000
Pump_C_t	0.00000000
WWTW_kWh	0.00000
WWTW_C_t	0.00000000
Crp_m2	228.260
Crp_%	0.000
Res_Cr_m2	144165.000
Res_Cr_%	0.000
Con_Vol_m3	0.00
Con_C_t	0.00000000
Con_C_kWh	0.00000
GS_resi	0.00
Pump	0.00000
WWTW	0.00000
Avoid	0.00
C_Av_C	0.00
C_Av_W	0.00
C_Av_E	0.00
Inf	0.00
Gr_Str	0.00
C_Ben_t	0.00000000
CC_levy	0.00
Int_Tot	0
Ext_Tot	0
Final_Tot	0

United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

ATKINS
Member of the SNC-Lavalin Group

Use of Data – Planning



United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

ATKINS
Member of the SNC-Lavalin Group

Use of Data – Lost Opportunities – Retrofit?

United Utilities
helping life flow smoothly

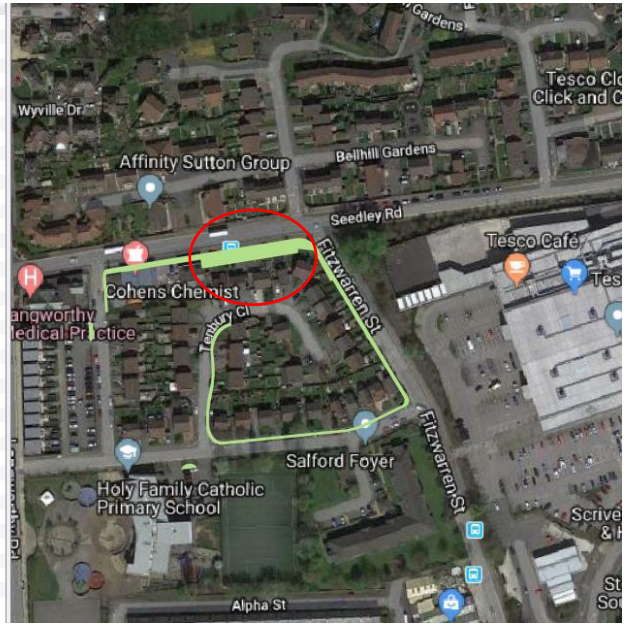
MANCHESTER CITY COUNCIL

ATKINS
Member of the SNC-Lavalin Group

Use of Data – Bioretention and Tree Pits

Over 2100 opportunities to locate bioretention in pavements across Manchester

MasterMap FID	54,874
(Derived)	
(Actions)	
MasterMap FID	54,874
Feature Type	Pavement
Area (m2)	1,192.593
Optimisation status	s
Width	2.1
Is flat?	
Elevation (mAOD)	46.917
Height (m)	
Gradient	
Listed building grade	
BGS infiltration score	Infiltration likely
Road type	
Road name	
Road number	
Traffic calming?	
uFMfSW return period	100
Distance to Detailed River Network	
Distance to Flood Zone 3	
Number of routes	53
List of feasible solutions (code)	Bi_Pa_Pa_P, Bi_R_Pa_P, PP_Pa_U_P, RS_B_Pa_P, TP_R_Pa_P
List of feasible solutions (abbreviated)	Bi, PP, RS, TP
List of feasible solutions (full)	Bioretention, Permeable Block Paving, Rain Gardens (Surface), Tree pit
Optimisation subgraph	4,226
Number of options selected	1
List of options selected (code)	Bi_Pa_Pa_P
Dominant option (code)	Bi_Pa_Pa_P
List of options selected (abbreviated)	Bi
Dominant option (abbreviated)	Bi
List of options selected (full)	Bioretention
Dominant option (full)	Bioretention
TOTEX (all options)	21,779.19
CAPEX (£, all options)	20,453.04
OPEX (£, all options)	1,326.15
TOTEX (dominant option)	21,779.19
CAPEX (£, dominant option)	20,453.04
OPEX (£, dominant option)	1,326.15
Volume removed (m3, all options)	1.024
Volume removed (m3, dominant option)	1.024



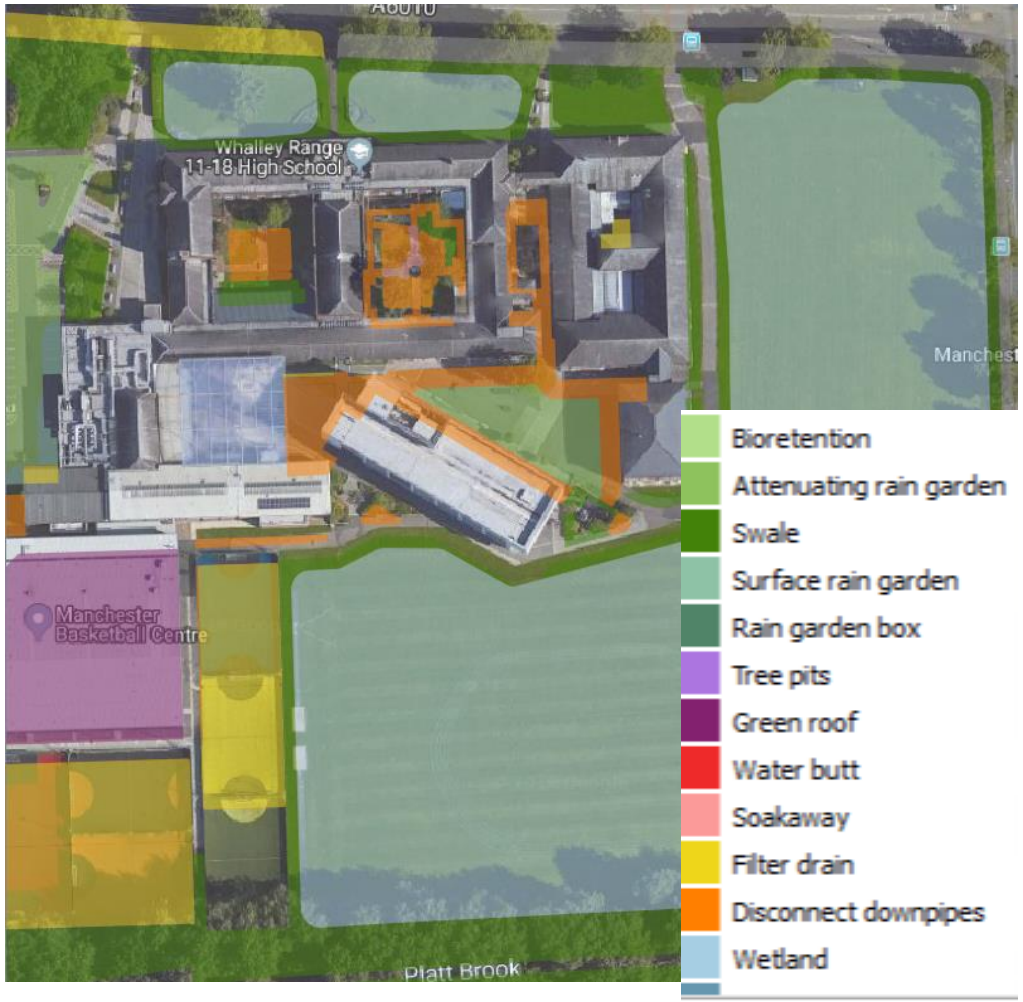
United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

ATKINS
Member of the SNC-Lavalin Group

Use of Data - School

Key metrics	
Total area (m2)	20,128
Volume produced (m3)	634
Dominant opportunities	Attenuating rain gardens, Disconnection of downpipes Filter Drains, Soakaways Swales
Volume addressed by all opportunities (m3)	625
CAPEX (£)	156,190
OPEX (£)	30,501
TOTEX (£)	186,691
% removed	99%



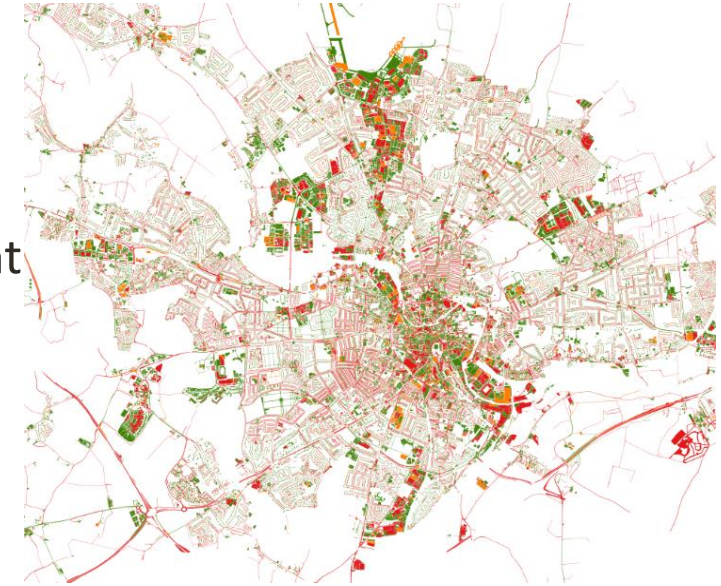
United Utilities
helping life flow smoothly

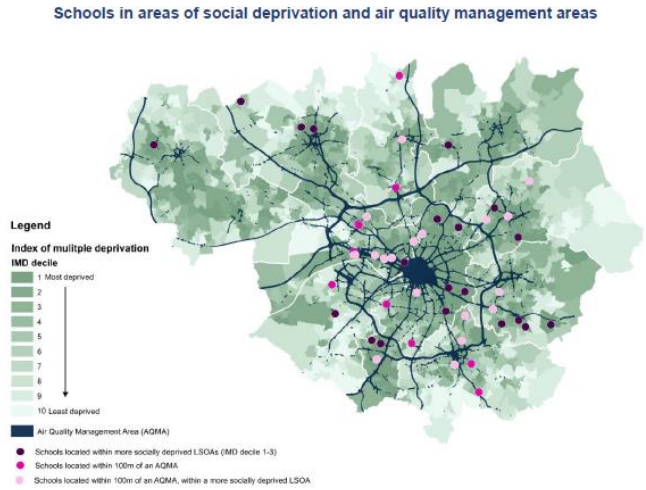
MANCHESTER CITY COUNCIL

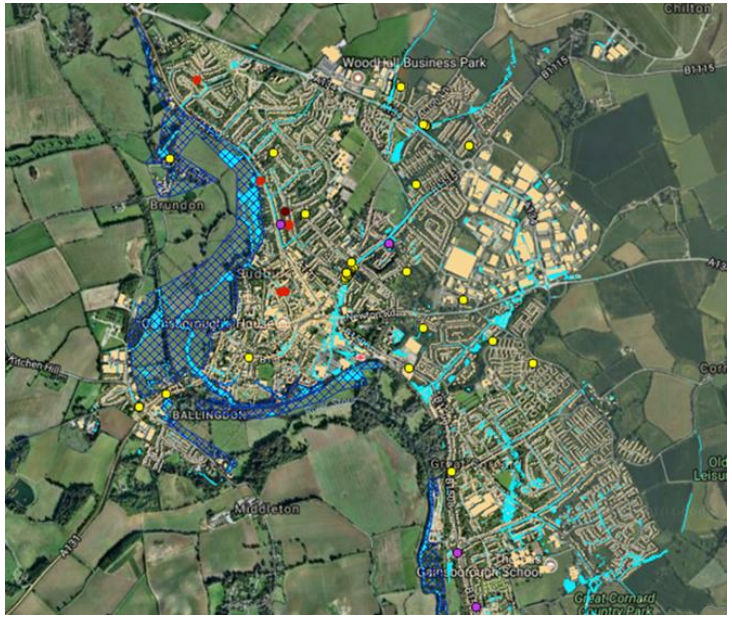
ATKINS
Member of the SNC-Lavalin Group

Wider Use of Data

- Making the most of planned development and retrofit options
- Prioritising locations for schemes e.g. focus on Schools, roads, etc.
- Feeding into Strategic planning
- Addressing multiple needs / challenges
- Enabling better working together
  - Facilitating internal and external collaboration
  - Flood risk management
  - Improving air quality
  - Educational benefits







United Utilities
helping life flow smoothly

MANCHESTER CITY COUNCIL

ATKINS
Member of the SNC-Lavalin Group

Breakout Session

United Utilities
helping life flow smoothly

Question 1

What are the blockers to a development site being drained in the most sustainable way?

Question 2

Building on any successful approaches or good practice and thinking innovatively, what could be done to ensure a site is drained in the most sustainable way?

United Utilities
helping life flow smoothly

Question 3

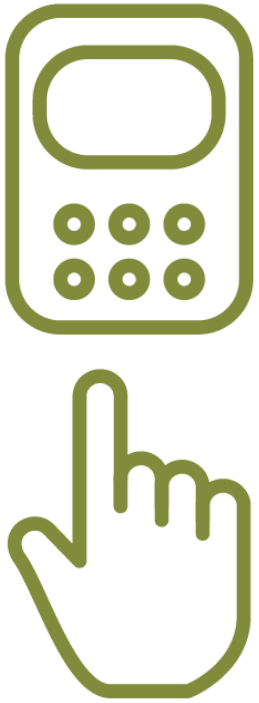
What ideas do you have for us as the flood family to work better together with regard to new development and flood risk?

Reflections from the Day

Tony Griffiths and Sophie Tucker

United Utilities
helping life flow smoothly

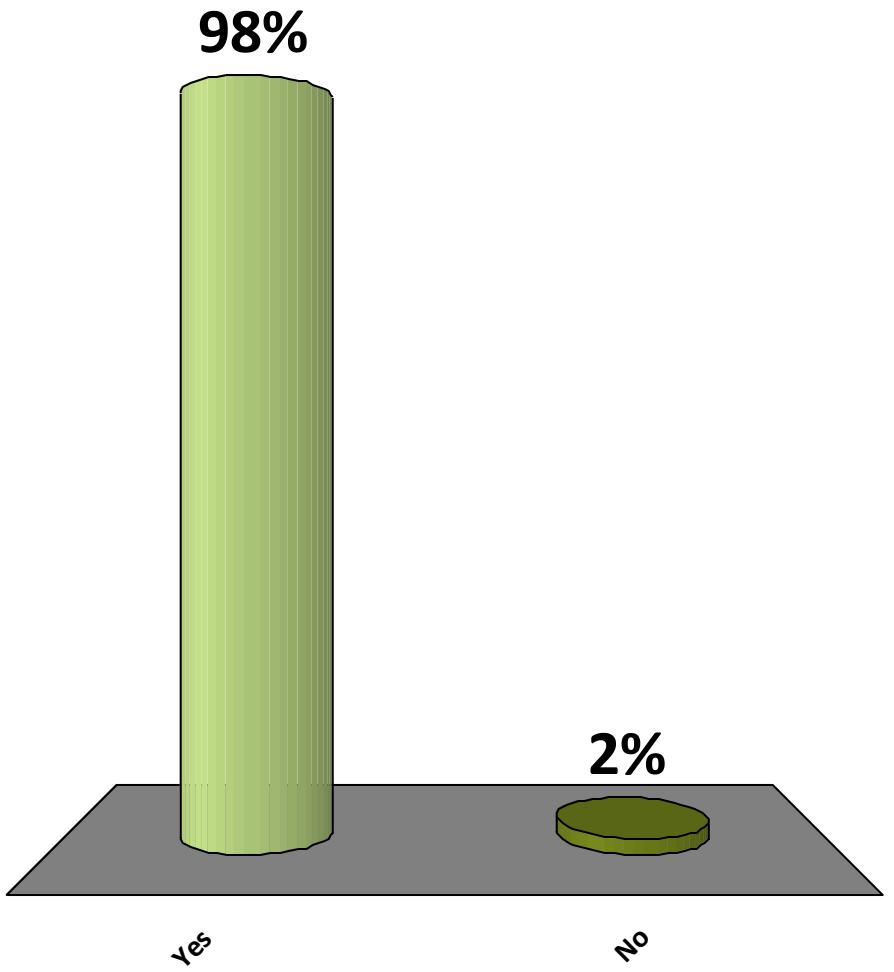
Time to vote...



- Press **GO, 4, 1, GO** to turn your key pad on
- It will flash red/green
- A question will appear on screen
- Select the letter of your preferred response
- Press the keypad – the green light will flash to record your vote
- You can vote twice and it will always take your last response

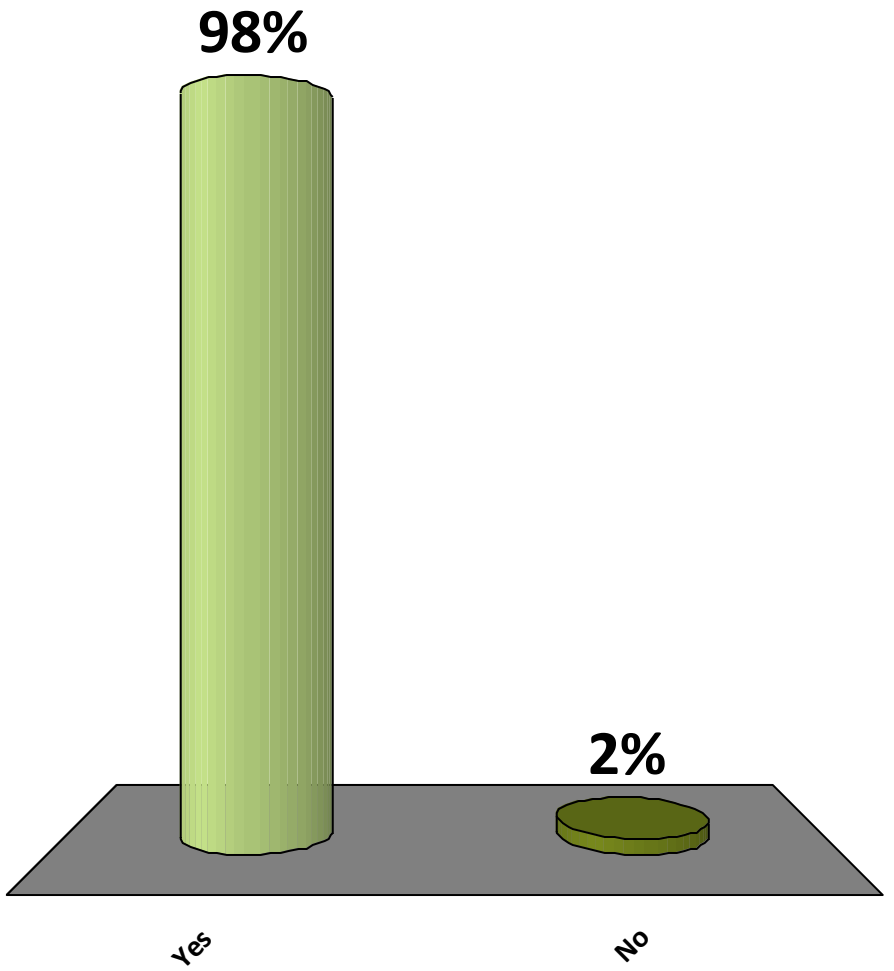
Have you enjoyed the day?

A. Yes
B. No



Have you learnt something new?

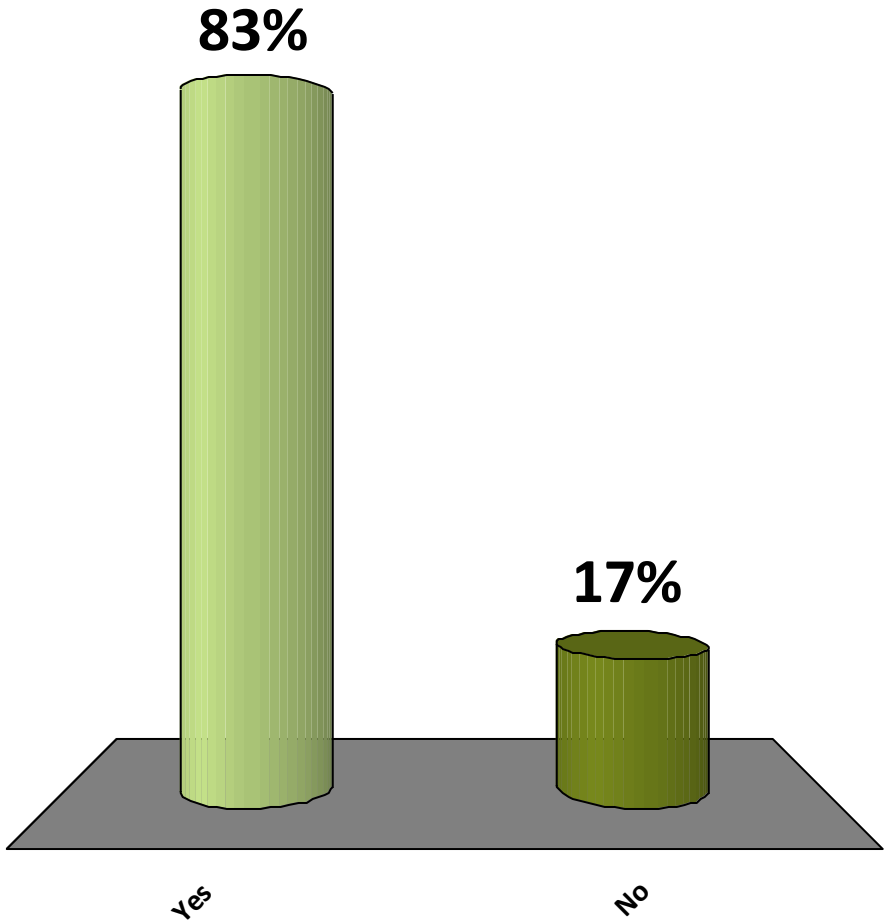
A. Yes
B. No



Have you been able to put a face to a name today?

A. Yes

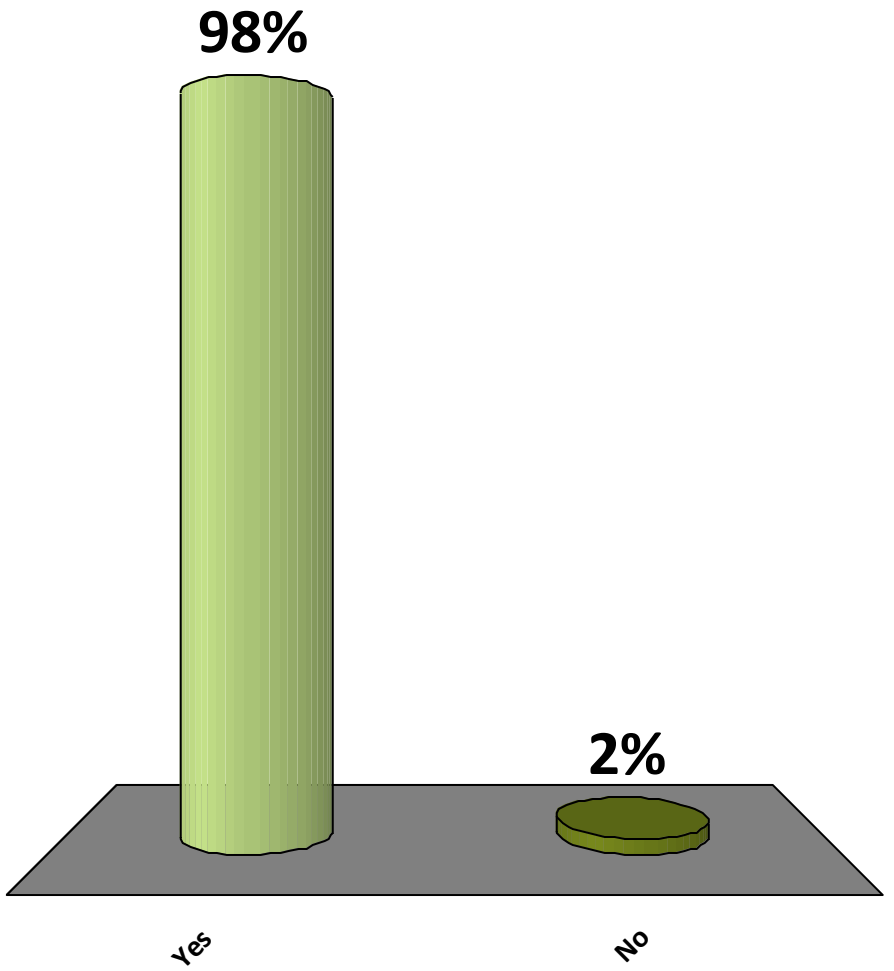
B. No



Would you attend a similar event in the future?

A. Yes

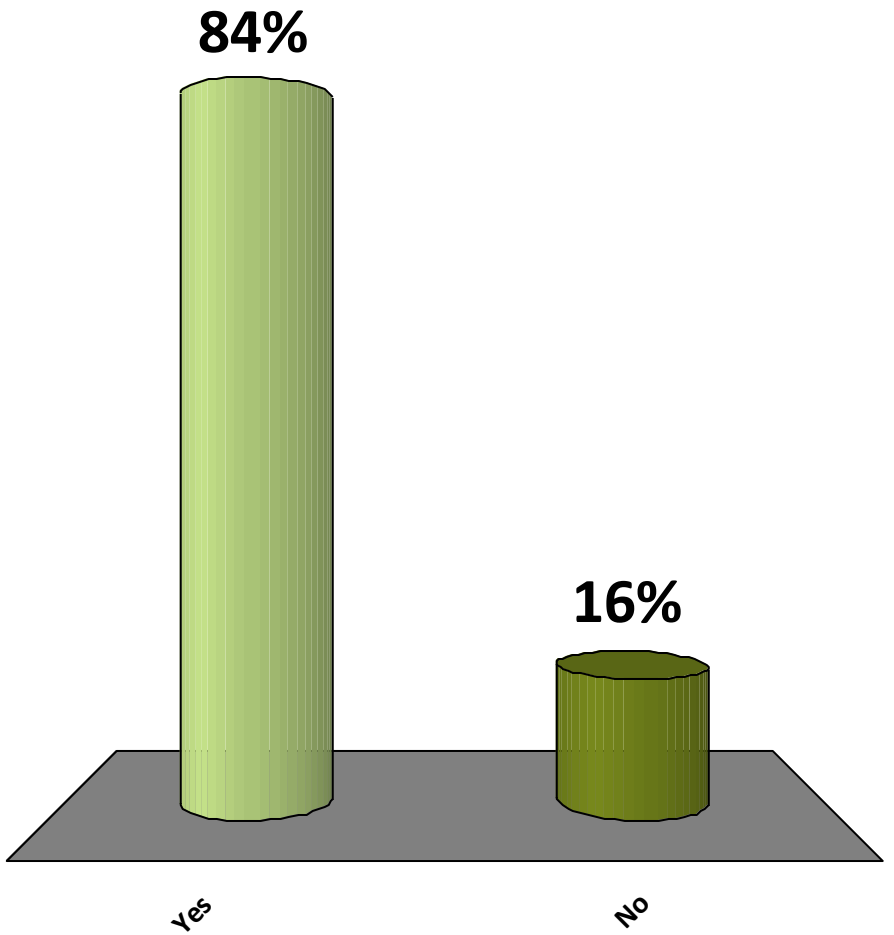
B. No



Will you do anything different in your role, following what has been discussed today?

A. Yes

B. No



Close

Graham Morley

United Utilities
helping life flow smoothly