

6 INDUSTRY COMMENT

# DROWNING IN CONCRETE

Mark Coates on the UK's urban flood crisis and the sponge city solution.

Surface water flooding is becoming one of the most pressing environmental challenges facing cities across the UK. With 4.6m UK properties currently at risk, and projections suggesting this figure could rise to 6.1m between 2040 and 2060, the urgency to act has never been greater. Unlike river or coastal flooding, surface water flooding is unpredictable and often arrives with little warning, leaving homes, infrastructure and entire communities vulnerable.

This issue is being driven by two converging forces: climate change and rapid urbanisation. The UK is experiencing increasingly erratic weather patterns with hotter, drier summers and wetter winters becoming the new norm. In fact, five of the ten wettest years on record have occurred in the 21<sup>st</sup> century. These shifting climate patterns are colliding with our built environment in dangerous ways, transforming everyday rainfall into a significant flood risk.

How can we redesign our cities to better manage water, protect communities and adapt to a changing climate?

**Concrete city costs**

Firstly, we must reassess how towns and cities are built. Urban development has replaced natural, absorbent landscapes with concrete, asphalt and other impermeable surfaces. This shift drastically reduces the land's ability to absorb rainfall, causing excess runoff to overwhelm drainage systems and spill into streets, homes and buildings.

For example, London experienced three extreme rainfall events in July 2021, causing surface water

flooding to shut down eight tube stations and the forced evacuation of Whipps Cross Hospital. The financial impact was significant; insurance and reinsurance industry losses from just the 12–14 July events were estimated at £281m by the insurance data company Perils. With nearly 30% of London properties at high risk of flooding, the capital offers a stark warning of what lies ahead if towns continue to be dominated by impermeable surfaces.

Surface water flooding causes £2.5bn in annual damage. This figure is set to rise to £3.6bn by 2050. As the UK government moves forward with plans to build 1.5m new homes over the next five years, it is essential that these developments are resilient to flooding. Without a shift in how we plan and build, we risk compounding the problem further.

**Sponge solutions**

To reverse this trajectory, we need to rethink how our cities interact with water. Enter the "sponge city"

model – an approach that prioritises green infrastructure and natural water absorption to manage excess rainfall where it falls. At its core are Sustainable Urban Drainage Systems (SuDS), which mimic natural drainage processes and help reduce flood risk while creating healthier, more liveable urban spaces.

Water companies, local councils, flood authorities and community groups all have a role to play. Planning authorities must work together with developers and residents to promote simple, effective drainage solutions such as permeable paving and green roofs and make permeable land a priority in urban design.

However, with public sector budgets under severe pressure (councils have seen a 40% reduction in central government grants between 2009/10 and 2019/20), the financial capacity to deliver large-scale climate resilience projects is increasingly constrained at the local level. This makes the involvement of water companies not just beneficial,



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but essential. With greater access to long-term investment and the infrastructure expertise to deliver at scale, water companies are uniquely positioned to take a more proactive leadership role in building flood-resilient sponge cities.

**Data-driven flood planning**

As the climate crisis evolves, so must our approach to managing it. Surface water flooding is a fast-moving and complex threat, shaped by weather, land use and infrastructure. Tackling it requires integrated water management strategies that account for both current pressures and future risks.

Data and digital tools are essential to this process. High-resolution flood models allow urban planners to simulate different climate scenarios, identify vulnerabilities in drainage systems, and test the effectiveness of mitigation strategies before they're built. These insights highlight critical weak spots such as bottlenecks or poorly designed layouts that would otherwise go unnoticed until failure.

By combining these technologies with legislative support and community engagement, the sponge city concept can become a tangible reality. The recent 'Creating Sponge Cities to Tackle Surface Water Flooding' report examines how to design cities to absorb and adapt to flooding. As we face the twin challenges of climate change and urban growth, building flood-resilient communities must be a top priority for the UK's water sector.