

The IGNITION Project: SuDS-Enabled Trees



GREATER MANCHESTER
DOING THINGS DIFFERENTLY



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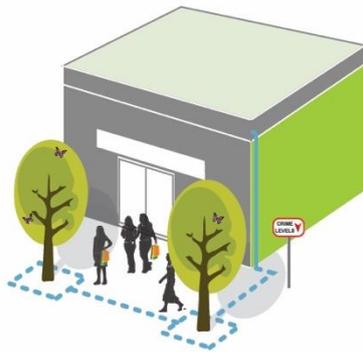


Diagram of street trees

What are SuDS?

Sustainable drainage systems, or SuDS, are a range of structures that manage the flow of rainfall to help ease flooding, improve water quality and boost biodiversity. SuDS link modern drainage processes with the natural water cycle, mimicking nature and managing rainfall close to where it falls.

Typical SuDS include rain gardens, swales, permeable paving, wetlands and green roofs.

What are SuDS-enabled trees?

SuDS can be incorporated into the installation of street trees. SuDS-enabled trees are planted in towns, cities and residential areas

to alleviate the risk of surface-water flooding and reduce the pressures on wastewater treatment works and sewers.

Diverting rainfall before it reaches the surface water drainage network is fundamental to SuDS, controlling the flow of water and tackling pollution such as heavy metals and oils before being released into the sewer system.

Trees for SuDS are planted in specially designed tree pits where surface water on highways, pavements and surrounding buildings is channelled into these pits. This water then gets distributed around the roots where it will be absorbed by the tree or infiltrated by the soil. Once the tree has used what it needs and the soil can't hold much more, the leftover water drains through the tree pit and is sent to the drainage system.

A normal tree can contain 43% of rainfall; a SuDS-enabled street tree can retain 78%

The multiple benefits of street trees

Street trees are any trees planted in an area of hardstanding and can bring many benefits to the built-up area. Whilst they are slightly less beneficial to the area than SuDs-enabled street trees (they do not sit within a specially designed tree pit), they do offer a significant increase in social, ecological and climate benefits.

The IGNITION project has collated a nature-based solutions evidence base to quantify the benefits of street trees and SuDs-enabled street trees. You can access over 1,000 evidence items on their performance on the [IGNITION website](#).

Climate change mitigation



Street trees can absorb up to 5.5kg of carbon per tree a year (the equivalent weight of 37 bananas) and store around 230kg of carbon per tree (the equivalent carbon to 810 car miles).



Restoring nature



Street trees can remove around 0.2kg of nitrogen dioxide and 0.1kg of particulate matter per tree per year from the air.



They can improve water quality by filtering 70% of nitrates from water runoff.



As an increasing number of small mammals and invertebrates face extinction, street trees can play a vital role in developing nature corridors of connectivity between green spaces in urban environments for small mammals and insects.



Reduce noise levels by four decibels per tree.



Street trees can support our health and wellbeing by:



- providing an accessible form of urban nature whilst taking up a small amount of land
- lowering our blood pressure and stress levels when time is spent in sight of and walking around nature
- reducing antidepressant prescriptions levels
- reducing early childhood prevalence of asthma by 29%
- reducing exposure to UV radiation

Street trees can provide financial incentives for developers, owners, occupants, and businesses by:



- increasing property value by around 5% and rent value by around 6%

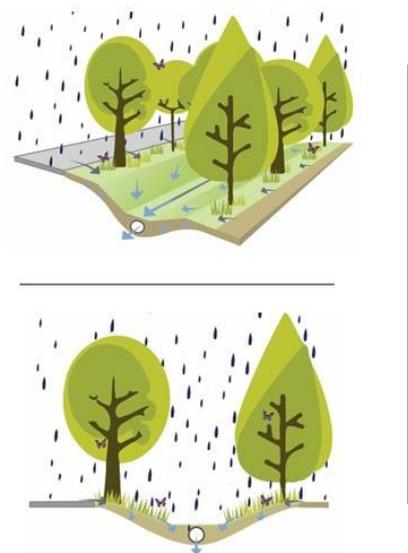


- increasing customers willingness to spend on products by 10-50%



- increasing restaurant patronage by 30-50%
- reducing crime levels by 12% for every 10% increase in canopy cover

Diagram of swale and street trees used together



Case study: Howard Street, Salford



Howard Street SuDs trees

In 2015, City of Trees delivered a street tree planting project on Howard Street in Salford, the first project of its kind in the UK. Three London plane trees were planted into specially adapted tree pits and permeable pavements that can divert surface water.

Using specialist equipment, the University of Manchester can monitor the quantity and quality of the rainwater as it enters and leaves the tree pits. During the first two years of the project (November 2015 – November 2017) these SuDS-enabled trees produced some promising results:

- average peak flow attenuation was 81%, reducing the rate at which rainfall enters the sewer
- average volume of water that ended up in the sewer was reduced by 78%
- average delay of storm water peak flow (the amount of time it took for rainwater entering the system and then leaving via the sewer) was 68 minutes

On the back of this pilot project on Howard Street, there have been other similar projects occurring around Salford. For more information on the work being done around SuDS in Salford see the [Salford City Council website](#).