Tolworth Roundabout
Submitted by Transport for London

Awards category

Regeneration and retrofit – small scale (less than one hectare)

Lead or collaborating organisation(s)	Transport for London FM Conway **Arcadis**
Location of SuDS	E 519778 N 165825

1. SuDS overview

SuDS components used	• raingardens (x5) • permeable pavement (x5 areas) • tree pit (x1) • dry ditch/swale (x1)
Size of the scheme and its local context	This is a dense urban area with ongoing large scale residential and commercial developments. The scheme aimed at improving traffic capacity and improving street design and public realm. The scheme consisted of: • 9,200 m^2 of highway surfacing • 540 m^2 of landscaping • 2,759 m^2 of pedestrian access and cycleway, 1,542 m^2 using permeable paving • 467 m^2 of raingardens The proposals resulted in 5,500m^2 of catchment from adjacent carriageway and footways draining into SuDS.
Approximate age of scheme (years)	• Project inception: 2017 • Construction start: April 2023 • Planned completion: May 2024
Benefits of the scheme	• Managing flood risk: disconnection of 5,500m^2 of surface water runoff from Thames Water sewer at capacity • Water quality: natural filtration and biological treatment of highway runoff • Biodiversity improvements with new green infrastructure and trees within raingardens • Amenity: improved look and feel of urban area • Active travel: a greener, pleasant environment encourages walking and cycling. • Education: improving understanding of SuDS in local community • Sustainability: repurposing an underpass to help tackle climate change impacts.

Briefly describe the scheme	The development of new housing and office spaces leading to significant traffic congestion and an increase of approximately 15 minutes in bus journey times highlighted the need to invest in this area. The objectives of the scheme were to reduce congestion, improve bus journey times, promote active travel, and enhance the street environment by implementing a range of urban realm and greening measures, including SuDS. Flood risk issues with a surcharged combined sewer and low levels of existing greenery meant this was a great opportunity to help meet TfL's strategic goals and demonstrate innovative ways in which TfL can deliver SuDS and provide a rich, functional, and biodiverse landscape at the roundabout. The SuDS design included flow control devices to attenuate surface water runoff for 1:10 years return period and discharge back at close as possible from greenfield runoff to combined sewer serving the area. TfL multidisciplinary design followed a flexible and iterative approach to identifying SuDS opportunities as survey information became available. TfL ensured the rain gardens were planted with a mix of plant species that will tolerate current and future environmental conditions and add to the amenity of the area without placing onerous maintenance costs on TfL.

2. SuDS details

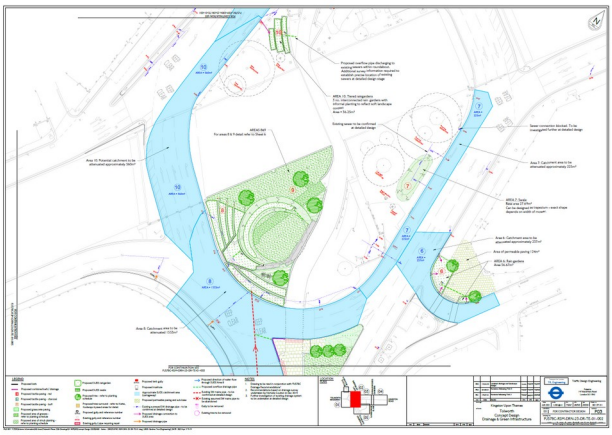
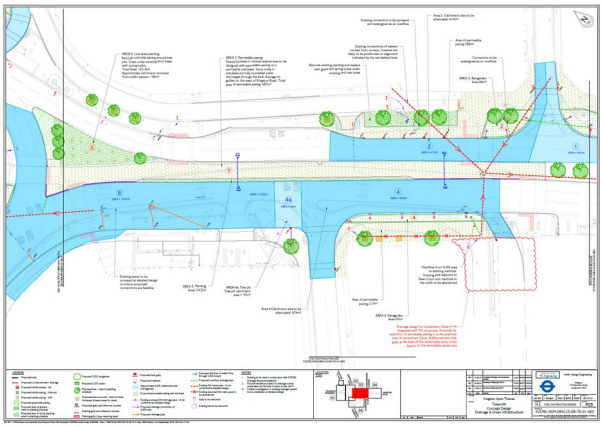
No.	Question	Answer
1	What difference has this scheme made to the local community or area?	**Water Quantity**: SuDS attenuate approximately 5,500m2 of catchment area with a controlled discharge. **Water Quality**: SuDs provide natural treatment to highway water runoff. **Biodiversity:** trees and planting provide food for wildlife and pollinators. Tree species include Hawthorn, Birch and Serviceberry. Planting mixes include nectar rich species including Phlox, Stone crop and Yarrows. **Amenity**: year-round visual provided by a mix of grasses, shrubs and perennials. The central cascade provides a green space along the greenway walking and cycling route to engage with nature. **Education**: an information board will explain the purpose and benefits of the SuDS to the local community.

2	What is exceptional about this scheme beyond a standard approach?	The design successfully achieves a range of TfL goals from safety to climate resilience through a catchment-wide SuDS strategy in a challenging, complex highway location. It showcases innovative ways in which TfL can deliver SuDS, such as using the closure of an outdated subway through the roundabout as an opportunity to design a multi-functional and biodiverse water-management landscape. The approach to planting balanced the need for low maintenance green infrastructure with the drive to increase biodiversity and visual amenity. TfL multidisciplinary design followed a flexible and iterative approach to identifying SuDS opportunities as surveys became available to maximise SuDS opportunities.
3	How much work went into getting this scheme realised?	We knew our SuDS ambition and there was an appetite for change, but existing systems in TfL worked against taking a more agile approach to delivery, which we had to overcome. This scheme needed to embrace a collaborative approach within TfL but also with our supply chain to ensure our ambitions were aligned and risks were mitigated. Working in a dense urban area meant that our delivery was concomitant with lots of work going on at the same time. In addition, space had to be maximised for the SuDS delivery, while taking into account maintaining access and safety.
4	Is this scheme part of a masterplan or integrated into other initiatives?	The Royal Borough of Kingston upon Thames delivered improvements to cycling and walking as part of their successful mini-Holland programme. This involved a shared bi-directional cycle track – the Greenway – located within the central reservation. We sought to extend the Greenway south along Kingston Road to provide a high-quality link to Tolworth Railway Station and tie into existing cycleway. In addition, this area has new planned housing and office spaces development, which could lead to a significant increase in traffic congestion. This highlighted the need to invest in this junction to reduce congestion, improve bus journey times and promote active travel.

5	What value does this scheme provide to the local area and beyond?	We consulted with politicians, borough officers, local businesses and residents, accessibility and passenger groups, and road users to ensure that this scheme will provide values to all: • Enhance air quality. • Improve bus journey times and reliability. • Promote cycling and walking by creating safe and high-quality connections across the A3. • Extend the existing Greenway in Tolworth Broadway to Kingston Road. • Enhance the street environment to encourage active travel, enhancing cycling and walking links between the rail station and town centre. • Implement a range of urban realm and greening measures. • Educate the local community of the SuDS benefits.
6	What challenges/problems needed to be addressed to realise this scheme?	The status quo of a more traditional approach to drainage systems had to be challenged. SuDS were not embedded at the feasibility stage – the commitment to include them across the network was set out in our recent Adaptation Plan. Not embedding SuDS from the beginning meant there was a delay to the programme and an increase in project costs as a result. Technical challenges included London Clay and numerous utilities. These needed a pragmatic and flexible approach to design and construction. Affordability issues had to be overcome with a successful application for Thames Water SWMP funding.
7	How does the scheme address related issues such as water scarcity, nutrient neutrality, or biodiversity net gain?	Planning permission was not required for this highway project and so it does not trigger proof of nutrient neutrality or Biodiversity Net Gain requirements. However, planting will not use fertilisers and the planting within the SuDS will help treat the highway run-off. In addition, the project will deliver a net gain of eight trees, along with other GI and biodiversity improvements.

8	Is learning from the scheme continually captured and communicated? Please give examples.	During design development, TfL's Engineering team ran peer reviews with Urban Design London (UDL) and we have since shared our own learning with UDL and the Boroughs. Internally, this scheme has been presented in multiple workshops, meetings and more formal training to upskill and educate all our colleagues in TfL. This project formed the basis for the development of a TfL SuDS standard and design guidance within TfL. Lessons learned are captured under TfL's Project Delivery Process, including with our supply chain, with which we are building a long-term working relationship for future SuDS schemes.
9	What approaches/measures are taken to ensure the scheme is properly managed and maintained?	We worked with our Asset Operation colleagues during the development of a maintenance regime for the new SuDS components. This included a site visit to Australia Road in White City with similar permeable paving and raingardens. A reduced mowing regime to promote biodiversity will be applied in the central roundabout area, similar to that used on other TfL verges to promote wildflower growth. We have developed our own technical standard to define performance requirements for the maintenance of SuDS in TfL. TfL's Asset Operation Team will be formally engaged during snagging and handover of the scheme.
10	Have you collected any feedback on your scheme? What do people say about it? Can you provide any quotes?	A schedule was developed to guide stakeholder engagement and communications, with a log maintained to record all interactions with stakeholders. In addition to the online consultation, we sent letters to 1,987 residents living in the vicinity of the junction. Furthermore, we sent emails to 6,255 customers who registered their Oyster card with us. From this, we received 232 responses to the consultation, with 225 coming from members of the public. TfL also reached out to the wider community via an interview with the Good Life Surbiton (local newspaper) to raise awareness and interest beyond the scheme boundary. https://thegoodlifesurbiton.co.uk/

3. Supporting materials

Image (low resolution)	Caption	Image credit
	Proposed drainage layout – Tolworth roundabout. SuDS from 6 to 10, total catchment 2300m^2	TfL
	Proposed drainage layout – A240 Kingston Road. SuDS from 1 to 5, total catchment 3200m^2	TfL
	View of A240 Kingston Road, northbound carriageway. A side road and parking bays occupy an area between the front of Dean Court (to the left) and the main carriageway.	Google Streetview

	89m^2 rain garden, 217m^2 permeable paving (to the left) have been built in front of Dean Court. Water runoff enters from carriageway through kerb openings. The total catchment is 1070m^2.	TfL
	View of the junction between Tolworth Roundabout and Barnsbury Lane. The underpass to the left was proposed to be removed.	TfL
	A 40m^2 rain garden has been built in the location of the removed underpass. 124m^2 of permeable paving has been built adjacent to it. The overall catchment is 410m^2.	TfL
	View of the underpass, proposed for removal, connecting south of the roundabout to the footpaths within the roundabout.	TfL

	Four-tiered rain garden system, built using gabion walls, in the area previously occupied by the underpass. Carriageway runoff enters the top tier and eventually reach the central area between the retaining walls. Two swales are intercepting runoff from the surrounding landscaping. The total attenuated catchment is 1500m^2.	TfL