

**Blue Green Dream applied research:
Costing the benefits of Blue Green Solutions**

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Achieving the **Blue Green** Dream
London
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Blue Green Dream
#BGDachieving

Objectives

To deliver a step-change in **cost-benefit** analysis of **SuDS retrofitting** by providing:

- Flood risk mitigation solutions for the **Decoy Brook** catchment
- New evidence for regulatory frameworks regarding factors that determine cost-effectiveness of **Blue Green Solutions**
- Example of a **partnership model** for funding the proposed set of solutions



Team

Imperial College London:

- **Juan Ossa Moreno**
- Dr Karl Smith
- Prof Cedo Maksimovic
- *Dr Ana Mijic (PI)*

Environment Agency:

- Marius Greaves
- Chris Thilthorpe

AECOM:

- Mike Henderson

London Borough of Barnet:

- Chris Chrysostomou

Deltares:

- Prof Frans van de Ven
- Dr Reinder Brolsma

Imperial College
London



AECOM

BARNET
LONDON BOROUGH

Deltares
Enabling Delta Life 

Methodology

**SUDS mapping for Decoy
Brook Catchment**

Stakeholders participatory
workshop

Adaptation Support Tool
[Deltares]

Cost-benefit analysis

Multi-Colored Manual

Benefits SuDS Tool [CIRIA]

Example of a funding model

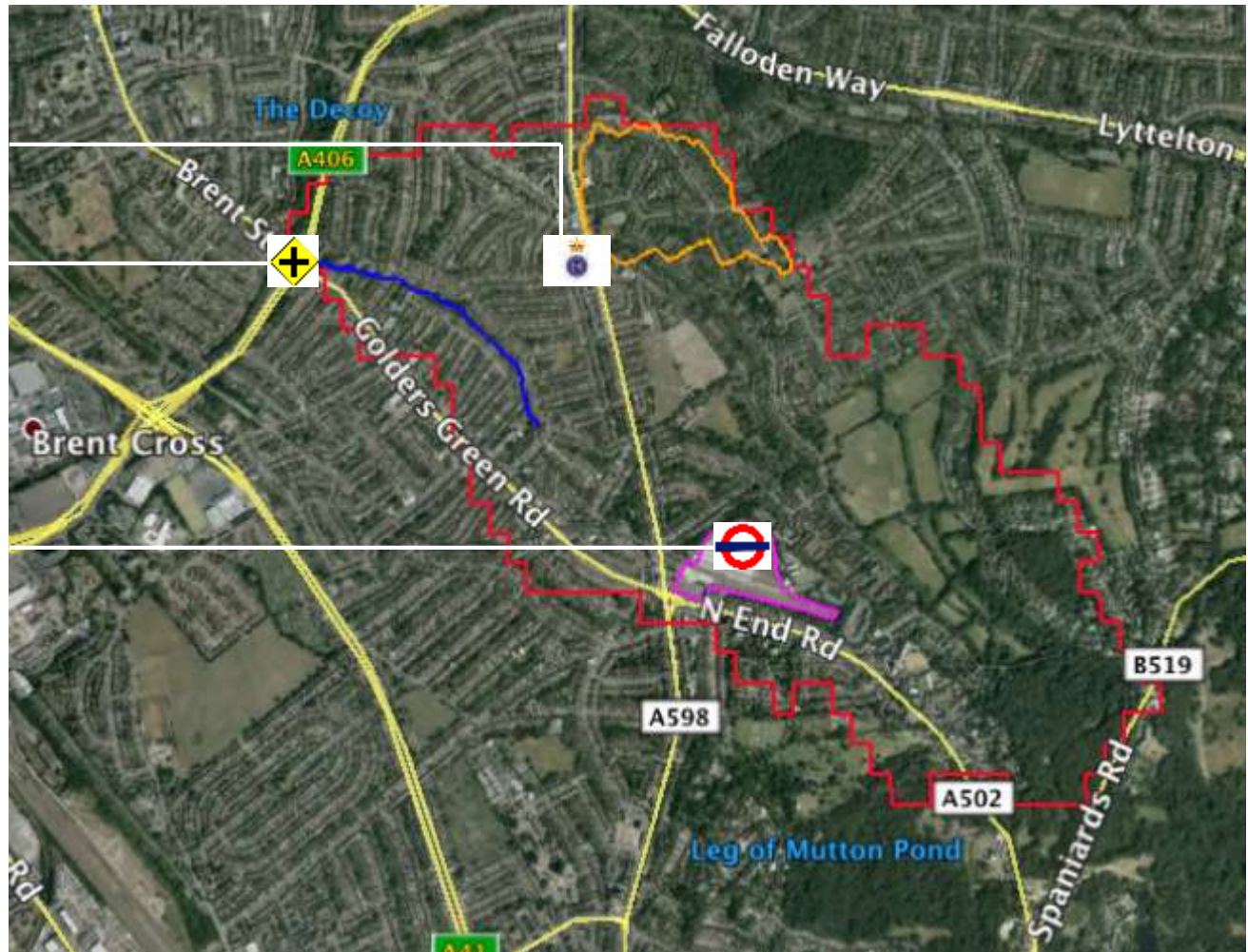
Decoy Brook catchment: Infrastructure at flooding risk

Finchley Road
Police Station

A502 and
A406
intersection

Golders Green
Station and
Northern line
railway

One school
13 Electricity
installations



Participatory workshop

- Mapping of potential intervention measures
- Transferring ideas into the AST using the maptable

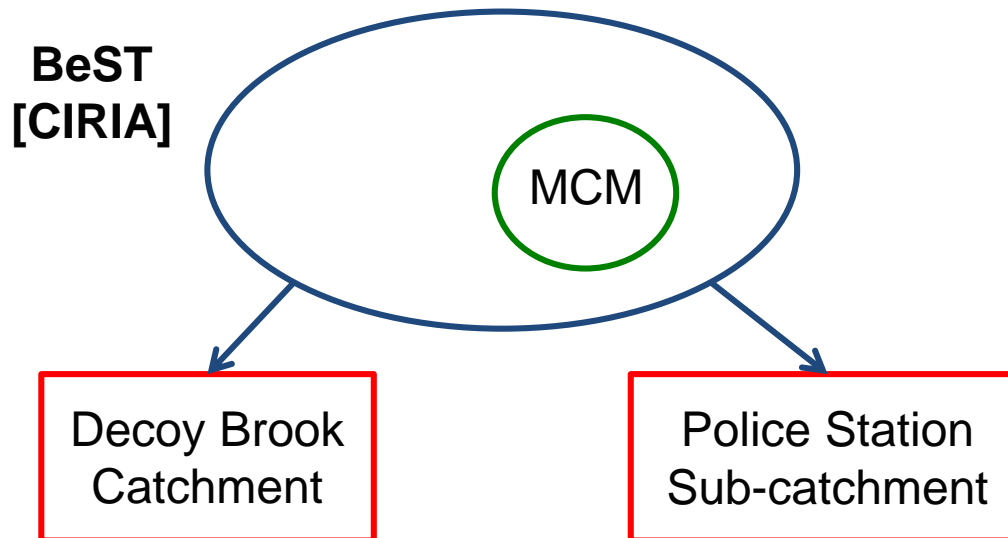


AST Sub-catchment scale solution: Police station



Cost-Benefit Analysis: MCM vs. BeST

The main difference between BeST and the MCM is that the latter is a tool to appraise benefits associated to **flooding only**, while the former takes into account **wider benefits**



MCM results

	Cost	MCM Flood Benefits	NPV* Flood Benefits	BCR** Flood Benefits
SUDS 1	£521,837	£158,758	-£363,079	0.32
SUDS 2	£460,110	£290,241	-£169,869	0.66
SUDS 3	£519,318	£319,589	-£199,729	0.64
SUDS 4	£981,947	£448,999	-£532,948	0.47
SUDS 5	£979,428	£609,830	-£369,598	0.65

*NPV = Net Present Value

**BCR = Benefit Cost Ratio Benefits

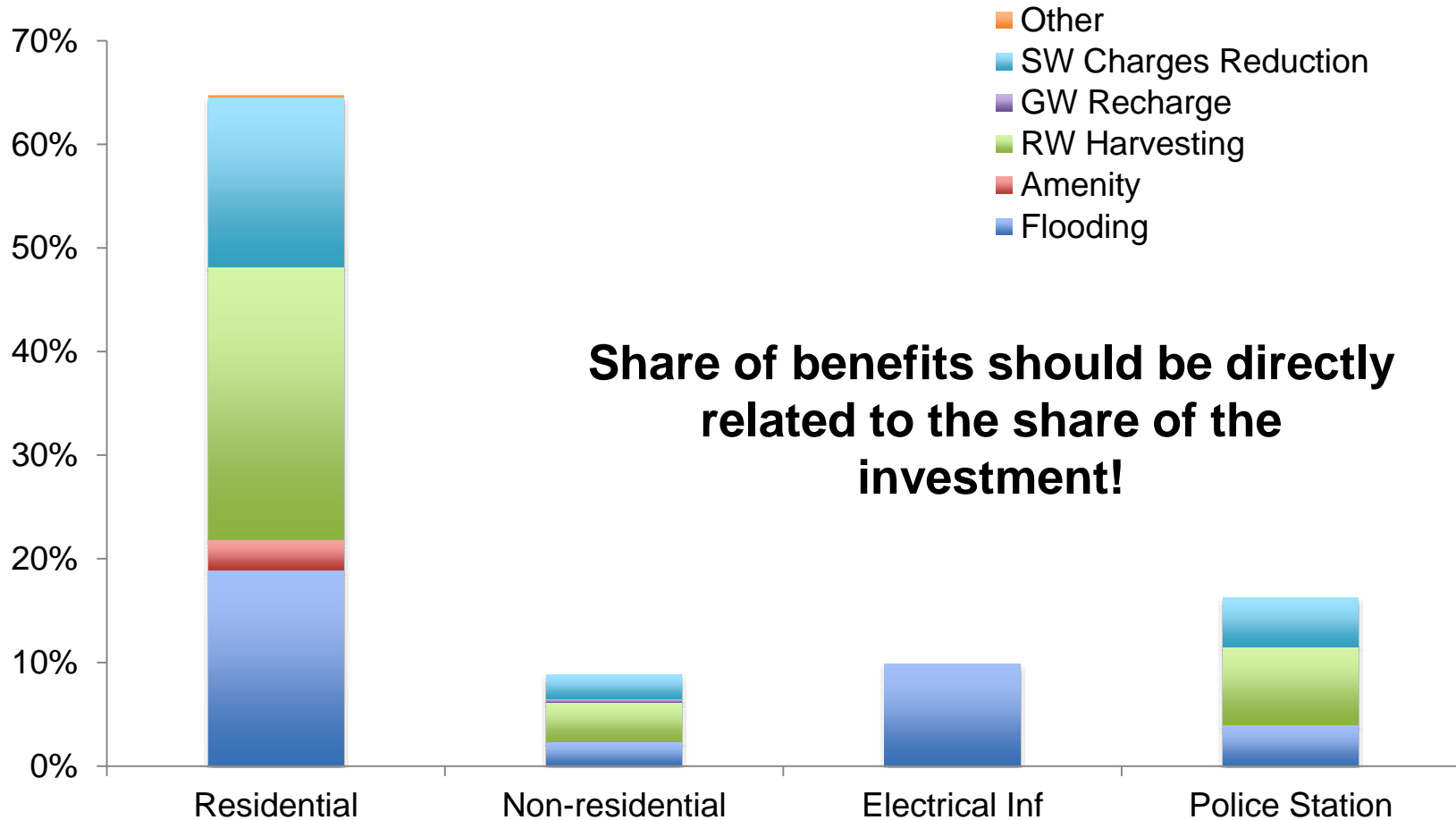
BeST results

	Cost	BeST Wider Benefits	NPV* Wider Benefits	BCR** Wider Benefits	BeST % of total BCR
SUDS 1	£521,837	£459,100	-£62,737	0.91	65
SUDS 2	£460,110	£470,495	£10,385	1.06	38
SUDS 3	£519,318	£910,278	£390,960	1.82	65
SUDS 4	£981,947	£919,206	-£62,741	0.97	52
SUDS 5	£979,428	£1,380,773	£401,345	1.46	55

*NPV = Net Present Value

**BCR = Benefit Cost Ratio Benefits

Breakdown of benefits for Police Station



Conclusions

- **Assessment of wider benefits using BeST CIRIA tool improved the feasibility of SuDS**
- Ponds and rainwater tanks were the most cost-efficient SuDS
- Operation & Maintenance costs can represent almost 50% of the Whole Life Cost for some SuDS
- **Need for new SuDS funding models:**
 - Targeted direct incentives from public institutions to reduce private CAPEX
 - Indirect incentives from water utilities to ensure payback
 - A guidance to manage SuDS performance
 - A leading position of public institutions to coordinate stakeholders' participation

Counters Creek SuDS retrofit:
CDT in Sustainable Civil
Engineering 50:50+ scheme **PhD
project** with **Thames Water** on
full scale performance
assessment of SuDS

**SuDS and rainwater
harvesting:** InnoH2O H2020
Innovation proposal led by the
University of Exeter

Blue Green Dream
current and future applied research

**Green Roof Optioneering for
Water- and Thermo-
performance (GROWTh):**
NERC GI Innovation proposal
with Zinco and London Borough
of Hackney on green roof
assessment tool

BG Solutions and urban groundwater:
*Groundwater Infiltration into Urban
Infrastructure Centre for Research and
Innovation* with Atkins, BGS and University
of Birmingham;
NERC DTP PhD project proposal with
Kent County Council, EA, Southern
Water and Thanet District Council

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