A12: GREEN MILE

POPLAR HARCA

TOWER HAMLETS

CREDITS

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the Poplar Housing and Regeneration Community Association
and the London Borough of Tower Hamlets
in liason with Transport for London.

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SUMMARY AND OVERVIEW

Ensuring London's roads function smoothly is central to maintaining its role as a leading world city. However, London is not only in competition with New York, Tokyo and Paris in terms of efficiency but also the quality of life that it delivers for residents and businesses. Often the place function of streets has been sacrificed in subservience to their movement function. This has led to areas of London becoming no-go areas for pedestrians, cutting off communities from their neighbours and condemning residents to high levels of air and noise pollution.

The A12 from the Bow Roundabout to the Blackwall Tunnel is a strategically important arterial road that runs through an area that has both significant concentrations of deprivation and opportunities for new development. Whilst a few areas of London have higher levels of noise pollution, they have lower densities of residential population; it is possible to hypothecate that more Poplar residents are regularly subjected to extreme levels of air and noise pollution than anywhere else in London.

Evidence is pointing to long-term exposure to high levels of air pollution being more important than exposure to peaks of air pollution.

The London Borough of Tower Hamlets (LBTH) and Poplar HARCA are keen to work with partners to design, fund, implement and evaluate a range of projects driven by green infrastructure that humanise the A12 and its environs so as to:

- improve the physical connections between communities;
- deliver short, medium and long term health benefits to those living and working in the local area;
- improve the context of, and prospects for, new development;
- reduce localised flooding;
- create biodiversity corridors; and,
- alleviate the impact of the noise and air pollution that blights the lives of residents.

It is believed that all of this can be delivered without reducing traffic flow on the A12.

We are already working closely with Transport for London and the London Legacy Development Corporation to improve the east-west routes through the residential areas to the west of the A12 and to tie them into the proposed new 'Leaway' walk, east of the A12 that will connect the River Thames to the Queen Elizabeth Olympic Park.

This feasibility report sets out a joined-up programme of innovative green infrastructure projects to be implemented along the A12 and the environs of Poplar.

There is a significant opportunity to tie these 'A12: Green Mile' projects in with the Transport for London sponsored SKM/Jacobs Study currently investigating the access and function of the A12 as well as other regional and national initiatives looking at noise reduction, mitigating air pollution, increasing flood reduction and improving community resilience.

The London Borough of Tower Hamlets and Poplar HARCA have already engaged academic partners to help design this programme and the underlying scientific research.

We are seeking further partners to help refine this programme and source funding for the implementation, monitoring and evaluation of this new approach to using green infrastructure to humanise a major arterial road.

THIS FEASIBILITY REPORT SETS OUT A JOINED-UP PROGRAMME OF INNOVATIVE GREEN INFRASTRUCTURE PROJECTS TO BE IMPLEMENTED ALONG THE A12 AND THE ENVIRONS OF POPLAR.

BACKGROUND AND BASELINE

Pollutant	Government Objective	Year						
		2013	2012	2011	2010	2009	2008	2007
PM10 Particulate	*40 ug/ m3 as an annual mean*	27 ug/m3	26 ug/m3	28 ug/m3	*	34 ug/m3	36 ug/m3	35 ug/m3
PM10 Particulate	*50 ug/m3 as a 24 hour mean, not to be exceeded more than 35 times a year*	23 times exceeded	24 times exceeded	32 times exceeded	*	42 times exceeded	59 times exceeded	56 times exceeded
Nitrogen Dioxide	*200 ug/m3 as a 1 hour mean, not to be exceeded more than 18 times a year*	0 times exceeded	0 times exceeded	0 times exceeded	7 times exceeded	2 times exceeded	3 times exceeded	*
Nitrogen Dioxide	*40 ug/m3 as an annual mean*	58 ug/m3	61 ug/m3	63 ug/m3	73 ug/m3	64 ug/m3	63 ug/m3	*

Air Quality

Some 38,000 cars pass along this stretch of the A12 on a daily basis and it has been identified as one of the Mayor's Air Quality Focus Areas. Data from the official air quality monitoring station located at the junction of the A12 and Abbott Road reveals that the site exceeded government objectives for the level of Nitrogen Dioxide in 2012 (and every year from 2008 when this objective was set). Historically, the site has also regularly exceeded the government objective for the number of occasions in a year where daily PM10 averages over 50 ug/m3. However, the location of the monitoring station is almost 400m away from where the highest concentrations of air pollution are most likely to be found; around the junction of the A12 and the A13/ East India Dock Road. As such, it is fair to assume that these values are conservative estimates of peak levels.

Flooding

Although there are no historical records of surface water flooding, the location is considered to be at high risk of surface water flooding due to its low elevation and the impervious nature of some of the dense urban development in the area. Incidences of flash flooding have caused disruption to the Blackwall Tunnel Northern Approach, and in particular beneath the Bow Flyover.

SOME 38,000 CARS PASS ALONG THIS STRETCH OF THE A12 ON A DAILY BASIS AND IT HAS BEEN IDENTIFIED AS ONE OF THE MAYOR'S AIR QUALITY FOCUS AREAS.

Noise

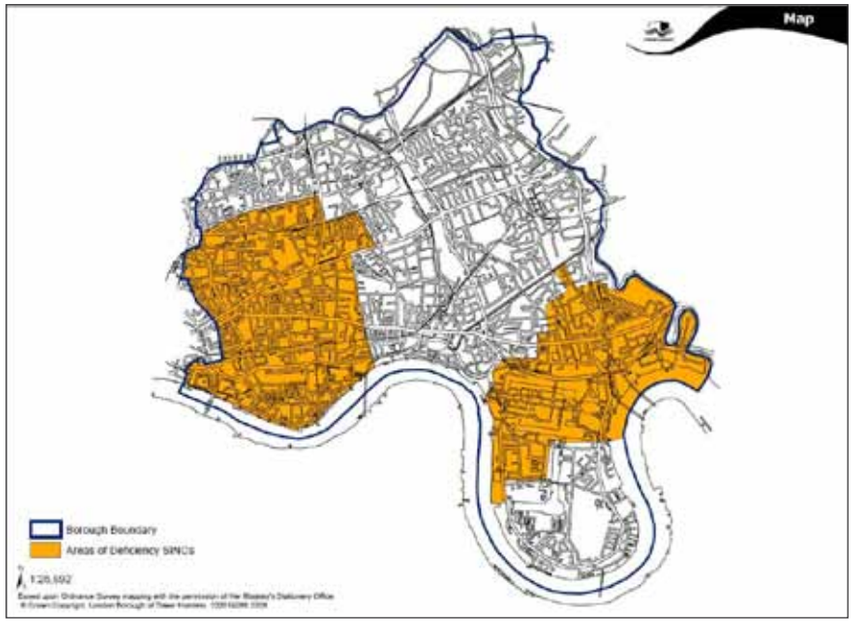
Recent noise surveys carried out along the route show that some residents to the east and west of the A12 experience noise levels from road traffic in excess 70dB(A) during the day, with a very large number experiencing daytime noise over 55db. This is further exacerbated by noise from the flight path to and from London City Airport which passes over the area. The noise levels at night are in excess of 60db in some locations and over 55db in many others.

The World Health Organization (WHO) states that "*to protect the majority of people from being seriously annoyed during the day-time, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB LAeq for a steady continuous noise. At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB LAeq and 60 dB LAmax, so that people may sleep with bedroom windows open*" (WHO, 1999 Environment).

Biodiversity

Tower Hamlets is very urbanised, even for a London Borough, with only fifteen per cent of its surface area covered with green space (Better Environment, Better Health — GLA Guide). This represents sixteen percent below the London average. Despite being one of the most deprived and densely populated areas of the UK, Tower Hamlets has a wide array of wildlife. This is reflected in the Tower Hamlets Biodiversity Action Plan.

When the Mayor of London published 'Connecting with London's Nature' in 2002, it represented the first statutory Biodiversity Strategy at regional level. The strategy established two key targets as measures of success; that there is no net loss of important wildlife habitat in the Greater London area, and that areas of deficiency in accessible wildlife sites are reduced. These targets were embedded in each Local Authority's Biodiversity Action Plan.



Within Tower Hamlets as a whole, over 50 per cent of households in 5 out of 17 wards have deficient access to nature. This means that people living and working in these areas have little access to observe and interact with wildlife. These deficient areas are focused on two geographical areas within the Borough *(see above Figure)*.

The A12: Green Mile's study area, bordering the Blackwall Tunnel Northern Approach, sits within one of these two areas.

Key targets for Biodiversity Enhancement Zones include:

- Incorporating opportunities for biodiversity within the built environment
- Ensuring communities are able to experience urban wildlife locally
- Enhancing habitat connectivity for wildlife through the Borough.

Green infrastructure initiatives proposed in the A12: Green Mile Programme would support all three of these targets complementing the Borough's Local Biodiversity Action Plan to address these deficiencies.

HEALTH AND WELLBEING

Tower Hamlets is 134th out of 149 local authorities in terms of deaths from lung disease (Public Health England: Healthier Lives Project) and 144th out of 150 in terms of deaths from heart disease and strokes; which are increasingly linked with air pollution. It is estimated that air pollution reduces life expectancy in the UK by seven to eight months.

In Tower Hamlets in 2008 it is calculated that there were 108 additional deaths attributable to small particle (pm2.5) air pollution alone (GLA 2013). Poor air quality combined with high temperatures increases the risk of cardiovascular and respiratory diseases. Air pollution has also been linked with lung cancer and low birth weight.

In April 2014, Public Health England published one of the first comprehensive assessments of the impact of air pollution on the mortality of people in different local authority areas. Tower Hamlets had the third highest proportion of death that could be attributable to air pollution in the country, behind only Westminster and Kensington and Chelsea. It is possible to hypothesise that within Tower Hamlets these deaths would most likely be concentrated in areas close to the highest levels of PM2.5 including the A12.

DEVELOPMENT

The area in the immediate vicinity of the A12 route has seen the introduction of a number of new residential buildings. There are also a number of remaining large scale development sites and areas with pressure for redevelopment.

IT IS ESTIMATED THAT THERE COULD BE SOME 5000 NEW HOMES INTRODUCED WITHIN THE NEXT 10 YEARS [...] AS A RESULT, THOUSANDS MORE PEOPLE WILL BE LIVING IN PROXIMITY TO THE A12.

Along this section of the A12 alone, it is estimated that there could be some 5000 new homes introduced within the next 10 years, as well as schools, health centres and other community facilities. As a result, thousands more people will be living in proximity to the A12. In terms of connectivity, the 6 lane highway currently presents a significant east-west barrier limiting resident's easy access to services and facilities. Overcoming this disconnection is one of the key issues currently being considered in a study by Transport for London.

Transport for London — Roads Task Force

The A12: Green Mile programme of research and demonstration activity has the potential to provide new understanding in terms of the value of green and blue infrastructure in enhancing the living and sustaining functions of arterial roads in London's Street Family, at little or no impact to the movement function. It also has the potential to provide an alternative, less expensive approach to mitigating the impact of arterial roads, short of putting them in tunnels or bridging over them (TfL toolbox 5).

The outcomes of the research can inform the development of TfL's 'Infrastructure and Assets fit for the future' toolbox, developing a business case for green infrastructure investment in mitigating pollution, including hypothecating health budgets.

Similarly, the streetscape guidance to be published in 2014 can be informed by the initial findings of this research, in particular in what context green walls/roofs should be promoted along arterial roads.

Current work on the A12

Transport for London have commissioned an A12 regeneration and connectivity study. The work is being carried out by SKM and the results are due to be published in July 2014.

The area being considered runs from the Bow Roundabout (A12 junction with the A11) to the entrance with the Blackwall Tunnel. The Brief recognises that the A12 is one of the Capital's busiest and most strategically important roads and that it also runs through an area experiencing widespread regeneration and growth in housing and employment.

The publication of the Roads Task Force report marks a change in the approach to the management of, and investment in, London's roads. The RTF's recommendations aim to enable people and vehicles to move more efficiently on London's streets; to transform the environment for cycling, walking and public transport and improve the public realm and provide better and safer places for all the activities that take place on the city's streets, and provide an enhanced quality of life.

The study's approach is consistent with these aims and seeks to develop proposals which reduce the severance caused by the A12, by looking at how existing and new communities and facilities can be better connected together and how regeneration can be supported but which ensure the important movement function of the A12 is not overly impacted. In addition, proposals which mitigate the environmental impacts of the A12 on the local communities will be developed.

RESEARCH CONTEXT AND AIMS

Institute for Sustainability

The Institute for Sustainability and the University of East London have joined with LBTH and Poplar HARCA to provide the skills to monitor the impact of these measures – specifically noise and air pollution and flood protection – on people and place. Poplar HARCA will also engage its green network of urban growing groups, groups engaged in mapping and supporting biodiversity and other green-minded residents to support the design, delivering and maintenance of these projects.

THERE IS A NEED TO DEVELOP AND MONITOR 'NOVEL' BIODIVERSITY-FOCUSED DESIGNS FOR GREEN INFRASTRUCTURE [...] AND INVESTIGATE THEIR CONTRIBUTION TO URBAN BIODIVERSITY AND ECOSYSTEM SERVICE PROVISION.

As part of research funded by EU FP7, the Institute for Sustainability will investigate the prevalence and pattern of respiratory illness by surveying local GPs. Area based research will also explore the perceptions of residents and visitors up and down the A12 to identify 'hot spots' of perceived air and noise pollution, as well as the impact of projects on perceptions of the area. The core objectives of this programme are to reduce local air and noise pollution, improve the collective understanding of how such GI measures should be designed and how a business case for their funding can be developed (in particular, the hypothecation of public health funding). Key to this research programme will be addressing research gaps with particular reference to multifunctional ecosystem service provision and experimental case studies taking a holistic approach to retrofitting sustainability and resilience into urban communities.

Whilst there is an increasing body of evidence linking urban green infrastructure interventions with ecosystem service and economic benefits including storm water amelioration, pollution uptake, energy conservation, urban heat island mitigation, health and wellbeing, and a resource for urban biodiversity, research in this area is still very much in its infancy. This is particularly the case in relation to using regional context to inform habitat design and understanding the links between designing for biodiversity and maximising resilience and ecosystem service provision.

Green infrastructure in the built environment has traditionally been designed with limited consideration for biodiversity or regional context.

UEL University of East London

Instead, a blend of horticultural fascination with exotic species, ease of maintenance, accessibility and an innate desire to control nature have led to aesthetic appeal and amenity value being the key drivers for urban greenspace design. Even selection of species suited to local climates has been limited with artificial irrigation and heavy management of urban landscapes common place.

Given the increasing recognition that the natural environment can provide goods and services of benefit to humans and the planet, the European Commission, the UK Government and Local Authorities are now advocating well-planned green infrastructure that provides opportunities to protect and enhance biodiversity. In response to this, there is a need to develop and monitor 'novel' biodiversity-focused designs for green infrastructure at roof, wall and ground-level, and investigate their contribution to urban biodiversity and ecosystem service provision.

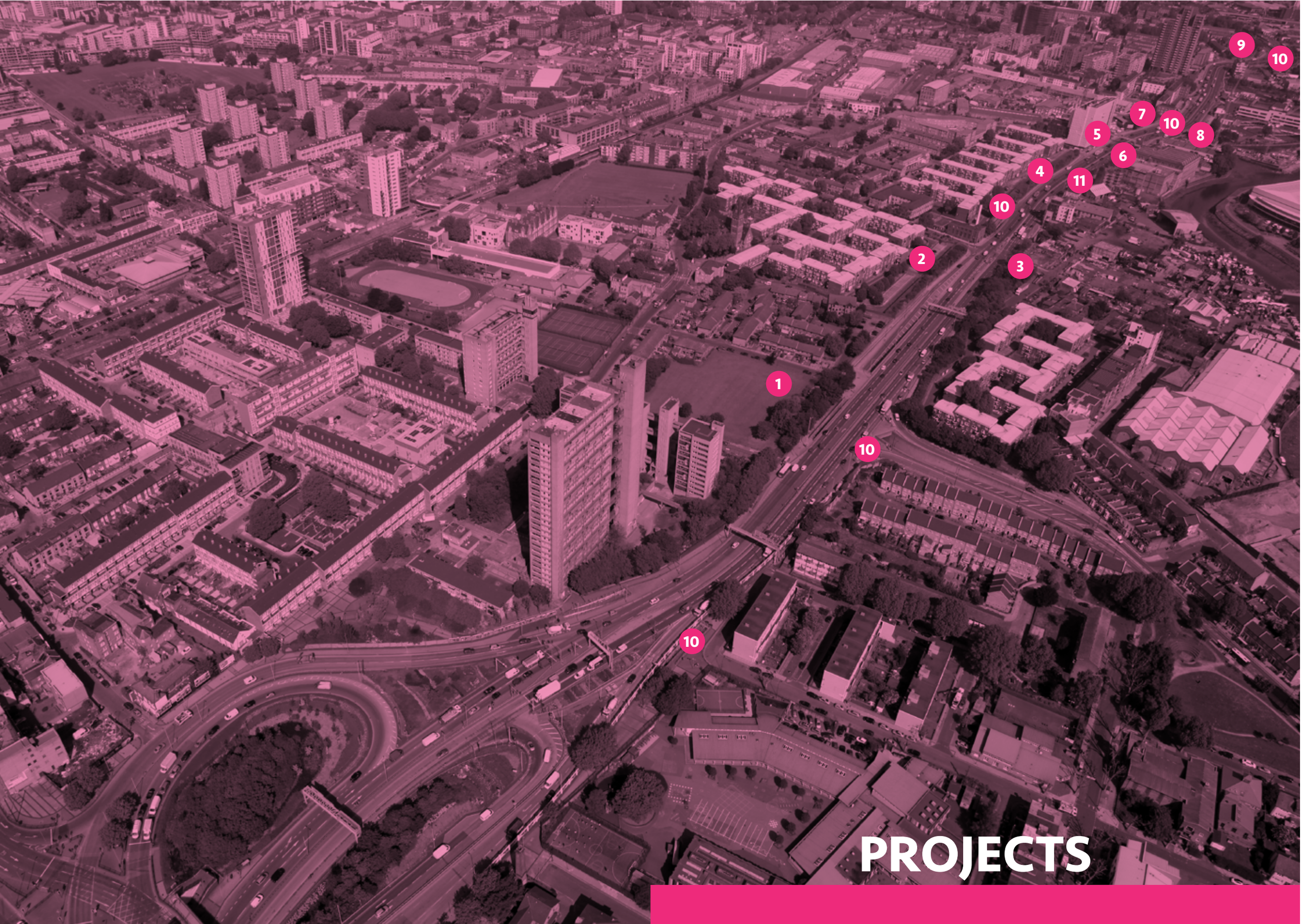
The key first step to maximising the resilience and sustainability in such a process is ensuring that design is based on regional context both in terms of being current climate and climate adaptation resilient, relevant to regional biodiversity (specifically that of national and international conservation value) and targeted towards local environmental hotspots.

Taking such an approach not only maximises the biodiversity and associated ecosystem service benefits, but also facilitates more sustainable urban green infrastructure management with reduced requirements for fossil fuel use, artificial irrigation, and fertilizer and pesticide input.

This principle is key to the design, implementation and monitoring of the proposed A12: Green Mile green infrastructure interventions. The precise research hypotheses for each project will be agreed with relevant partners. In some cases due to the long term nature of the research and the limited funds currently available, additional bids for research funding will be made to the EU and UK research councils. Of central importance is the purchasing of various sensors that will enable the accurate monitoring and verification of air pollution, noise pollution, surface water run-off and water quality, that are rarely funded by the research funds outlined above.

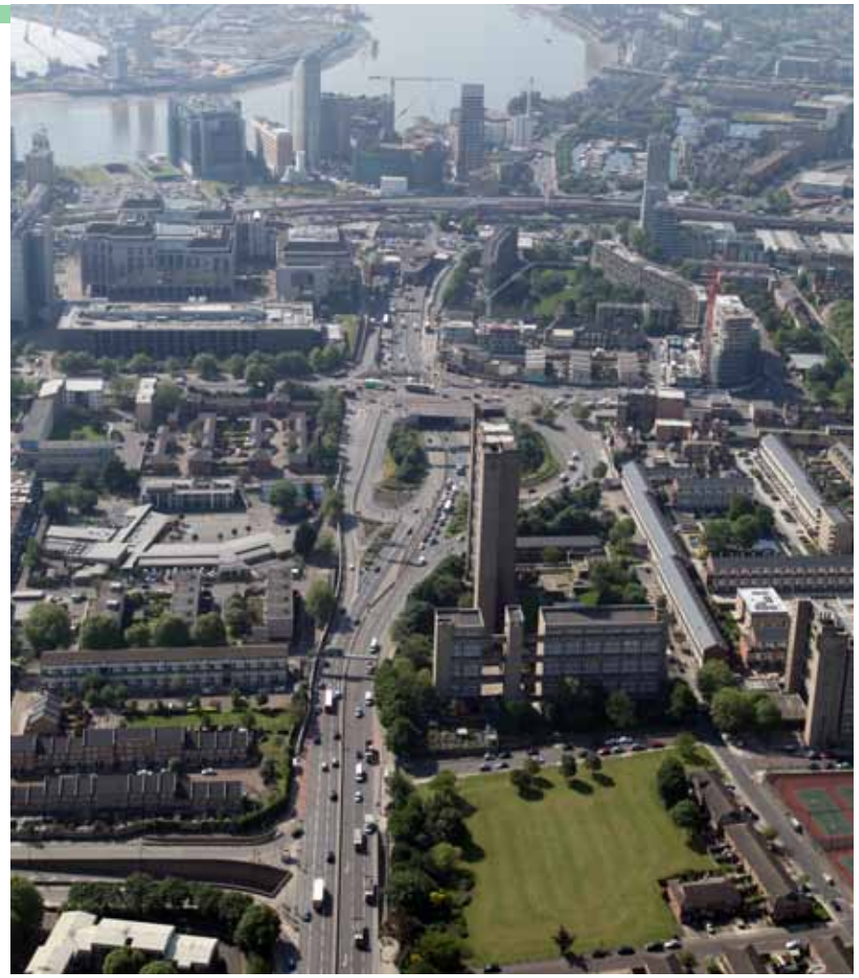
TAKING SUCH AN APPROACH [...] FACILITATES MORE SUSTAINABLE URBAN GREEN INFRASTRUCTURE MANAGEMENT WITH REDUCED REQUIREMENTS FOR FOSSIL FUEL USE, ARTIFICIAL IRRIGATION, AND FERTILIZER AND PESTICIDE INPUT.

It will not be necessary to deploy a full sensor array on each of the projects as it will be possible to deploy different sensors on different projects at different times. Once the funded A12: Green Mile programme is fixed, a detailed research programme will be developed that sets out which monitoring will take place to capture baseline and post-implementation data on each of the projects and hence the precise requirements for sensors. Nevertheless a core programme budget for sensors and monitoring equipment of £40,000 has been identified. In addition, each of the individual projects below includes a small budget for the staff resources required to collect, interpret and report the data.



PROJECTS

PROJECTS



Strategic research and demonstration projects have been identified and a profile of each, including maps, pictures and outline costs is set out below.

This shortlist includes common types of intervention that could be replicated along the A12 and other arterial routes across London.

Also included are other projects that partners are seeking support and funding for elsewhere along the A12 that will add to the overall A12: Green Mile ambition.

KEY

- **Preparation**
- **Design**
- **Implementation**
- **Monitoring and Reporting**

FINANCIAL PROFILING OVERVIEW (IN £K)

		Total
1	Jolly's Green : Green Wall	190
2	Brion Place : Green Graffiti	5
3	Lochnagar Street : Community Garden	42.5
4	Teviot Garages : Sound Wall	118.5
5	Lime Quay : Noise Barrier	35
6	Gillender Street : Green Traffic Island	203
7	Empson Street : Rain Garden	90
8	Bow School : Pocket Park	116.5
9	Washington Close : Green Wall	85
10	The A12 : Green Subways	82
11	The A12 : Central Noise Barrier	170
12	The A12 : Trees & GI Opportunities	31
	Totals	1168.5

KEY PROGRESS STAGES

	Name	Q1	Q2	Q3	Q4
1	Jolly's Green : Green Wall				
2	Brion Place : Green Graffiti				
3	Lochnagar Street : Community Garden				
4	Teviot Garages : Sound Wall				
5	Lime Quay : Noise Barrier				
6	Gillender Street : Green Traffic Island				
7	Empson Street : Rain Garden				
8	Bow School : Pocket Park				
9	Washington Close : Green Wall				
10	The A12 : Green Subways				
11	The A12 : Central Noise Barrier				
12	The A12 : Trees & GI Opportunities				

JOLLY'S GREEN: GREEN WALL

AREA
8,600 sq.m.

OWNERSHIP
London Borough of Tower Hamlets

LEAD DELIVERY ORGANISATION
LBTH

SUPPORTING ORGANISATIONS
Greening Brownfield

LOCATION

Jolly's Green is located adjacent to the A12 close to its junction with the A13 and the entrance to the Blackwall Tunnel. The open space has a tree-lined edge to the A12 road and its southern boundary is formed by Andrew Street; a vehicular dead-end. The space has no other features and its public use is light and sporadic. Because of its location, Jolly's Green is significantly impacted by noise and air pollution. The space is close to large residential areas which are in the process of being regenerated. It is also part of the Council's 'Green Grid' and is on a key route to a number of local schools.

PROJECT OUTLINE

The first element of this project will be the replacement of the tarmac and paving at the end of Andrew Street with soil, grass and a wildflower meadow. This will be complemented by the installation of a green wall to shield this new green space and Jolly's Green from the air and noise pollution from the A12. The green wall and meadow element of the project will be designed and delivered with the involvement of a local 'green group', Greening Brownfield, who will also take the lead in the long-term maintenance of these projects.

RESEARCH PROPOSAL

The greening of Andrew Street will impact on the biodiversity, noise and air pollution. Baseline monitoring will capture current levels of NO2 and PM10, noise levels and local biodiversity. This research will be repeated at pre-determined intervals once the green wall is in place and grass and wildflower replaces the tarmac of Andrew Street.

COST BREAKDOWN (in £)

Site Investigation and Data	5,000
Site Preparation	11,000
Design Fees	18,000
Installation and Planting	122,000
Project Management	12,000
Monitoring and Reporting	7,000
Contingency	15,000
Total	**190,000**

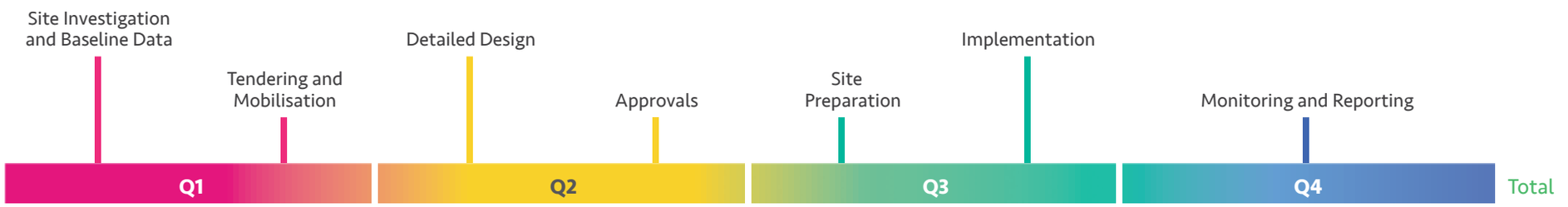
OUTCOMES

- Improved air quality, reduced noise pollution, increased biodiversity
- Increase public use of green

CONSTRAINTS

- Obtaining approvals for removal of part of road space
- Resident concerns regarding removal of unregulated parking
- Obtaining planning permission for the Green Wall

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	18	39	122	11	190
DURATION	3 mths	3 mths	3 mths	1 mth	10 mths

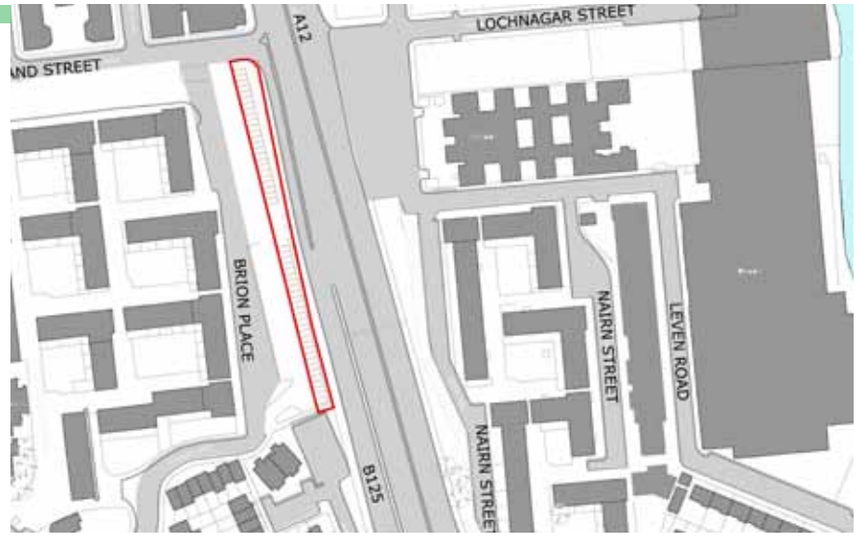
BRION PLACE: GREEN GRAFFITI

AREA
500 metre run of wall

OWNERSHIP
Poplar HARCA

LEAD DELIVERY ORGANISATION
Poplar HARCA

SUPPORTING ORGANISATIONS
Poplar Green Network



LOCATION

There are three significant sections of brick wall that run along the west side of the A12. These walls vary in height from approximatelly 1.5 metres to 3 metres.

Behind each of the walls at Brownfield, Teviot and Bow Bridge are residential estates, each with their own urban growing area and group.

PROJECT OUTLINE

The prominent location of these three sites presents an opportunity to say something about the area in green.
A local artist will be commissioned to work with the three urban growing groups to design their own piece of green graffiti to be grown in moss. Initially, a pilot stretch of wall will be selected of about 150 meters.

RESEARCH PROPOSAL

This site offers the opportunity to compare the impact of a natural green infrastructure barrier with that offered by minimal/no green infrastructure in terms of air quality, noise and temperature. Sensors will be deployed to compare this site, before and after. Additional research will be conducted on the biodiversity of the site and the impact on perceptions of residents behind both of the garages.

COST BREAKDOWN (in £)

Design	1,000
Preparation	2,500
Project Management	500
Monitoring and Reporting	1,000
Total	**5,000**

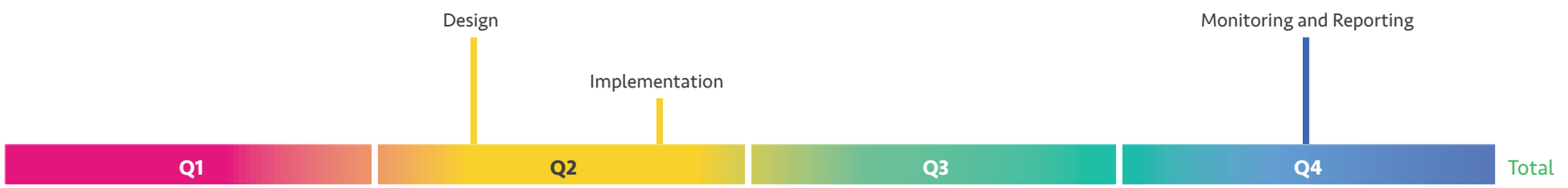
OUTCOMES

- Improved visual and environmental quality
- Improved noise attenuation
- Improved pollution control

CONSTRAINTS

- Additional maintenance regime

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	–	4	–	1	5
DURATION	–	2 mths	–	1 mth	3 mths

Project 3

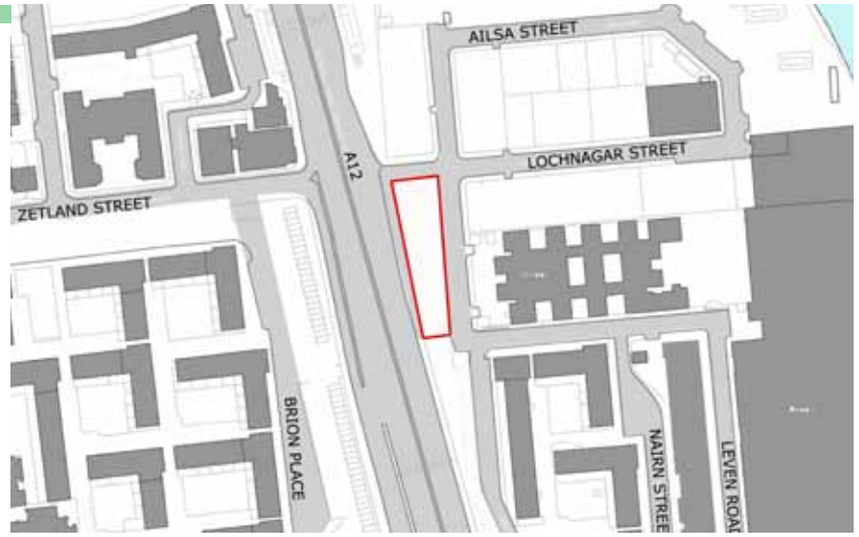
LOCHNAGAR STREET: COMMUNITY GARDEN

AREA
1,200 sq.m.

OWNERSHIP
Poplar HARCA

LEAD DELIVERY ORGANISATION
Poplar HARCA

SUPPORTING ORGANISATIONS
Poplar Green Network



LOCATION

Lochnagar Street lies on the eastern side of the A12 approximatelly 600 metres north of its junction with the A13 East India Dock Road. Immediately to the south of the Lochnagar Street junction, separated from the A12 by a 1.5 metre high brick wall is an area of tree planted open ground.

Behind the Lochnagar Street/A12 interface lies a number of industrial uses that are to be replaced in the medium term by a new mixed use development including commercial uses and housing.

PROJECT OUTLINE

A temporary community garden will be created featuring wildflower planting and a series of gabion walls constructed from a range of materials. This work will include the involvement of a local artist.

The area will also include the installation of bee hives and the garden will be managed by Poplar Green Network as part of their ongoing work in this location.

The garden will soften the current rather harsh environment and begin to establish a sense of place and a focus for a new gateway to a future River Lea crossing and a connection with the Leaway.

COST BREAKDOWN (in £)

Site Investigation	1,000
Site Preparation and Design	8,000
Installation and Planting	23,000
Project Management	7,000
Contingency	3,500
Total	**42,500**

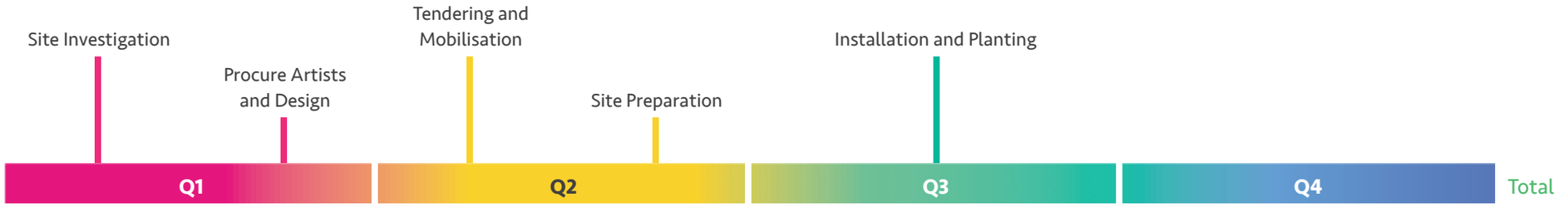
OUTCOMES

- Improved visual and environmental quality of the area
- Improved developer perception of the site

CONSTRAINTS

- Long term management and maintenance

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	6	8	28.5	–	42.5
DURATION	3 mths	3 mths	2 mths	–	8 mths

Project 4

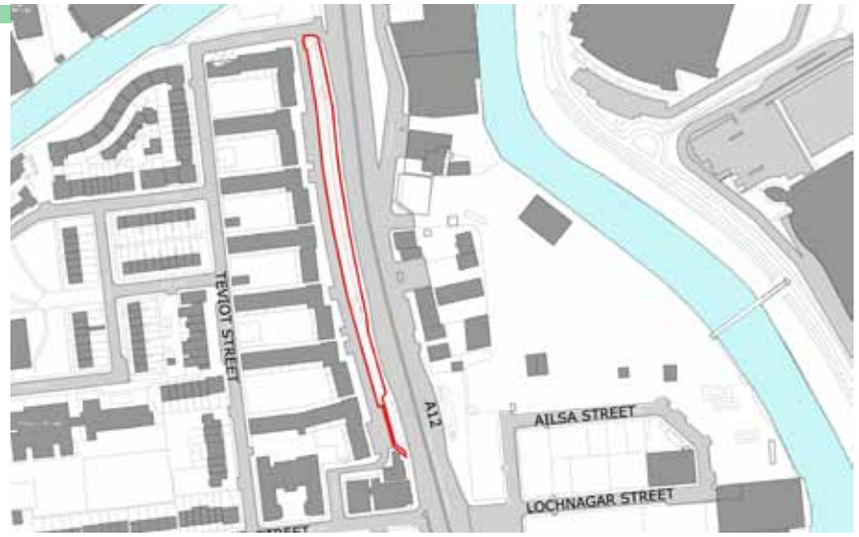
TEVIOT GARAGES

AREA
280 linear metres

OWNERSHIP
Poplar HARCA

LEAD DELIVERY ORGANISATION
Poplar HARCA

SUPPORTING ORGANISATIONS
Poplar Green Network



LOCATION
On the southern section of the A12 adjacent to the Teviot estate is a row of domestic garages that back onto the road and have significant soil substrate on the roofs. Historically, the roof-tops have been allowed to grow 'wild' with very little grounds maintenance.

However, Poplar HARCA have recently pruned back the planting so as to grow back a more structured planting scheme including woodland whips, silver birch, wayfaring tree, guilder rose and spindle bush so that it is more asthetically pleasing as well as a noise and air pollution barrier.

PROJECT OUTLINE
The 1.5 to 3 metre high brick walls that act as both retaining structures and the rear walls of the garages are a monotonous and hard edge to the A12 which also reflects traffic noise. The project along this stretch of road will involve additional planting on the garage roof-tops together with ivy and other trailing plants introduced within a frame affixed to the brick wall. This frame will incorporate a noise absorbency core to prevent reflected noise and to reduce noise generally from the A12.

RESEARCH PROPOSAL
This site offers the opportunity to compare the impact of a natural green infrastructure barrier with that offered by minimal/no green infrastructure in terms of air quality, noise and temperature. Sensors will be deployed to compare this site, before and after. Additional research will be conducted on the biodiversity of the site and the impact on perceptions of residents.

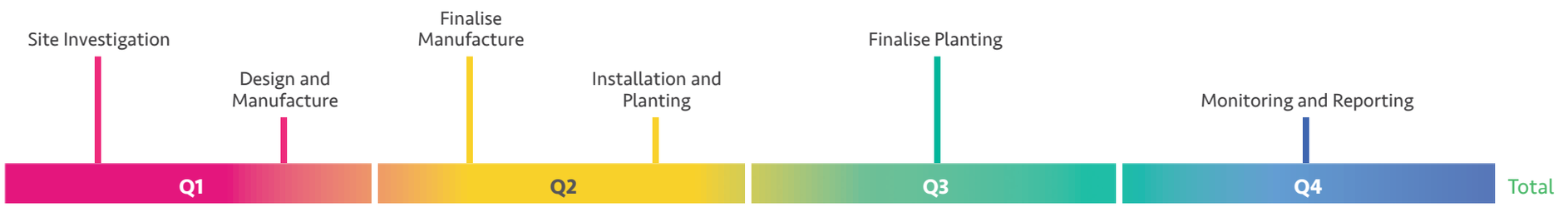
COST BREAKDOWN (in £)

Site Investigation	1,500
Design and Manufacture	57,000
Installation and Planting	30,000
Project Management	15,000
Monitoring and Reporting	10,000
Contingency	5,000
Total	**118,500**

OUTCOMES
- Improved visual and environmental quality
- Improved noise attenuation
- Improved pollution control

CONSTRAINTS
- Additional maintenance regime

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	56.5	47	5	10	118.5
DURATION	3 mths	3 mths	1 mth	1 mth	8 mths

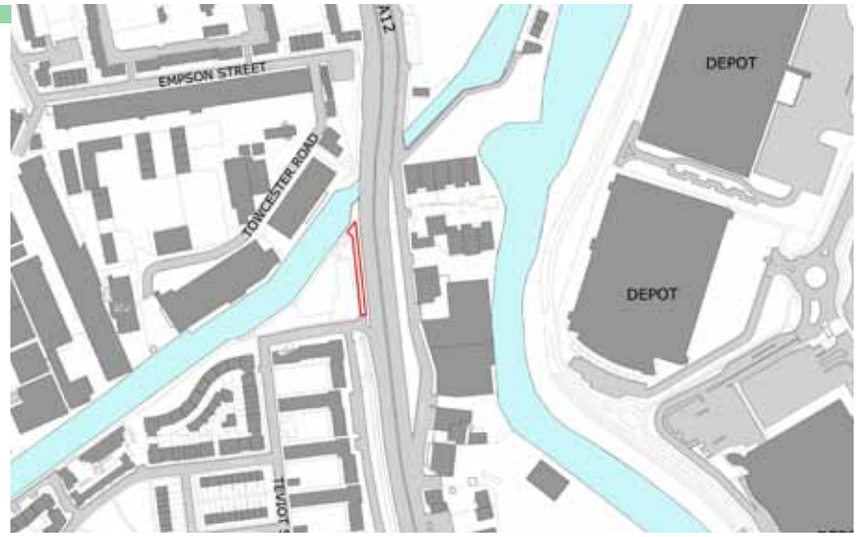
LIME QUAY: NOISE BARRIER

AREA
70 linear metres

OWNERSHIP
Poplar HARCA

LEAD DELIVERY ORGANISATION
Poplar HARCA

SUPPORTING ORGANISATIONS
Poplar Green Network



LOCATION

On the west side of the A12 at the junction with the Limehouse Cut, Telford Homes Plc have developed a new apartment block called Lime Quay.

Between the edge of the development and the back of pavement is a narrow strip of land that forms an access to the ground floor of the final development.

PROJECT OUTLINE

Telford Homes Plc has provided tree planting along their frontage with the A12. Poplar HARCA is in discussions with Telford Homes Plc about how this planting can be designed in such a way so as to maximise noise and air pollution mitigation.

There is the opportunity to insert a series of temporary green walls between the existing planters. These 'louvered' green walls will comprise an artificial hedge or real ivy inside of which will be inserted noise absorbent material. The different materials will then be tested for their efficiency.

RESEARCH PROPOSAL

Measurements of the noise from the second floor of the original building prior to its redevelopment were undertaken as part of the planning application.

Whilst the insulation and ventilation in Lime Quay will mean that residents will not be impacted by air pollution, high levels will remain at street level.

Research will explore how the different configurations of green wall impact on noise at the ground and first floor levels.

COST BREAKDOWN (in £)

Site Investigation and Data	500
Site Preparation	2,500
Design and Construction	20,000
Installation	4,000
Project Management	3,000
Monitoring and Reporting	2,000
Contingency	3,000
Total	**35,000**

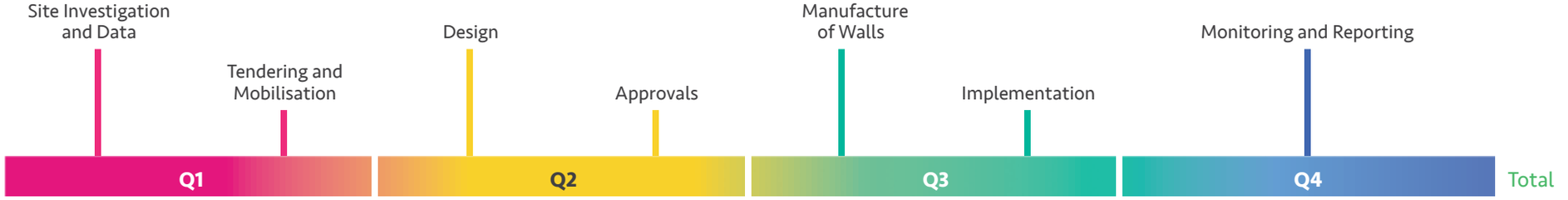
OUTCOMES

- Evidence into noise mitigating properties of green walls
- Reduction of noise at ground floor level for occupants and pedestrians
- Improvement to the environment adjacent to the new development

CONSTRAINTS

- Need for detailed sensor array to pick up variations between green wall approaches
- Design of wall to allow views into the site

WORK PROGRAMME AND MILESTONES



FINANCIAL PROFILE (in £k)	5	10	17	3	35
DURATION	3 mths	2 mths	3 mths	2 mths	10 mths

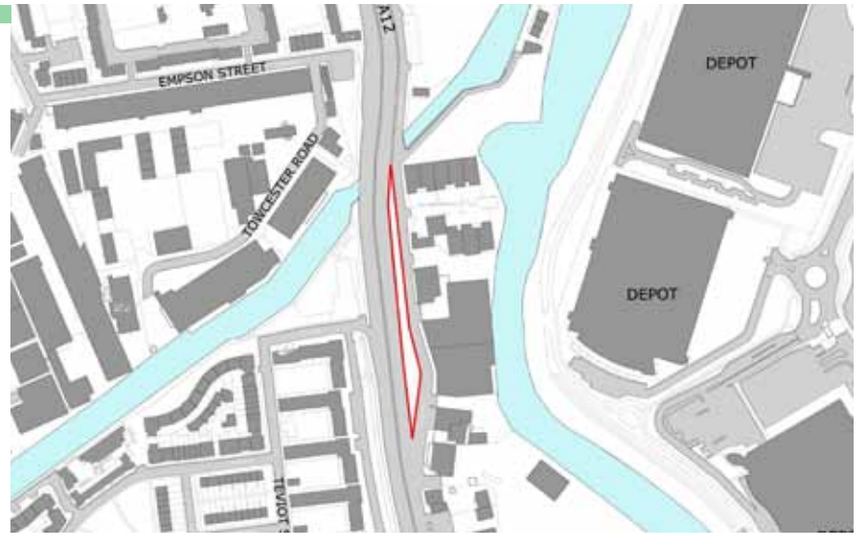
GILLENDER STREET: GREEN TRAFFIC ISLAND

AREA
1,350 sq.m.

OWNERSHIP
Transport for London

LEAD DELIVERY ORGANISATION
Transport for London

SUPPORTING ORGANISATIONS
Poplar HARCA



LOCATION

On the east side of the A12 opposite the Lime Quay development is a traffic island formed by the Gillender Street slip road off of the A12. The traffic island runs for some 230 metres and currently has a number of trees along its length, planted in narrow (~1m2) pits at ~10m intervals. The remainder of the traffic island is covered in concrete slabs.

PROJECT OUTLINE

This project will break out the narrow tree pits to allow additional tree planting and native woodland ground flora that will attenuate water, as well as being low maintenance and shallow rooted (so as not to interfere with underground utilities).

'Stockholm Tree Pits' will divert water from the A12 into the island to water the trees.

There will also be the opportunity to insert a series of green noise baffles to improve sound attenuation and air quality along this part of the route.

RESEARCH PROPOSAL

Baseline research will measure the surface water run-off from the island together with the extent of pollutants in that water. After the implementation of the Stockholm tree pits, water run-off and pollution will be compared with the baseline.

COST BREAKDOWN (in £)

Site Investigation	5,000
Site Preparation	3,000
Design	15,000
Installation and Planting	125,000
Project Management	28,000
Monitoring and Reporting	12,000
Contingency	15,000
Total	**203,000**

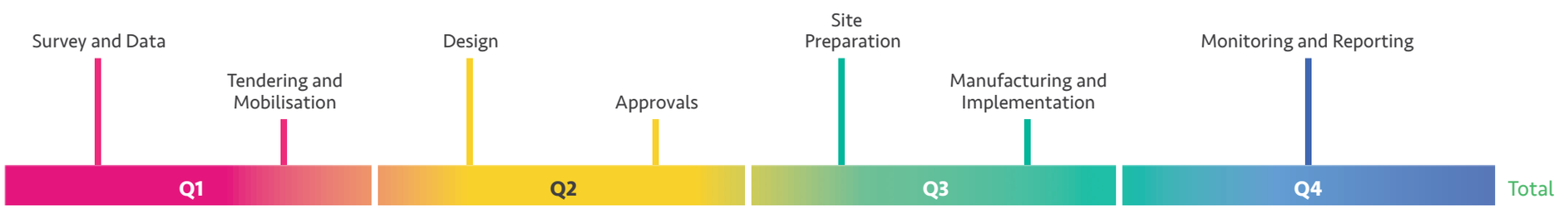
OUTCOMES

- Reduced puddling/ localised flooding
- Improve air quality through additional planting
- Reduce traffic noise
- Enhance the entrance to the Bow Locks and access to the Lea Way
- Improved visual quality of the road

CONSTRAINTS

- Location of utilities infrastructure
- Lane closures required to deliver work

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	15	25	148	15	203
DURATION	3 mths	3 mths	3 mths	3 mths	12 mths

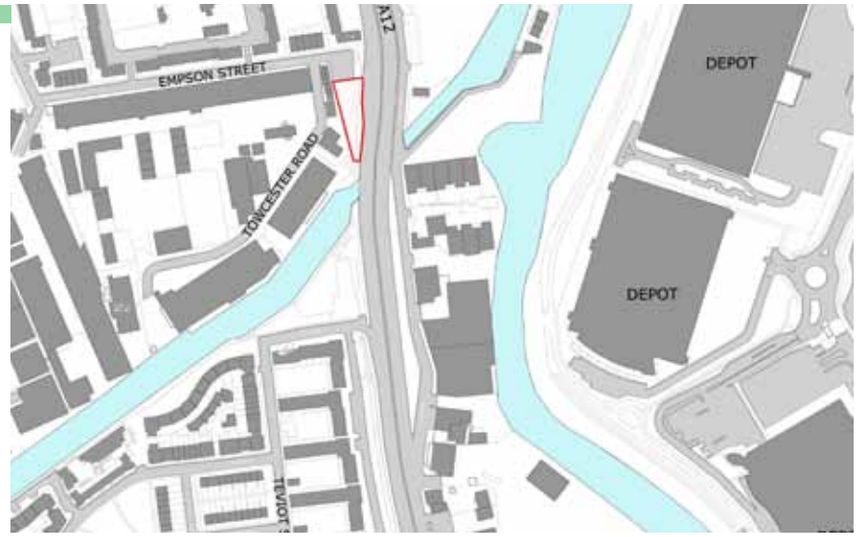
EMPSON STREET: RAIN GARDEN

AREA
1,200 sq.m.

OWNERSHIP
Transport for London

LEAD DELIVERY ORGANISATION
Transport for London

SUPPORTING ORGANISATIONS
Poplar Green Network



LOCATION

Set back from the A12 road and behind the entrance to the Empson Street subway on the west side of the A12 is an open area of paving and a number of semi-mature trees that provide cooling and air pollution mitigation.

The site is close to a bus stop and is the main subway entrance to the new Bow School. A brick wall marks the boundary of the space separating it from a strategic industrial site where one of the main occupants is a cement batching plant.

PROJECT OUTLINE

To build on the natural environment provided by the mature trees, the area adjacent to the boundary wall will be broken out and a new 'rain garden' and green wall will be introduced to soften the current rather harsh environment and to begin to establish a sense of place.

There is also the potential for public art to be incorporated within the scheme. Maintenance of the scheme will be supported by members of the local growing group.

RESEARCH PROPOSAL

Given the location of the rain garden adjacent to a subway that will connect to the Bow School and its broader importance to connecting Poplar to the Leaway, research will investigate the extent to which the rain garden improves footfall to the area and across the A12.

COST BREAKDOWN (in £)

Site Investigation	1,000
Site Preparation and Design	12,000
Installation and Planting	50,000
Project Management	12,000
Monitoring and Reporting	5,000
Contingency	10,000
Total	**90,000**

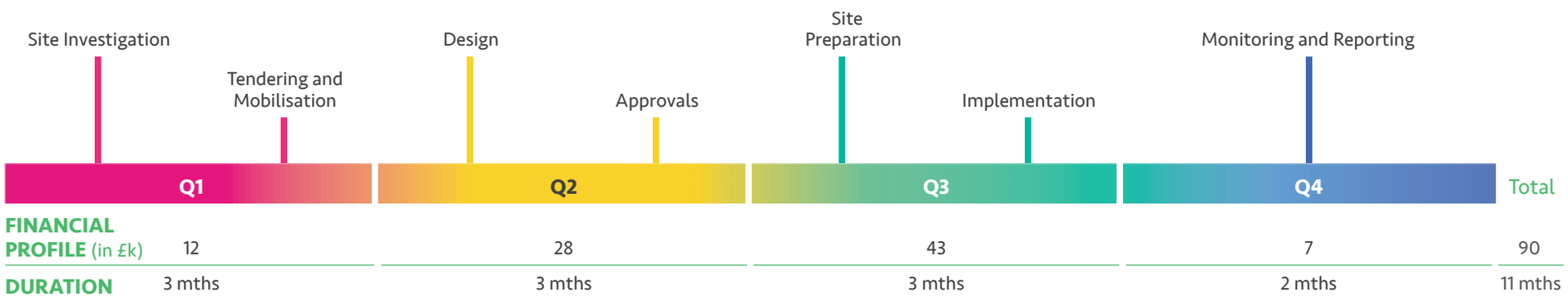
OUTCOMES

- Improved water attenuation
- Improved visual and environmental quality
- Improved noise and pollution attenuation

CONSTRAINTS

- Location of utilities
- Design will need to ensure there is still good sight lines to and from the subway entrance

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	12	28	43	7	90
DURATION	3 mths	3 mths	3 mths	2 mths	11 mths

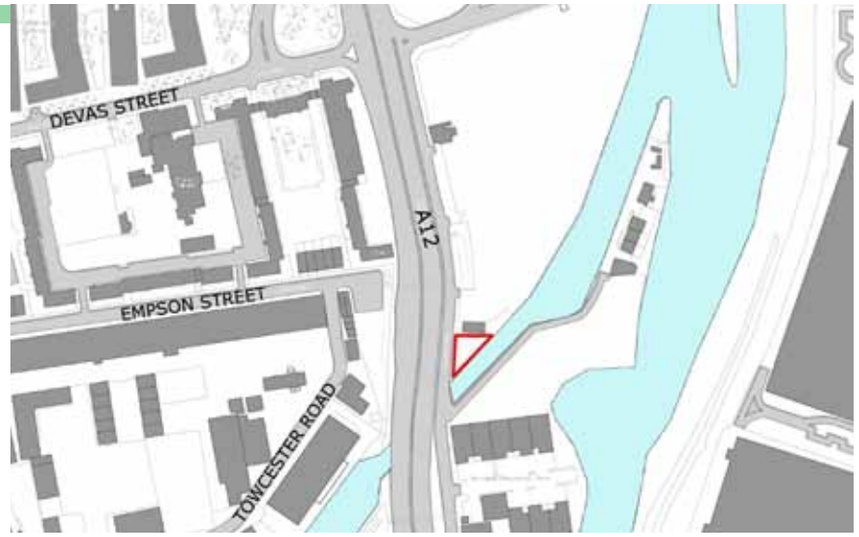
BOW SCHOOL: POCKET PARK

AREA
220 sq.m.

OWNERSHIP
London Borough of Tower Hamlets

LEAD DELIVERY ORGANISATION
London Borough of Tower Hamlets

SUPPORTING ORGANISATIONS
Local Education Authority; Bow School



LOCATION
The new Bow School is located on the eastern side of the A12 at its junction with Twelvetrees Crescent. Adjacent to the school's southern boundary is a small open space abutting with the river wall to the Limehouse Cut.

PROJECT OUTLINE
Giving greater access to students and the local community to the nearby Leaway is a major priority for the Council and Poplar HARCA. This project will introduce a new pocket park adjacent to the Limehouse Cut which is intended to form the beginning of a route to enhance safe access to the Leaway.

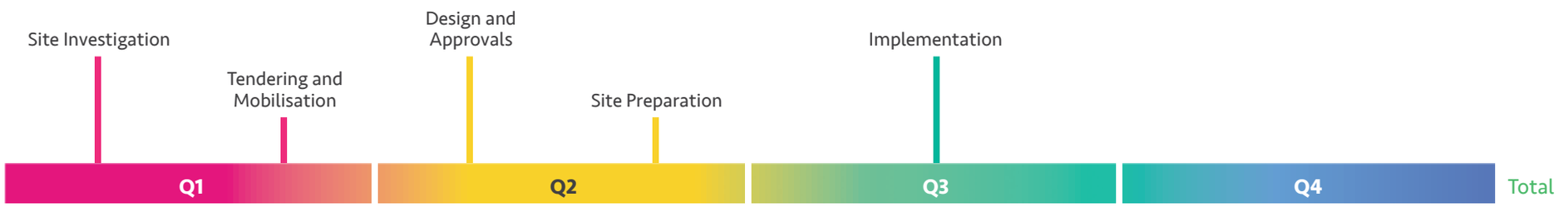
OUTCOMES
— Creation of a new green open space

CONSTRAINTS
— Unrestricted access adjacent to school

COST BREAKDOWN (in £)

Site Investigation	3,500
Site Preparation and Design	20,000
Installation and Planting	68,000
Project Management	15,000
Contingency	10,000
Total	**116,500**

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	12	31.5	73	—	116.5
DURATION	3 mths	3 mths	2 mths	—	8 mths

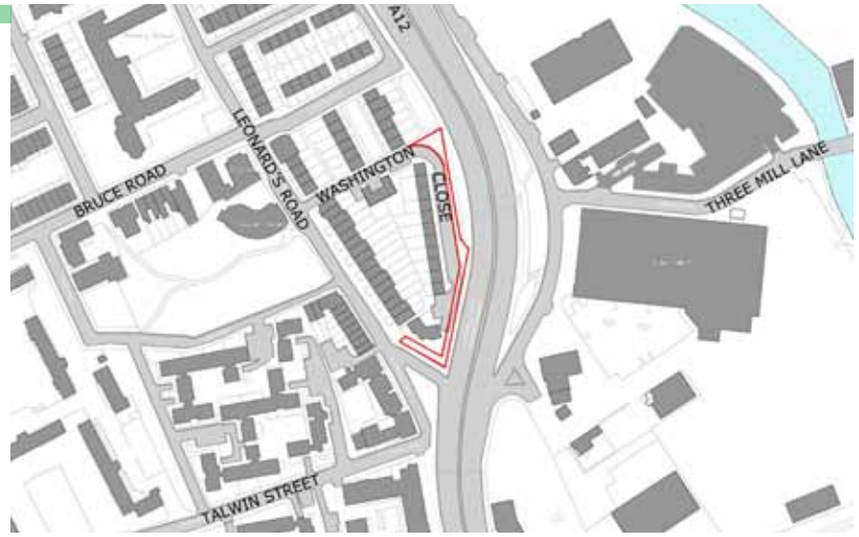
WASHINGTON CLOSE: GREEN WALL

AREA
150 linear metres

OWNERSHIP
Pavement area — Transport for London;
Wall — Poplar HARCA

LEAD DELIVERY ORGANISATION
Poplar HARCA

SUPPORTING ORGANISATIONS
Poplar Green Network



LOCATION

This project is focused on a small patch of 'dead space' between a subway and a 'zig-zag' noise wall protecting Washington Close, a residential neighbourhood. The subway is a key crossing point for Bow School and to the Tesco's supermarket.

PROJECT OUTLINE

Planters made from reclaimed rail sleepers will be made to fit each of the inlets in the Washington Close noise wall. Climbing species such as native ivy (Hedera Helix), honeysuckle (Lonicera Periclymenum) and old man's beard (Clematis Vitalba) will be planted in the sleepers to cover this section of the wall to further dampen the noise generated by the A12.

RESEARCH PROPOSAL

This site offers the opportunity to compare the impact of a natural green infrastructure barrier with that offered by minimal/no green infrastructure in terms of air quality, noise and temperature. Sensors will be deployed to compare this site, before and after. Additional research will be conducted on the biodiversity of the site and the impact on perceptions of residents.

COST BREAKDOWN (in £)

Site Investigation	1,500
Site Preparation and Design	4,500
Installation and Planting	53,000
Project Management	12,000
Monitoring and Reporting	6,000
Contingency	8,000
Total	**85,000**

OUTCOMES

- Improved visual and environmental quality of the area
- Improved noise attenuation and pollution control

CONSTRAINTS

- Additional maintenance regime to be carried out close to the edge of the A12

WORK PROGRAMME AND MILESTONES

	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	10	19	47	9	85
DURATION	3 mths	3 mths	2 mths	1 mth	9 mths

THE A12: GREEN SUBWAYS

AREA
N/A

OWNERSHIP
Transport for London

LEAD DELIVERY ORGANISATION
Transport for London

SUPPORTING ORGANISATIONS
Poplar Green Network

LOCATION

There are 6 subways on the stretch of the A12 from Bow Roundabout to the junction with the A13, while there is only one street level crossing (at the southern end, near Lochnegar Street). Whilst there are ambitions to provide additional street level crossings to the north, these subways will continue to be vital strategic connections from Poplar to the new housing developments and the Leaway.

PROJECT OUTLINE

A short term temporary project will be the installation of a number of vigorous climbing plants (including edible ones such as French beans, gourds and climbing courgettes) along the railings of one of the subways.

The western retaining wall of some of the subway should receive sufficient daylight to allow growing of plants down it. This planting will be maintained by the nearest urban growing group.

A medium term intervention will be the integration of an engineered vertical rain garden in one of the subways. This would reduce water run off onto the road and into the subway (where there is drainage associated with the subways, the grates are often blocked by leaves, moss and litter).

These projects are a precursor to more innovative and permanent projects to enhance the environment of the subways that will be scoped by a design competition.

COST BREAKDOWN (in £)

Site Investigation	3,000
Site Preparation and Design	12,000
Installation and Planting	55,000
Project Management	7,000
Contingency	5,000
Total	**82,000**

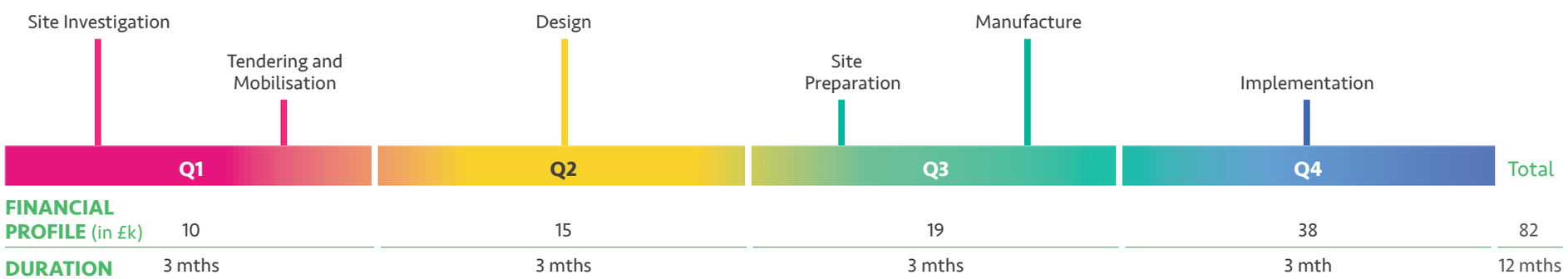
OUTCOMES

- Improved visual and environmental quality of the area
- Improved noise attenuation and pollution control

CONSTRAINTS

- Additional maintenance regime

WORK PROGRAMME AND MILESTONES



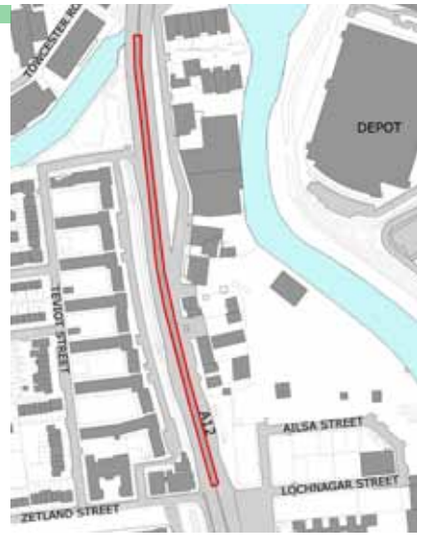
THE A12: CENTRAL NOISE BARRIER

AREA
350 linear metres

OWNERSHIP
Transport for London

LEAD DELIVERY ORGANISATION
Transport for London

SUPPORTING ORGANISATIONS
Poplar HARCA; London Borough of Tower Hamlets



LOCATION
The project will be focussed on the central barrier of the A12, separating the north and southbound junctions.

The length of the barrier to be treated is 350 metres and runs from the Limehouse Cut to Lochnagar Street/Zetland Road.

PROJECT OUTLINE
The 1.5 to 2.0 metre high concrete barrier and metal railings of the central reservation of the A12 road will be clad with an artificial green hedge or a solid infil panel which will incorporate a noise absorbency core to prevent reflected noise and to reduce noise generally from the A12.

The design of the noise barrier will also provide a platform for public art.

RESEARCH PROPOSAL
The project offers the opportunity to compare the impact of an acoustic barrier in terms of air quality, noise and temperature. Sensors will be deployed to compare this site, before and after. Additional research will be conducted to investigate the perceptions of drivers and local residents.

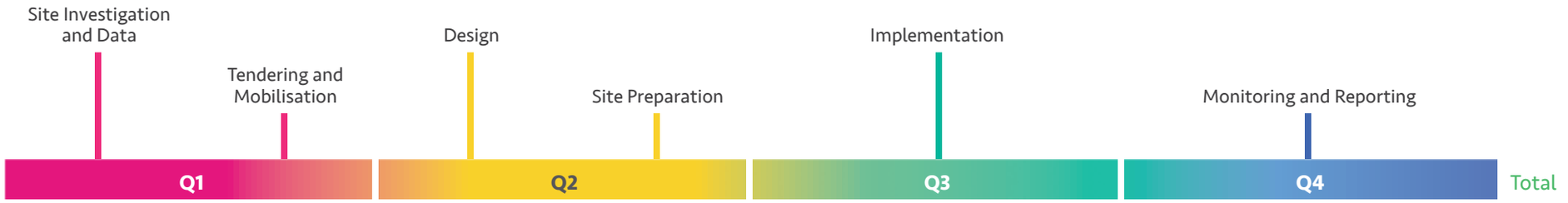
COST BREAKDOWN (in £)

Site Investigation and Data	5,000
Design and Manufacture	75,000
Installation	45,000
Project Management	20,000
Monitoring and Reporting	10,000
Contingency	15,000
Total	**170,000**

OUTCOMES
- Improved visual and environmental quality of the area
- Improved noise attenuation

CONSTRAINTS
- Additional maintenance regime to be carried out on the edge of the A12

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	15	80	62	13	170
DURATION	3 mths	3 mths	2 mths	2 mths	10 mths

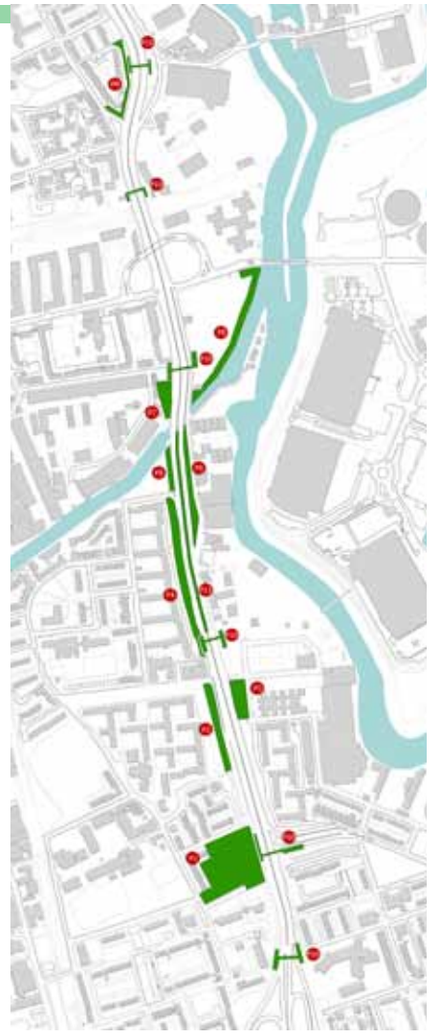
THE A12: TREE AND GI OPPORTUNITY SURVEY

AREA
N/A

OWNERSHIP
Transport for London; London Borough of Tower Hamlets; Poplar HARCA

LEAD DELIVERY ORGANISATION
Poplar HARCA/ London Borough of Tower Hamlets/ Transport for London

SUPPORTING ORGANISATIONS
Poplar Green Network



LOCATION
Opportunities for additional planting to be introduced along the A12 exist in various locations both on the pavement and traffic islands managed by Transport for London but also adjacent land managed by Poplar HARCA and the London Borough of Tower Hamlets.

PROJECT OUTLINE
Certain trees and other 'green' infrastructure (e.g. hedges, green walls) could reduce noise (or could provide the means to contain additional acoustic insulation) and might also reduce levels of air pollution. In tandem with the surveying of existing trees, areas of deficiency in tree cover will be mapped and checked against known utilities and other constraints (traffic sight lines, etc.) to identify priority areas for more detailed assessments and surveys for tree planting. In addition, other opportunities for introduction of air and noise attenuation measures will be identified and mapped.

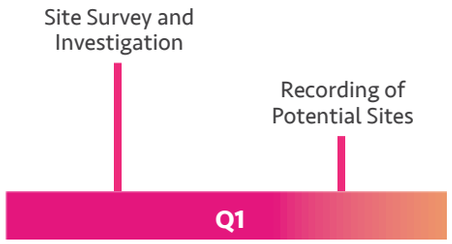
COST BREAKDOWN (in £)

Site Investigation	15,000
Design	8,000
Project Management	5,000
Contingency	3,000
Total	**31,000**

OUTCOMES
- Improved visual and environmental quality of the area
- Improved noise attenuation and pollution control

CONSTRAINTS
- Additional maintenance regime to be carried out on the edge of the A12

WORK PROGRAMME AND MILESTONES



	Q1	Q2	Q3	Q4	Total
FINANCIAL PROFILE (in £k)	31	–	–	–	31
DURATION	3 mths	–	–	–	3 mths

ALIGNMENT WITH THE POLICY, GUIDANCE AND PRIORITIES

NATIONAL PLANNING POLICY FRAMEWORK

The planning system should contribute to and enhance the natural and local environment by:

- recognising the wider benefits of ecosystem services;
- minimising impacts on biodiversity and providing net gains in biodiversity where possible; and
- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land.

Local planning authorities should:

- set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.

Planning policies and decisions should aim to:

- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions.

LONDON PLAN

Policy 5.9 Overheating and Cooling

The Mayor seeks to reduce the impact of the urban heat island effect in London and encourages the design of places and spaces to avoid overheating and excessive heat generation, and to reduce overheating due to the impacts of climate change and the urban heat island effect on an area wide basis.

Policy 5.10 Urban Greening

A: The Mayor will promote and support urban greening, such as new planting in the public realm (including streets, squares and plazas) and multifunctional green infrastructure, to contribute to the adaptation to, and reduction of, the effects of climate change.

C: Development proposals should integrate green infrastructure from the beginning of the design process to contribute to urban greening, including the public realm. Elements that can contribute to this include tree planting, green roofs and walls, and soft landscaping. Major development proposals within the Central. Activities Zone should demonstrate how green infrastructure has been incorporated.

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TOWER HAMLETS LOCAL PLAN

The Council's Core Strategy specifically identifies the need to address the impact of noise and air pollution in the borough by minimising and mitigating the impact of noise in identified hot spots, such as along main vehicular routes. The same policy also requires measures to manage and improve air quality along transport corridors and traffic-congestion points by working with Transport for London.
The Core Strategy highlights that air and noise pollution have negative impacts on health and well-being. The Council seeks to address air pollution resulting from vehicle emissions and other polluting land-uses to reduce the incidence of chronic lung diseases and heart conditions. Addressing noise pollution, meanwhile, will help to alleviate hearing impairments, sleep disturbance and negative psychophysiological effects. Policy SO12 seeks to create a high-quality, well-connected and sustainable natural environment of green and blue spaces that are rich in biodiversity and promote active and healthy lifestyles. Policy SO13 looks to introduce measures to reduce the risk and impact of flooding on people, property and the environment.

Policy SP04 highlights that publicly accessible open spaces serve as multi-functional spaces that cater for a range of activities, lifestyles, ages and needs. Improving access to the strategically important publicly accessible open spaces, which currently include, amongst others, the Lea River Park and the Leaway. The policy also states that it will promote and support new development that provides green roofs, green terraces and other measures to green the built environment and protect and enhance biodiversity value and reduce the risk and impact of flooding.

Tower Hamlets SUDS Guidance

In response to the Flood and Water Management Act 2010, Tower Hamlets Local Authority has produced a Surface Water Management Plan to describe the issues of surface water flooding in the Borough and how it will manage this. The plan includes the mapping of Local Flood Risk Zones and a requirement for developments across the Borough, including retrofitting opportunities during refurbishment projects, to include Sustainable Urban Drainage System (SUDS) measures to improve water quantity or quality discharging to sewer networks.

As part of this process, the University of East London have been working in partnership with the London Borough of Tower Hamlets to develop SUDS guidance appropriate for high density urban areas. Recently published (June 2014), the guidance is designed to recognise the multifunctionality of green infrastructure components within the SUDS management train and seeks to maximise ecosystem service provision through promoting design for biodiversity. The Tower Hamlets SUDS guidance encourages a novel approach to managing urban stormwater and the Green Mile programme represents an ideal platform on which to showcase these innovative approaches and quantify their added value for communities and transport infrastructure in terms of ecosystem services.