CRP'S LUNCHTIME LAUNCHES

CROSS RIVER PARTNERSHIP
Delivering London's Future Together

Climate Effects:
The Benefits of Greening

Thursday 30th September
1:15pm – 2pm

Bloomberg Associates

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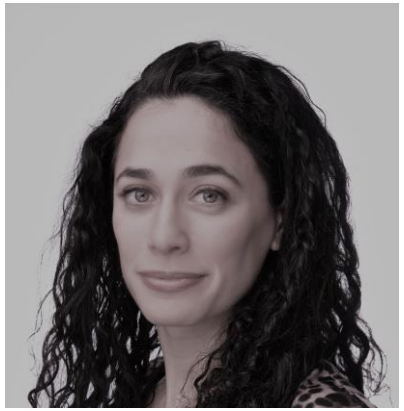
Delivering London's Future Together

Department for Environment Food & Rural Affairs

Today's Speakers



Lauren Racusin
Urban Planning, Sustainability, and Economic Development
Bloomberg Associates
Speaker

Ben Connor
Senior Policy and Programmes Officer
Greater London Authority

Speaker

Fiona Coull
Project Manager
Cross River Partnership

Speaker

Rachael Aldridge
Communications Project Manager
Cross River Partnership

Chair

Isidora Rivera Vollmer
Project Officer
Cross River Partnership

Chat Moderator

Today's Agenda

1. Cross River Partnership (CRP) Introduction

2. Bloomberg Associates - Following the Data: Leveraging London's Climate Risk Mapping to Address Climate Vulnerability

3. Greater London Authority – Green Infrastructure and Climate Adaptation

4. CRP's Healthy Streets Everyday programme – "Greening Out the Grey": The Value of Green Infrastructure for People and Places

Please pose your questions and thoughts throughout this session in the chat box to the right

Introduction and Context

Rachael Aldridge

Cross River Partnership

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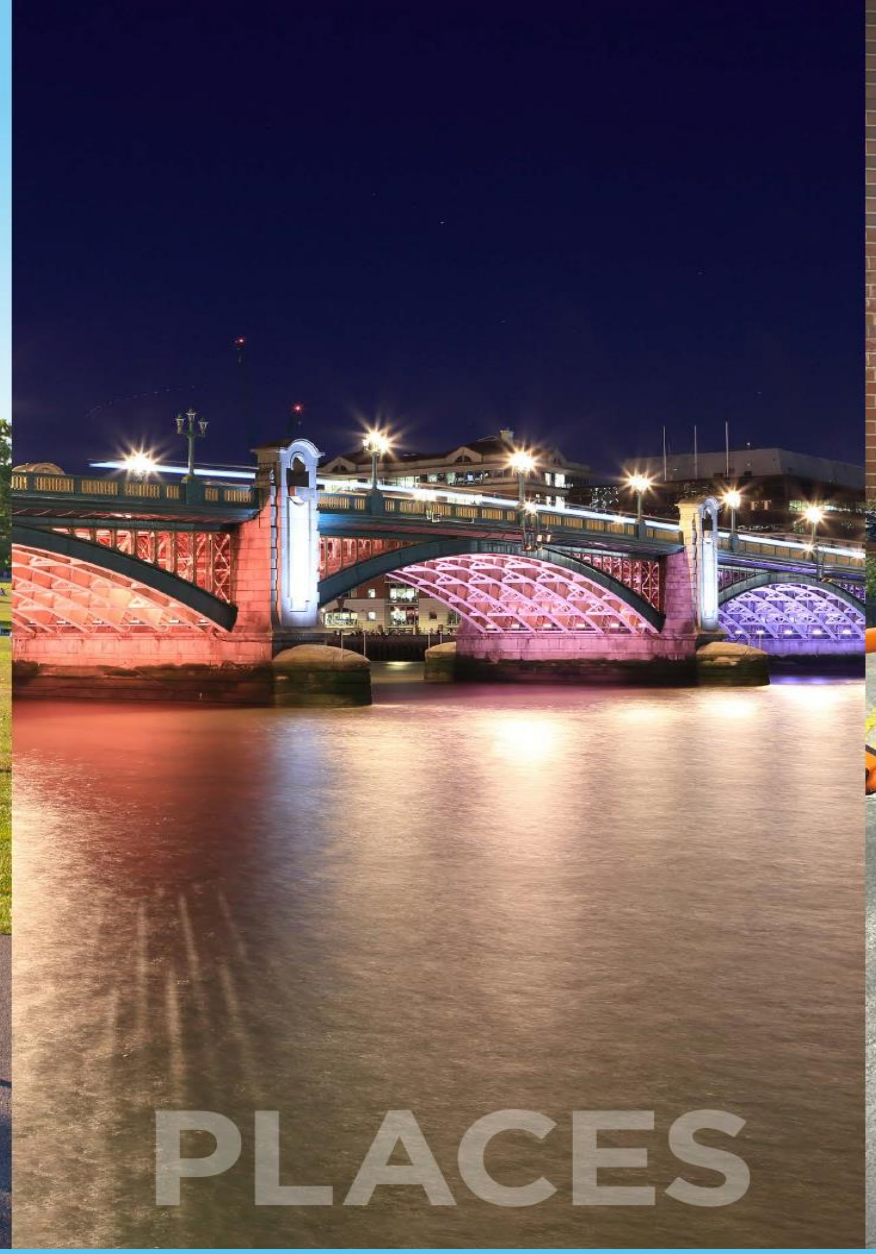
Delivering London's Future Together

Annual Report 2020-2021

Business Plan 2021-2022

PEOPLE



PLACES

PROJECTS

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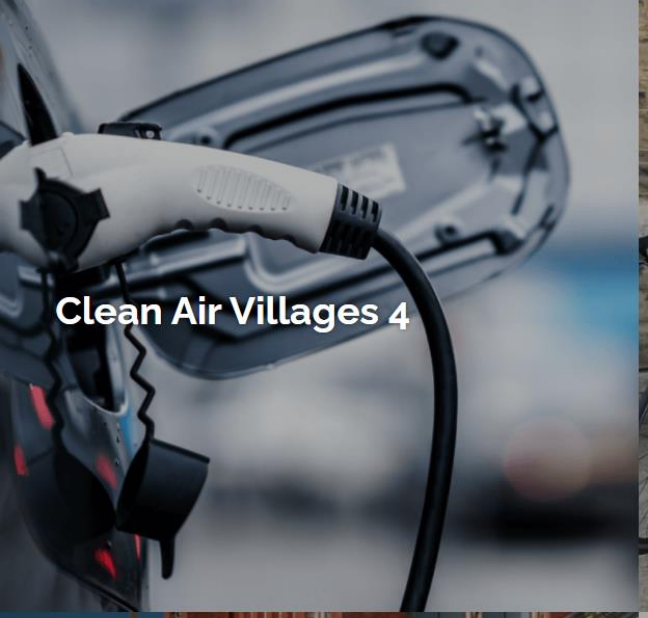

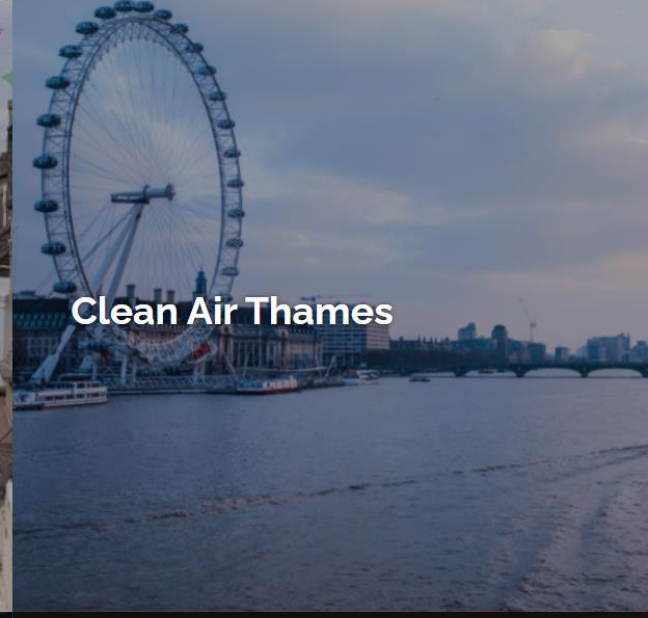

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03 Partners

Cross River Partnership is proud to be working collaboratively with all of these public, private and community partners across central London and beyond.

1. Angel London
2. Better Bankside
3. Brixton BID
4. Cadogan
5. Camden Town Unlimited
6. Cheapside Business Alliance
7. Euston Town BID
8. Hammersmith BID
9. Hatton Garden BID
10. Marble Arch BID
11. Central District Alliance
12. Paddintgon Now
13. South Bank BID
14. Team London Bridge
15. The Fitzrovia Partnership
16. The Northbank BID
17. Vauxhall One
18. Victoria BID

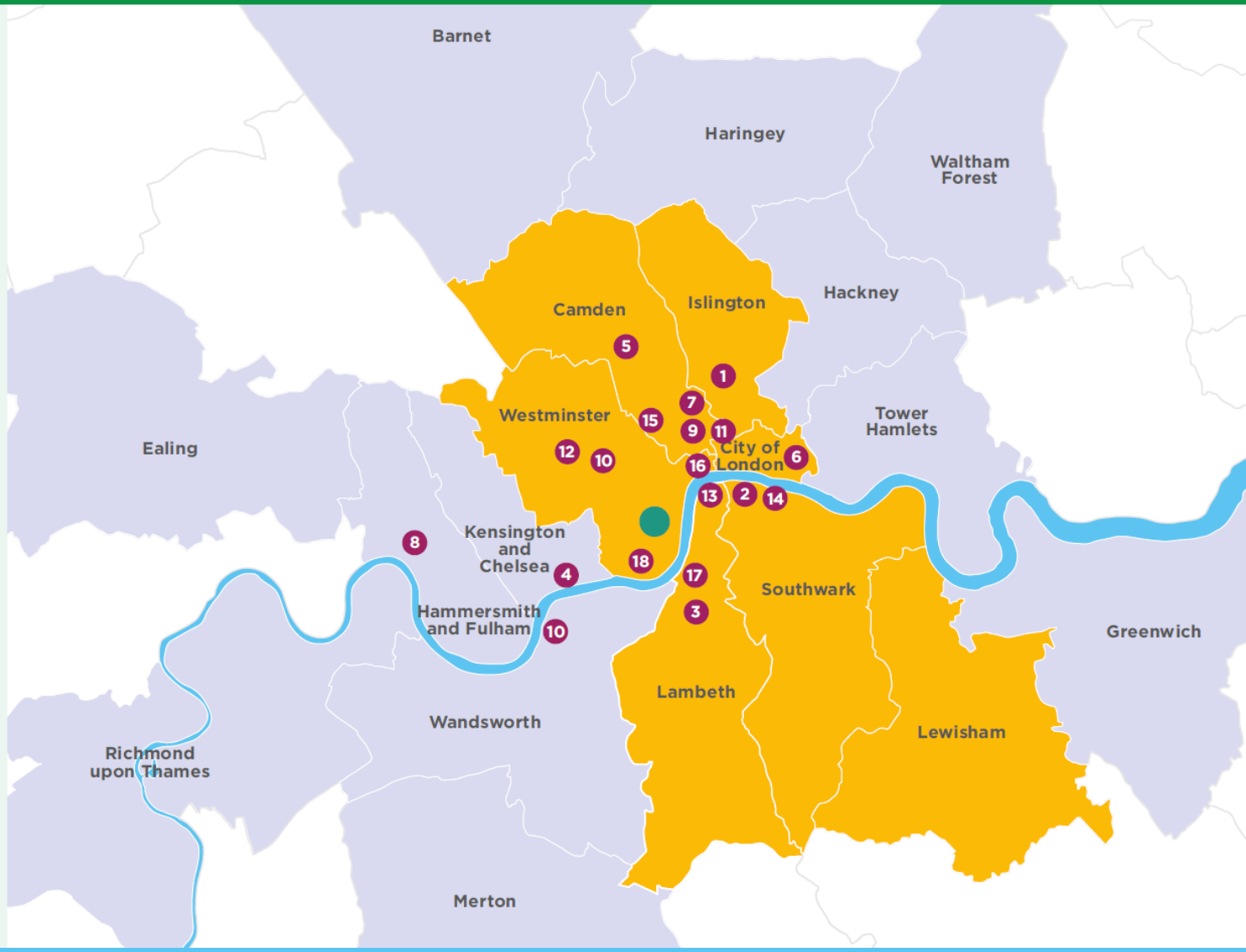
CRP Board Boroughs

Boroughs CRP works with

CRP Lead Accountable Body: Westminster City Council

CRP Strategic Partners:

- Greater London Authority
- Groundwork London
- London and Partners
- Network Rail
- Port of London Authority
- Transport for London



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Following the Data: Leveraging London's Climate Risk Mapping to Address Climate Vulnerability

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looding, as seen here in Richmond in 2009, is predicted to become more common as the century progresses ©Iridescent/Wikimedia Commons

NEWS

Extreme heat and flooding risk in London due to climate change

By James Ashworth
First published 23 September 2021

Thousands of homes, schools and hospitals in London are a
change, the Mayor of London has said.

A new analysis suggests that areas such as Vauxhall, Earls
are at high risk of floods, while Peckham, Limehouse and Sh

Environment ▶ **Climate crisis** Wildlife Energy Pollution Green light

London

Climate crisis: fifth of London schools now susceptible to flooding

Sadiq Khan to warn time is running out to tackle emergency as he puts pressure on UK government to act

Aubrey Allegretti *Political correspondent*
@breeallegretti
Wed 22 Sep 2021 19.01 EDT

eener, fairer and more prosperous for everyone', the mayor is to say.
Rex/Shutterstock

e now susceptible to flooding and millions of
e at "high risk" of suffering from the effects of
o analysis from City Hall, as Sadiq Khan warns
he issue.

London mayor is due to pile pressure on the UK
tion is taken when it hosts world leaders for
ıths' time, and add that without a significant

The Telegraph News Business Sport Opinion Politics World Money Life Style Travel Culture

UK news Coronavirus Royals Health Defence Science Education Environment Investigations Global Health Security

Climate change could leave quarter of London stations at risk of flooding

Sadiq Khan, the capital's Mayor, warns of 'catastrophic' effects that floods and overheating could have on city

By Olivia Rudgard, ENVIRONMENT CORRESPONDENT
23 September 2021 • 8:00am

Related Topics
Sadiq Khan, Climate change, City of London, Flooding, Tube (London Underground)

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To help the GLA target its resources to communities with the highest climate risks, Bloomberg Associates produced a series of citywide maps overlaying key metrics to identify areas within London that are most exposed to climate impacts with high concentrations of vulnerable populations.

Climate Risk Metrics

We reviewed several risk indices and evaluated more than 30 metrics to understand the factors that are driving Londoners' exposure and vulnerability to climate risks and developed a set of 12 prioritized metrics for initial analyses.

EXPOSURE METRICS

- Heat Risk Index (Land Surface Temperature)
- Surface Water Flood Risk*
- Air Pollution (PM2.5 Concentration and NO2 Concentration)
- Green/Blue Land Cover (%)
- Tree Canopy Cover (%)
- Areas of Deficiency in Access to Public Open Space*

VULNERABILITY METRICS

- Vulnerable Age Groups (% population <5 and >75)
- English Proficiency (%)
- Income Deprivation (%)*
- Social Renters (%)

*See Appendix for detailed information on chosen metrics.

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Climate Risk Mapping: Methodology

1. Gathered data

- Used both publicly available and privately licensed data
- Secured smallest-scale, most up-to-date datasets
- Needed datasets to span all of Greater London

2. Prepared input layers

- Converted each metric into an input layer used in three final overlap maps
- Converted data to hex grid geography, used by GLA

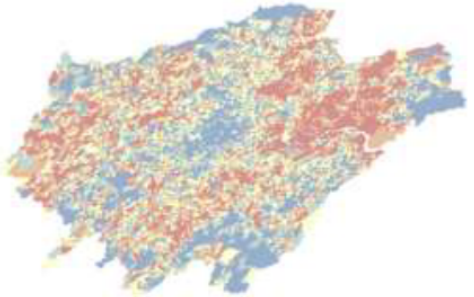
3. Produced overlay map

- Used GIS tools to create series of overlay maps
- Highlighted hexes with greatest levels of climate risk

Exposure Metrics

+

Vulnerability Metrics



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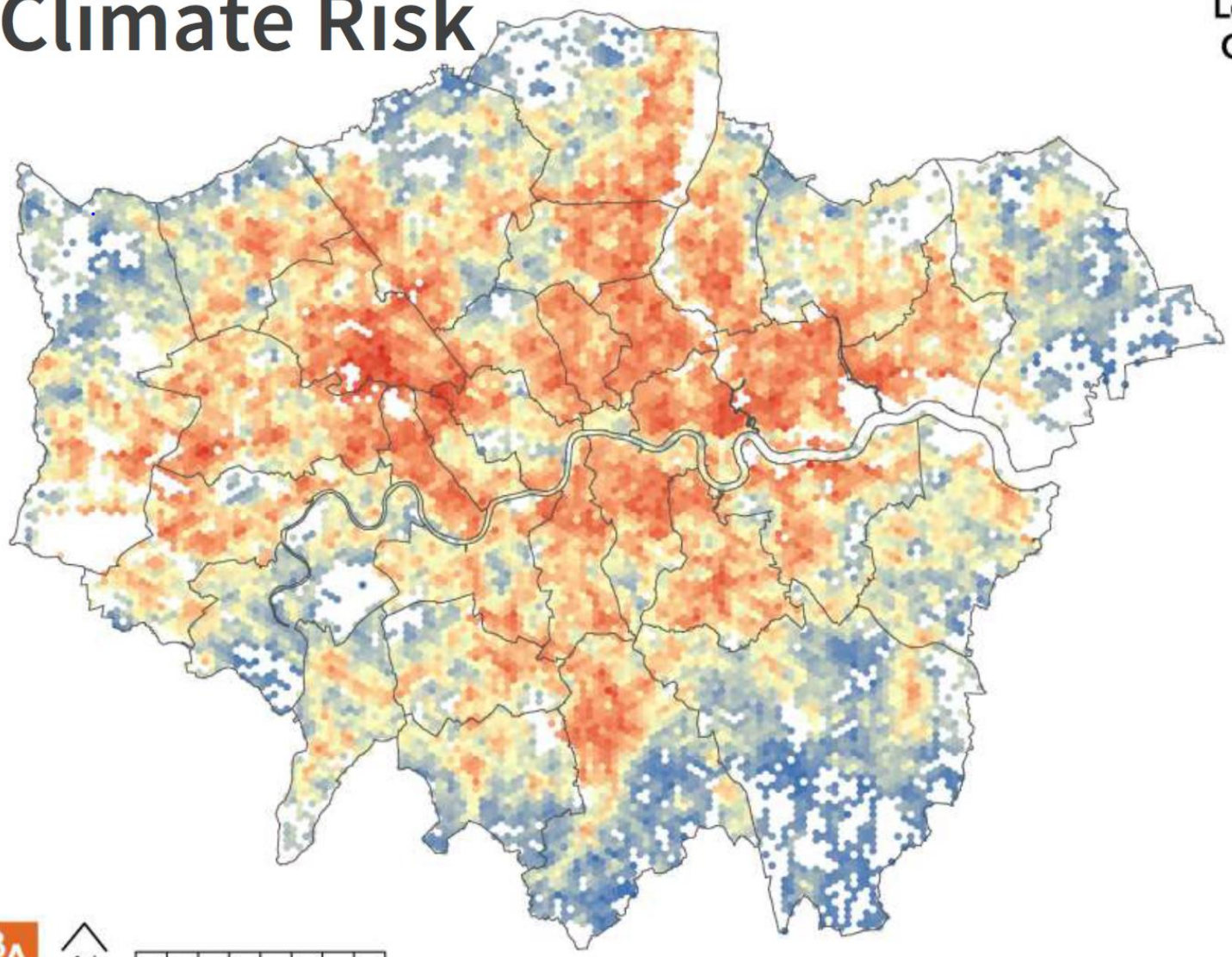
Climate Risk Overlay Maps

Overall Climate Risk



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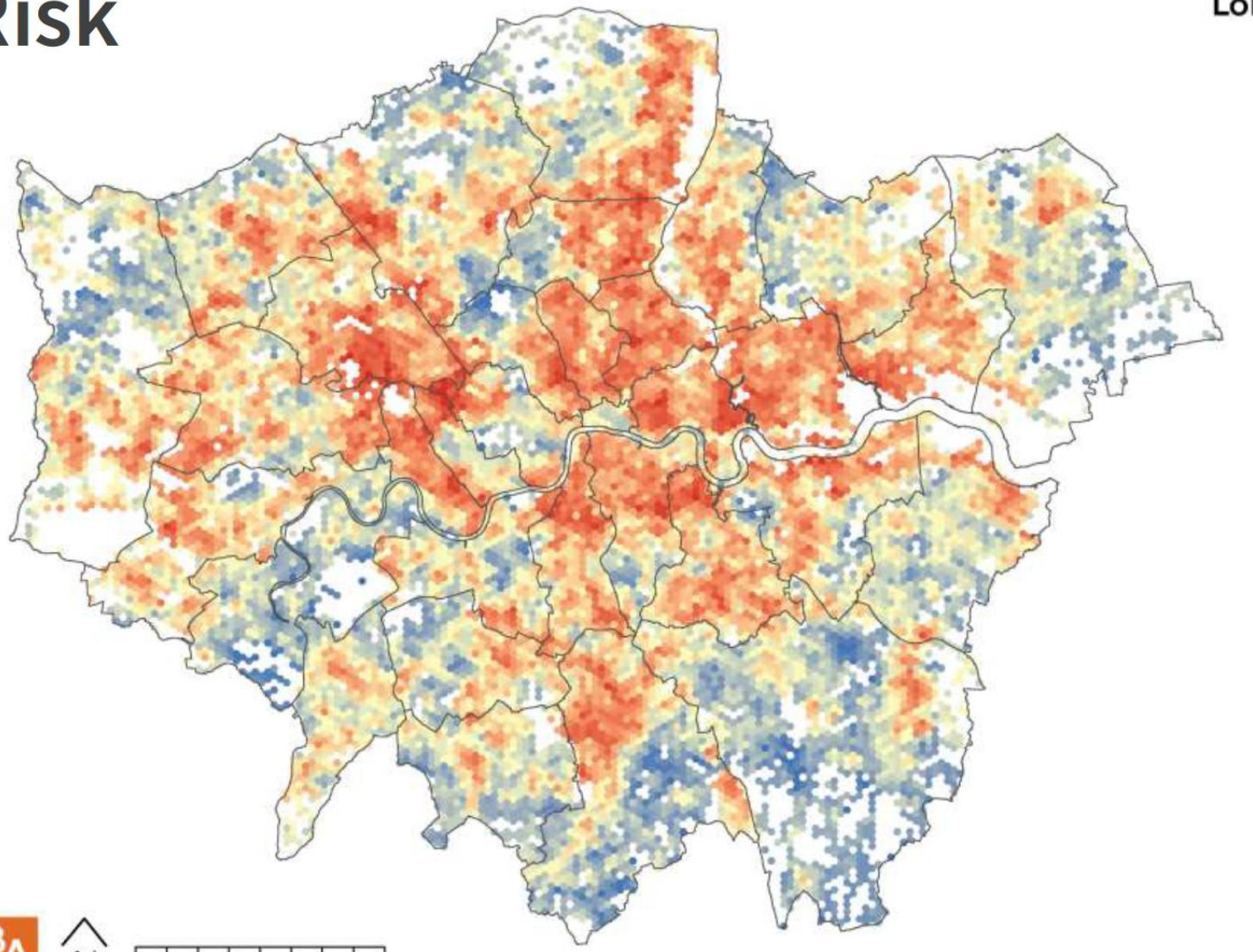
Flood Risk



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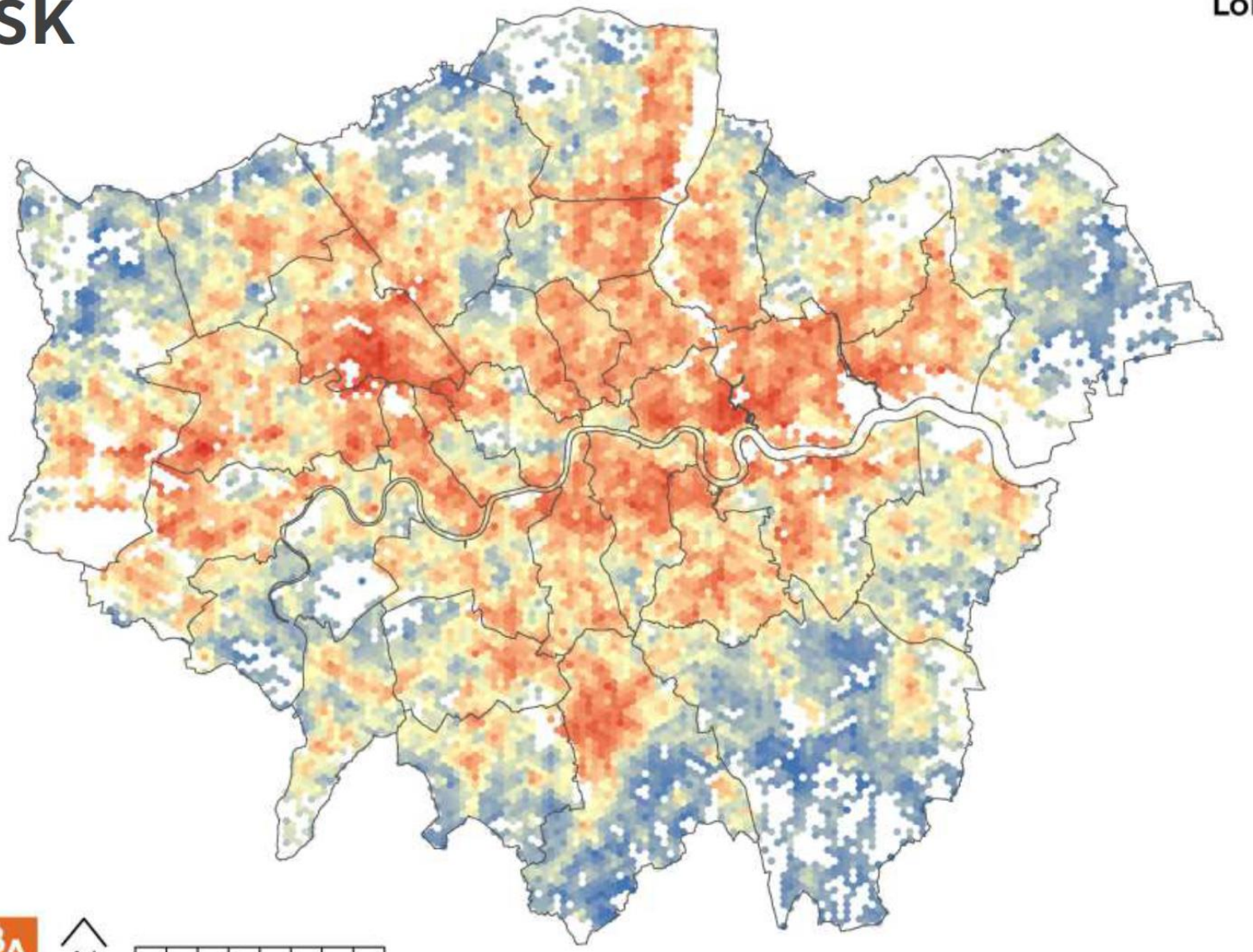
Heat Risk



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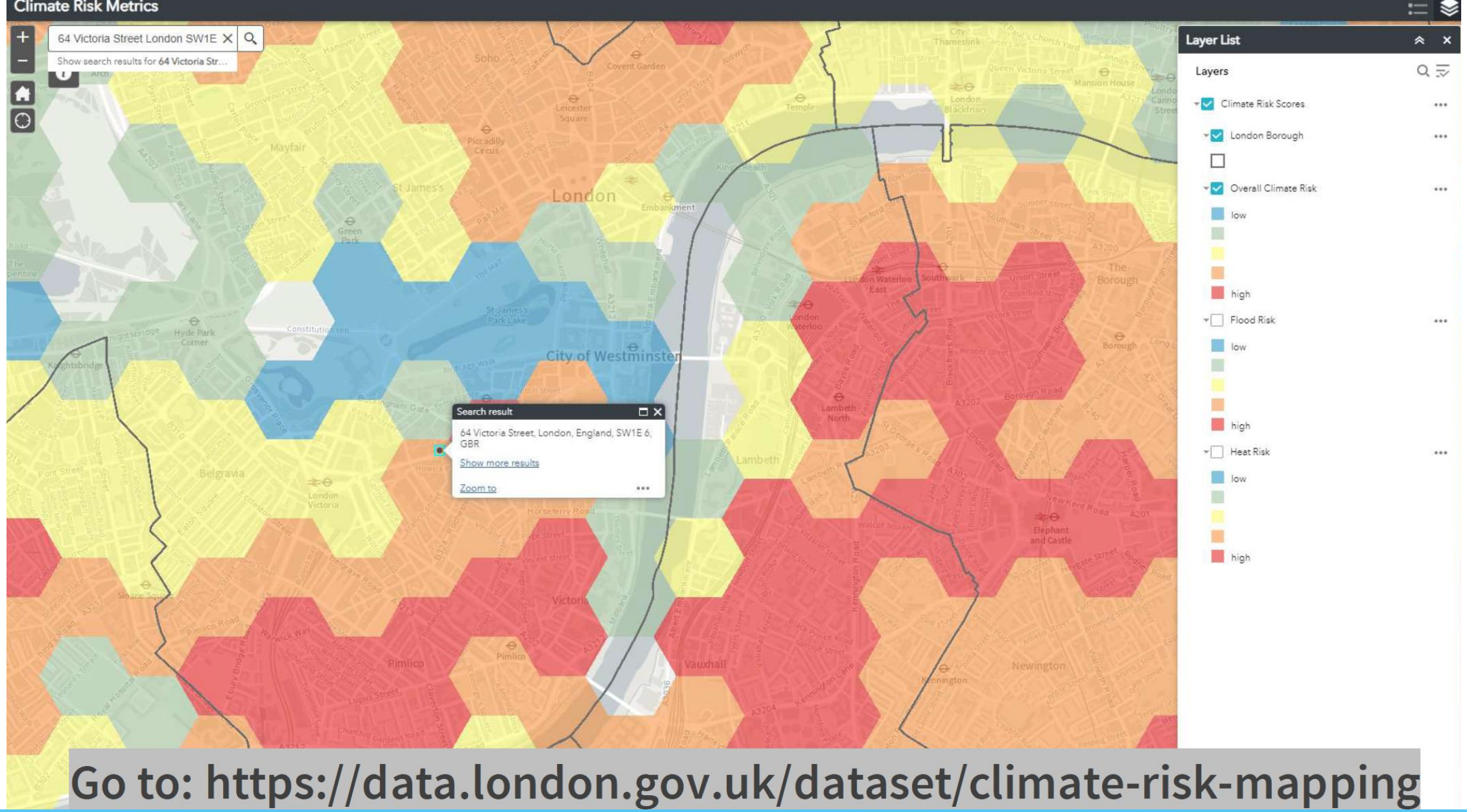

Go to: https://data.london.gov.uk/dataset/climate-risk-mapping

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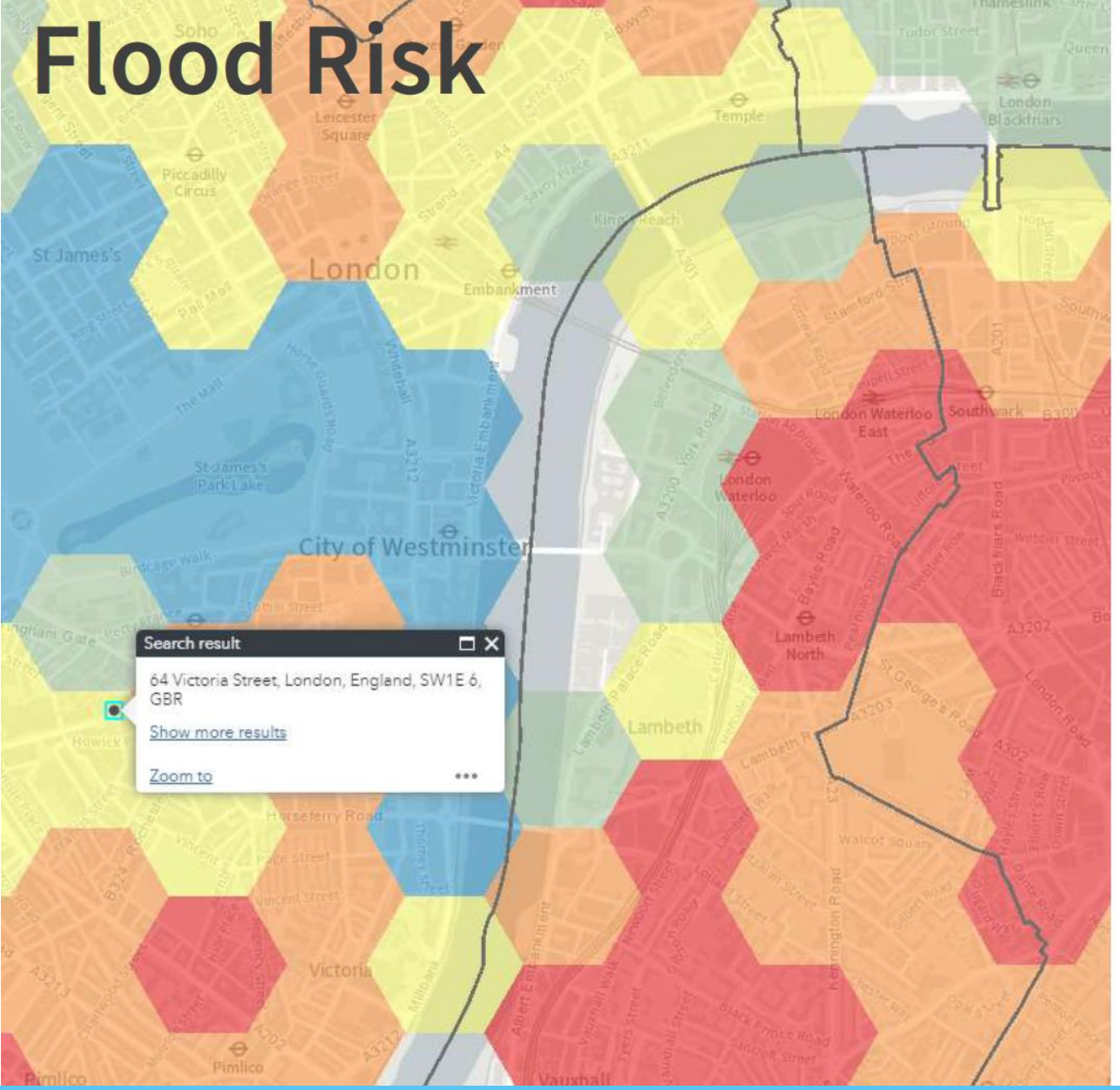
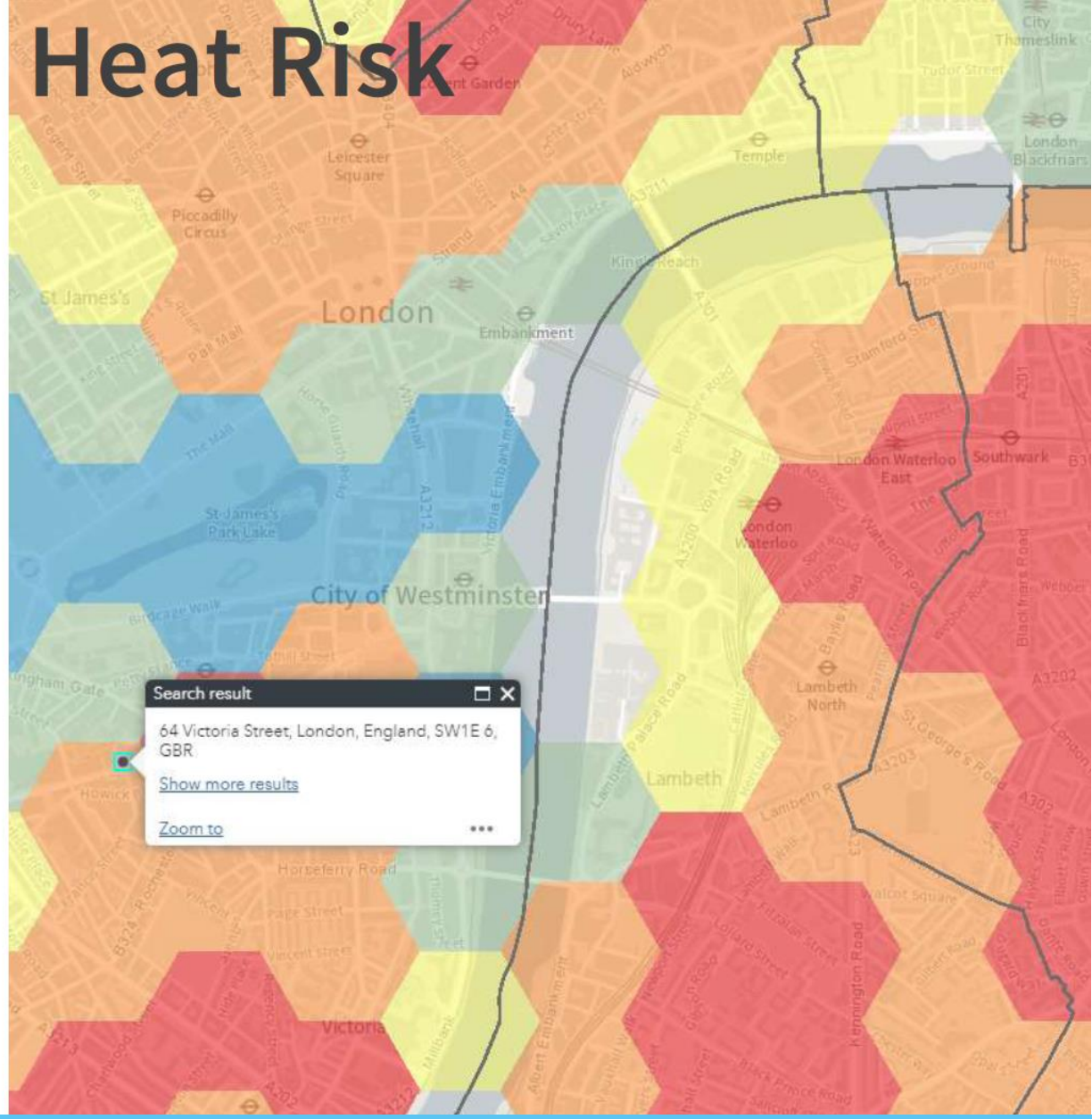
Flood Risk



Heat Risk



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So what is the next step?

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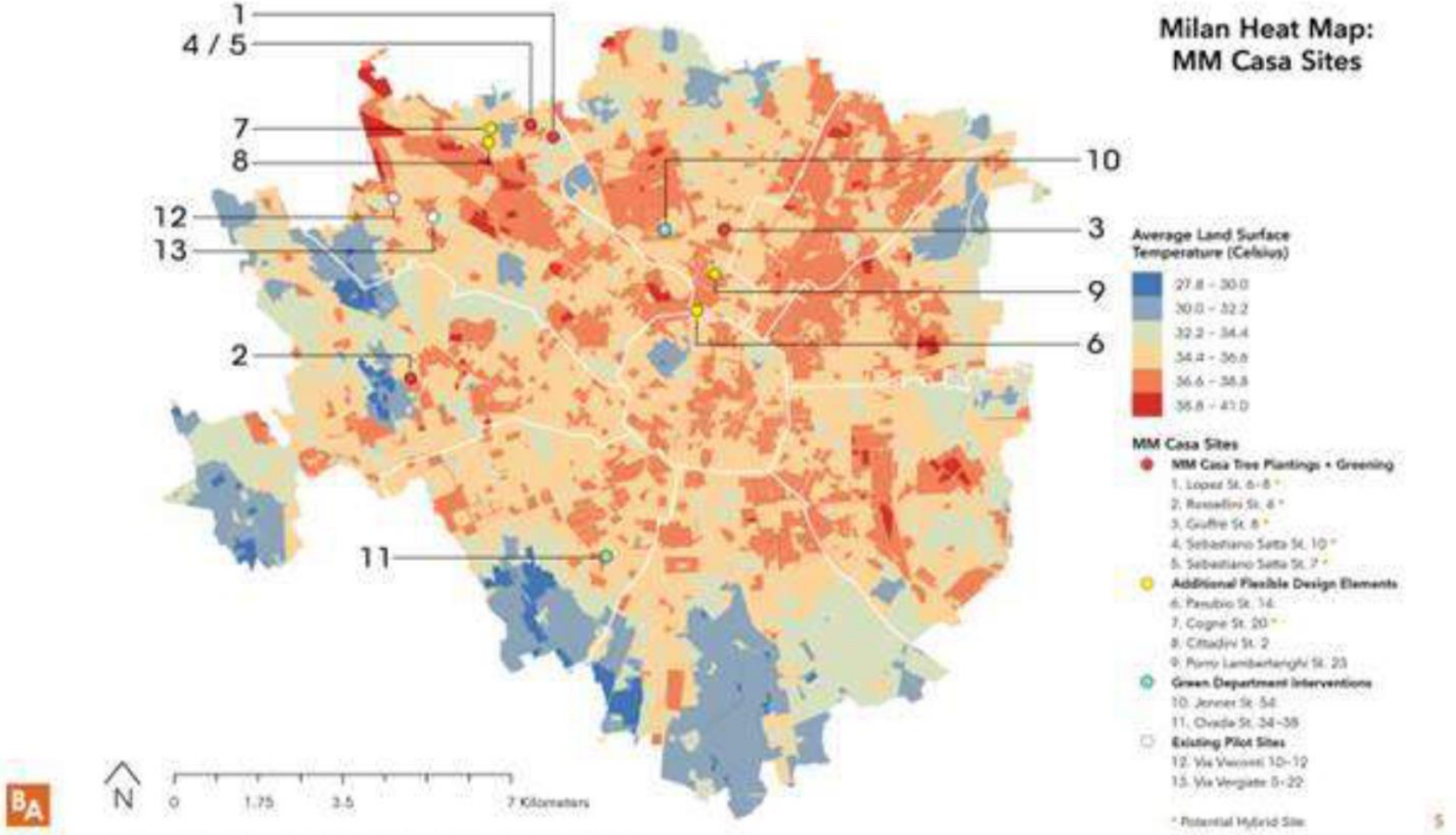
Milan: Planting Trees in Social Housing Sites



Milan: Greening & Depaving in the Hottest Areas

Q&A Session

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Green Infrastructure and Climate Adaptation

Ben Connor

Greater London Authority

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Why adapt?

2000 – flooding
2001 – flooding
2003 – heatwave
2005 – flooding
2006 – drought
2006 – heatwave
2007 – flooding
2008 – flooding
2008 – snow and ice
2009 – snow and ice
2009 – flooding
2010 – flooding
2010 – snow and ice
2011 – warm spring
2011 – warm autumn
2012 – drought
2012 – wet summer
2013 – snow and ice
2013 – heatwave
2014 – flooding
2015 – flooding
2015 – heatwave
2016 – heatwave
2017 – heatwave
2018 – snow and ice
2018 – heatwave
2019 – record heat
2019 – drought
2020 – heatwave
2020 – flooding
2021 – flooding
2021 - heatwave

Flash flooding: July 2021

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Green Infrastructure (Nature based solutions)

- The network of green spaces, rivers and wetlands (as well as features such as street trees and green roofs) that is planned, designed and managed to deliver a range of benefits, including:

- healthy living
- mitigating flooding
- improving air and water quality
- cooling the urban environment
- encouraging walking and cycling
- enhancing biodiversity and ecological resilience

London's trees provide at least £133m of benefits every year in terms of air pollution removal, carbon sequestion and reducing the amount of water going into drains.

2,241

tonnes of pollution removed from the air every year, worth £126M. They remove the equivalent of 13% of PM_{10} particulates and 14% of NO_2 emitted by road transport.

40%

Nearly 40% of London's surface is impermeable; 32% of ground cover is grass.

60%

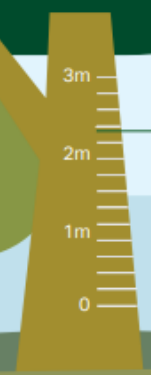
Almost 60% of London's trees are in private ownership, but the trees on public land contribute 60% of the ecosystem service benefits. This is because parks and green spaces have a higher proportion of larger trees.

Trees prevent

10x

The volume of water in the Serpentine from entering London's drainage system. This helps reduce the risk of localised flooding.

Biodiversity – London's trees support and are closely associated with a wide range of priority species such as all bat species, birds like barn owl, butterflies like purple emperor, other insects like stag beetle, and fungu like oak polypore.



2,367,000

tonnes of carbon is stored in London's trees, worth £147M

Pests and diseases – If Asian Longhorn Beetles become established in London, they could damage over 3 million of London's trees leading to a reduction in ecosystem services and associated economic cost.

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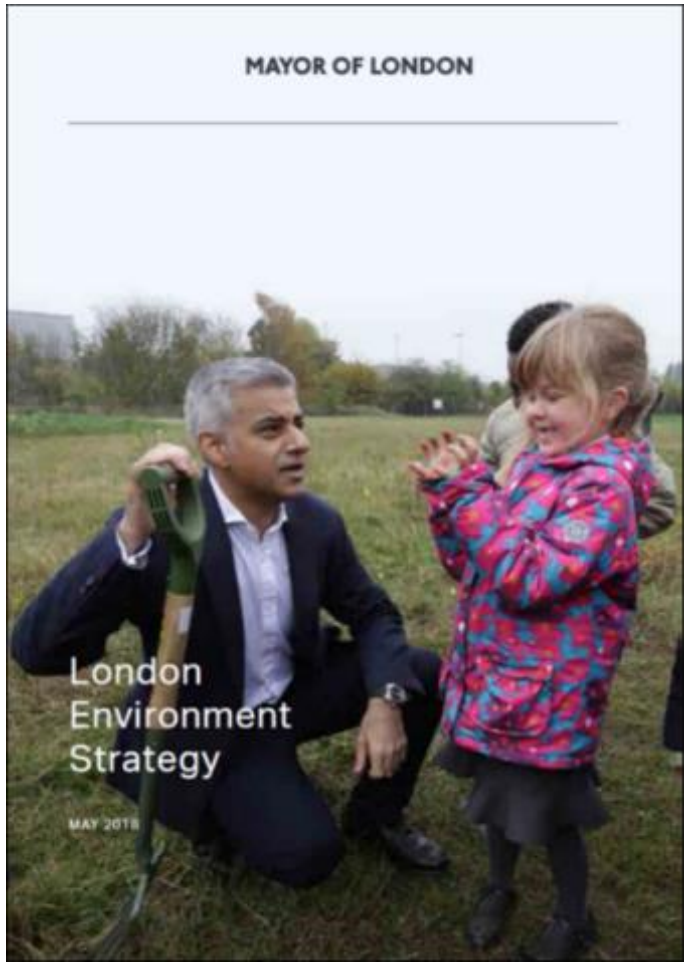
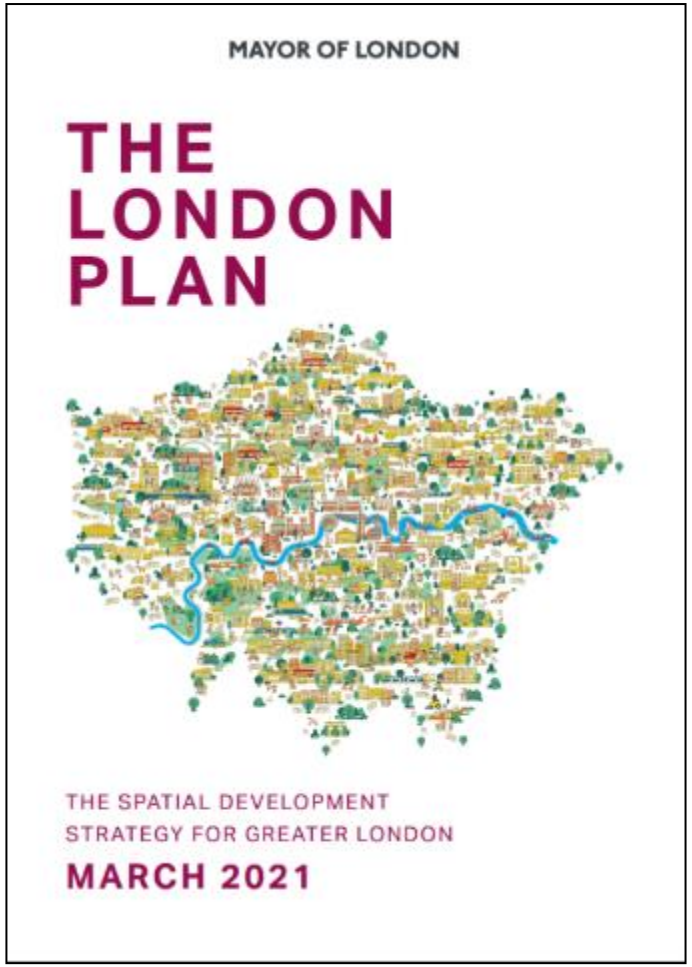
Policy and planning





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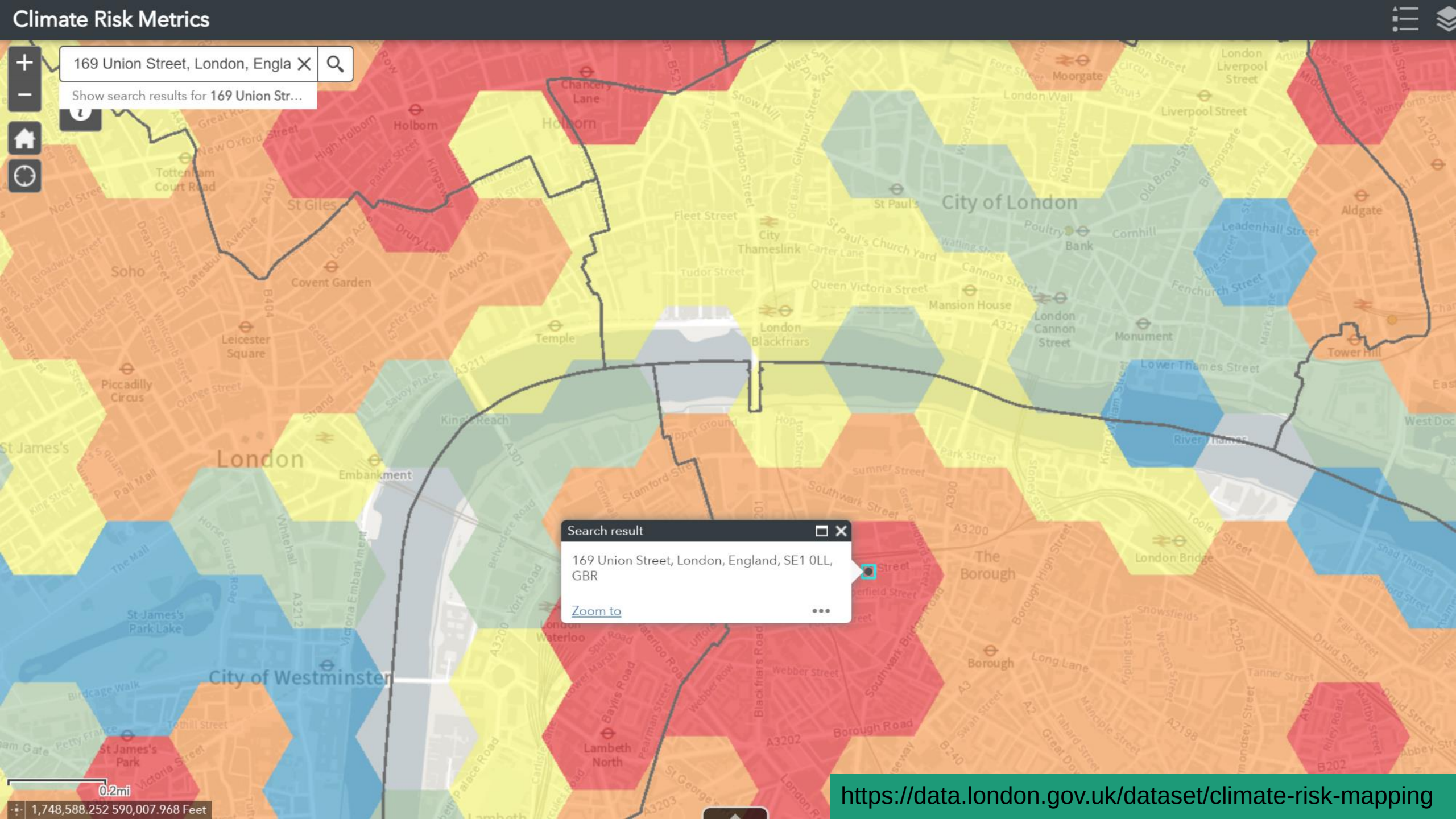
Climate Risk Metrics
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Search result
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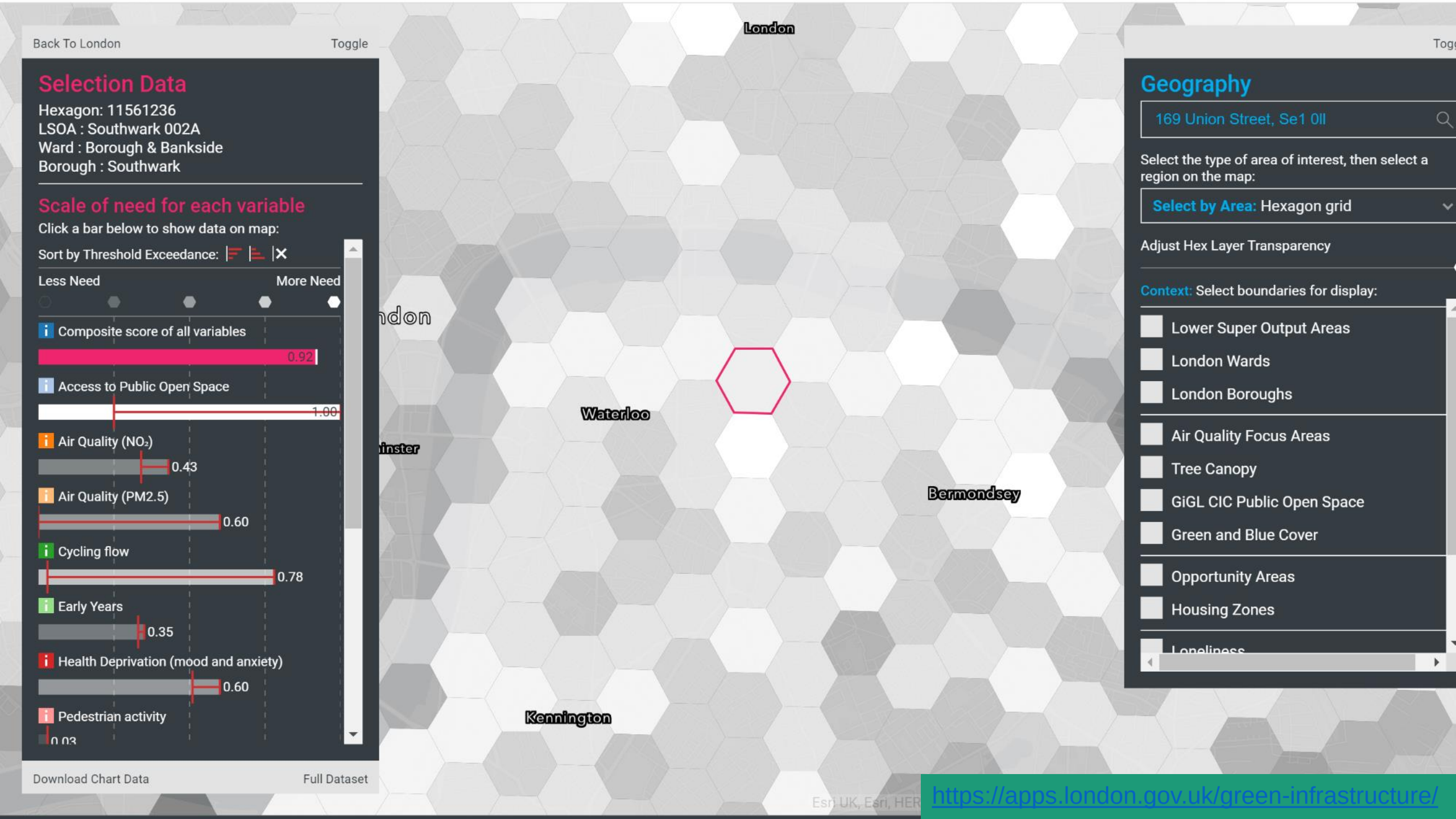

Back To London
Toggle
Selection Data
Hexagon: 11561236
LSOA : Southwark 002A
Ward : Borough & Bankside
Borough : Southwark
Scale of need for each variable
Click a bar below to show data on map:
Sort by Threshold Exceedance:
Less Need
More Need
Composite score of all variables
0.92
Access to Public Open Space
1.00
Air Quality (NO₂)
0.43
Air Quality (PM2.5)
0.60
Cycling flow
0.78
Early Years
0.35
Health Deprivation (mood and anxiety)
0.60
Pedestrian activity
0.03
Download Chart Data
Full Dataset
London
Waterloo
Bermondsey
Kennington
Geography
169 Union Street, Se1 0ll
Select the type of area of interest, then select a region on the map:
Select by Area: Hexagon grid
Adjust Hex Layer Transparency
Context: Select boundaries for display:
Lower Super Output Areas
London Wards
London Boroughs
Air Quality Focus Areas
Tree Canopy
GiGL CIC Public Open Space
Green and Blue Cover
Opportunity Areas
Housing Zones
Loneliness
Esri UK, Esri, HERE
https://apps.london.gov.uk/green-infrastructure/

Guidance

GLA Sector SuDS Guidance

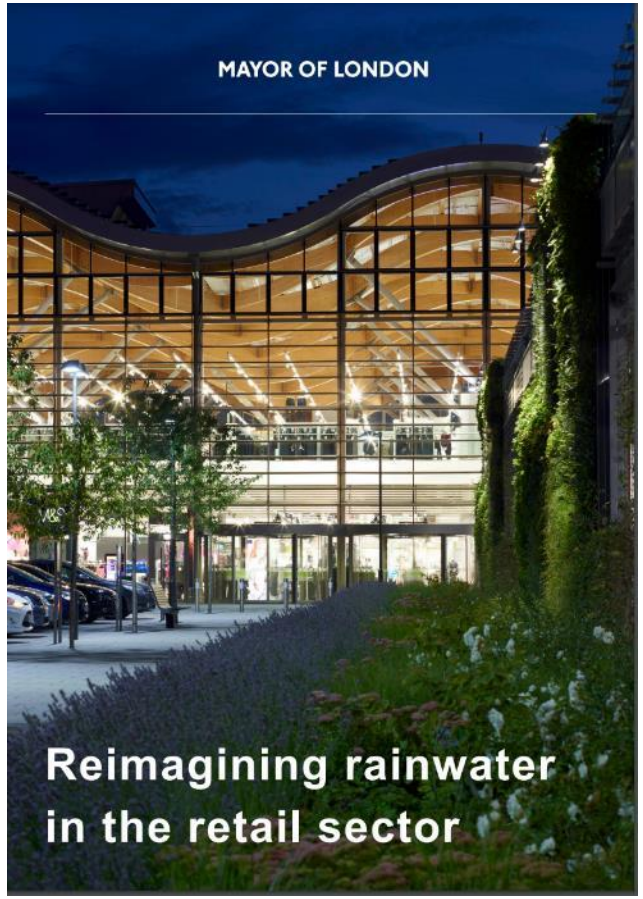
- Retail
- Commercial
- Parks & Green Spaces
- Housing
- Schools
- Hospitals

GLA Community Depaving Guidance

Urban Greening for Biodiversity Net Gain

Urban Design London's Practical Raingarden Guide

Living roofs and walls guidance



BRUNCH · TEA · COFFEE
DRY CLEANERS
KEEP YOUR DISTANCE
FM66 YSU

THANK YOU

ben.connor@london.gov.uk

www.london.gov.uk/what-we-do/environment/parks-green-spaces-and-biodiversity

www.london.gov.uk/what-we-do/environment/climate-change/climate-adaptation

Q&A Session

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Urban Greening and Recommendations

Fiona Coull

Cross River Partnership

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Healthy Streets Everyday Overview

- 3 year Mayor's Air Quality Funded Programme
- Working with 16 borough partners, land owners and Business Improvement Districts
- Delivering initiatives related to the following six key workstreams:

1. Streetscape improvements
2. New traffic regulations to make streets more pedestrian-friendly
3. Car-free behaviour
4. Guidance on how to create Healthy Streets Everyday
5. Communications
6. Evaluation and monitoring of project interventions

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“Greening out the Grey” - New HSE Guidance

CRP’s Healthy Streets Everyday Programme is pleased to launch its new Guidance Document:

“GREENING OUT THE GREY": The value of Green Infrastructure for People and Places.

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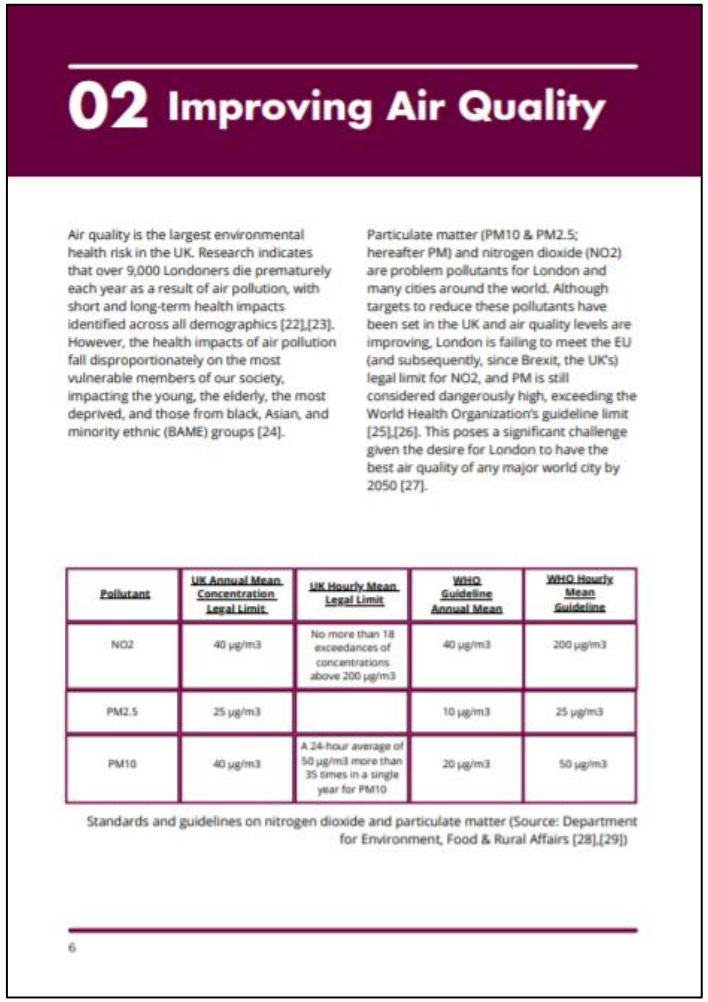
Greening and Air Quality



02 Improving Air Quality

Air quality is the largest environmental health risk in the UK. Research indicates that over 9,000 Londoners die prematurely each year as a result of air pollution, with short and long-term health impacts identified across all demographics [22],[23]. However, the health impacts of air pollution fall disproportionately on the most vulnerable members of our society, impacting the young, the elderly, the most deprived, and those from black, Asian, and minority ethnic (BAME) groups [24].

Particulate matter (PM10 & PM2.5; hereafter PM) and nitrogen dioxide (NO2) are problem pollutants for London and many cities around the world. Although targets to reduce these pollutants have been set in the UK and air quality levels are improving, London is failing to meet the EU (and subsequently, since Brexit, the UK's) legal limit for NO2, and PM is still considered dangerously high, exceeding the World Health Organization's guideline limit [25],[26]. This poses a significant challenge given the desire for London to have the best air quality of any major world city by 2050 [27].

Pollutant	UK Annual Mean Concentration Legal Limit	UK Hourly Mean Legal Limit	WHO Guideline Annual Mean	WHO Hourly Mean Guideline
NO2	40 µg/m3	No more than 18 exceedances of concentrations above 200 µg/m3	40 µg/m3	200 µg/m3
PM2.5	25 µg/m3		10 µg/m3	25 µg/m3
PM10	40 µg/m3	A 24-hour average of 50 µg/m3 more than 35 times in a single year for PM10	20 µg/m3	50 µg/m3

Standards and guidelines on nitrogen dioxide and particulate matter (Source: Department for Environment, Food & Rural Affairs [28],[29])

6

- Research indicates that over 9,000 Londoners die prematurely each year as a result of air pollution
- Legal limits that have been set and are in place
- Dispersion and dispersal can help to reduce the pollution exposure for population
- Impact of different street designs on air quality exposure

The UK economy could save **£1.6 billion** each year if it achieved WHO guidelines (CBI Economics)

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Greening and Heat Resilience

03 Heat Resilience & Cooling

Evidence of global warming of the earth's surface temperatures, derived from many direct and indirect data sources such as thermometers, observations, tree rings and ice cores, shows a 1° Celsius rise since 1900 [46],[47]. A business-as-usual, high emission projection scenario, modelled by the IPCC, could see average surface temperature rises of up to 4.5° Celsius, from 1850-1900 levels [48].

London is now looking to build its heat resilience, as the climate may look more like Marseille or Barcelona's in 2050 [49]. London also suffers from the most significant impacts of the Urban Heat Island effect in the UK, where a metropolitan area is a lot warmer than the rural areas surrounding it [50].

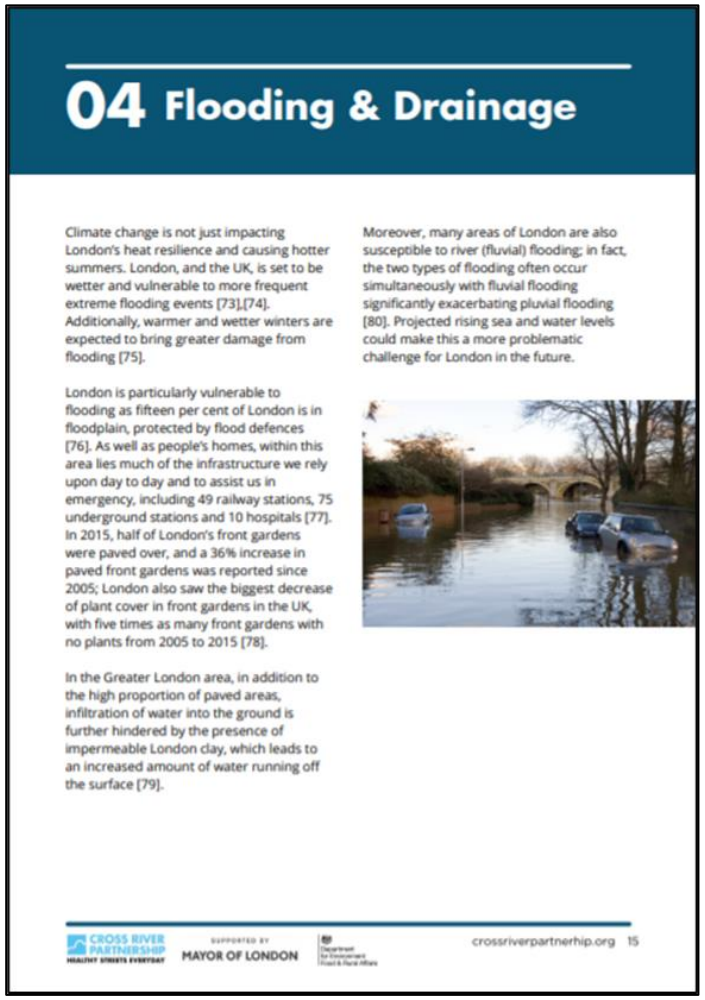
London has seen mean summer temperature increase by c.1.9°C between 1961 and the early 21st Century [51], but despite this, there is limited evidence yet that the Urban Heat Island effect is amplified further by rising temperatures [52]. Nevertheless, heatwaves (like the one experienced in 2018) will become normal by 2040, hot summers will become far more frequent, and days of potential and projected overheating in London are set to increase [53].

Building designs also create challenges for Londoners in implementing and maintaining heat resilience. Many modern buildings have benefitted in cooler months from improvements in insulation, plenty of sunlight and limited ventilation [54]. However, with summer months becoming more extreme for heat, this has become a significant challenge for many who live and work in London. This is coupled with regulatory challenges as part of the planning system; currently regulations are in place for heating buildings, but there are no regulations for the cooling of buildings, or for very hot and busy transport systems [55].

- London is now looking to build its heat resilience, as the climate may look more like Marseille or Barcelona's in 2050.
- Is infrastructure sufficient?
- Parks have a significant impact, but what about small scale greening on grey infrastructure?
- Intensive green roofs can improve ambient temperatures at the pedestrian level by up to 1.7°, and more at the roof level.

The economic cost of fatalities from poor heat resilience could range from **£323 million to £9.9 billion** per year by the 2050s

Greening and Flooding



04 Flooding & Drainage

Climate change is not just impacting London's heat resilience and causing hotter summers. London, and the UK, is set to be wetter and vulnerable to more frequent extreme flooding events [73],[74]. Additionally, warmer and wetter winters are expected to bring greater damage from flooding [75].

London is particularly vulnerable to flooding as fifteen per cent of London is in floodplain, protected by flood defences [76]. As well as people's homes, within this area lies much of the infrastructure we rely upon day to day and to assist us in emergency, including 49 railway stations, 75 underground stations and 10 hospitals [77]. In 2015, half of London's front gardens were paved over, and a 36% increase in paved front gardens was reported since 2005; London also saw the biggest decrease of plant cover in front gardens in the UK, with five times as many front gardens with no plants from 2005 to 2015 [78].

In the Greater London area, in addition to the high proportion of paved areas, infiltration of water into the ground is further hindered by the presence of impermeable London clay, which leads to an increased amount of water running off the surface [79].

Moreover, many areas of London are also susceptible to river (fluvial) flooding; in fact, the two types of flooding often occur simultaneously with fluvial flooding significantly exacerbating pluvial flooding [80]. Projected rising sea and water levels could make this a more problematic challenge for London in the future.

- Vulnerability: London is particularly vulnerable to flooding as fifteen per cent of London is in floodplain, protected by flood defences
- Use of SuDS
- Tree cover: rainwater interception, can reduce the impact of storms – up to 30% can be evaporated back into atmosphere off the canopy

Flood damage currently costs the UK around **£1.3 billion** each year

Greening for Mental Health

05 Green Social Prescribing

The UK is facing a mental and physical health crisis. Aging populations are leading to an increased strain on our health services as elderly people live longer. Analysis by Sports Think Tank from 2016 showed that England scores slightly below the global average of "the percentage of the population who are achieving the recommended or sufficient amounts of physical activity per week", at 59% (the average is 63%) [98]. Additionally, in the UK, 10,780 hospital admissions are directly attributable to obesity [99].

Mental health awareness has also increased over the last decade, with more people experiencing mental and emotional distress, and the subject becoming less taboo and more widely discussed. 1 in 6 people report experiencing a common mental health problem (like anxiety and depression) in any given week in England [100]. Moreover, nearly half (43.4%) of adults think that they have had a diagnosable mental health condition at some point in their life [101].

The coronavirus pandemic has placed more strain on people's mental and physical health, with more time spent indoors, many people spending more time alone, and official and unofficial networks of support not being available to people to maintain physical and mental health [102].

It is likely that each one of us will have a mental health challenge at some point in our life, and COVID-19 has demonstrated this vulnerability in many of us.

There is emerging evidence that suggests these mental and physical health challenges are exacerbated in cities. Cities may be with higher rates of most mental health problems compared to rural areas with an almost 40% higher risk of depression, over 20% more anxiety, and double the risk of schizophrenia, in addition to more loneliness, isolation and stress [103]. Additionally, inequality over green spaces and outdoor spaces for physical activity can exacerbate both mental and physical health problems [104].

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- Cities may be associated with higher rates of most mental health problems compared to rural areas with an almost 40% higher risk of depression, over 20% more anxiety, and double the risk of schizophrenia, in addition to more loneliness, isolation and stress
- 44% of adults found that being around nature helped them feel less worried and anxious
- Premium on green space

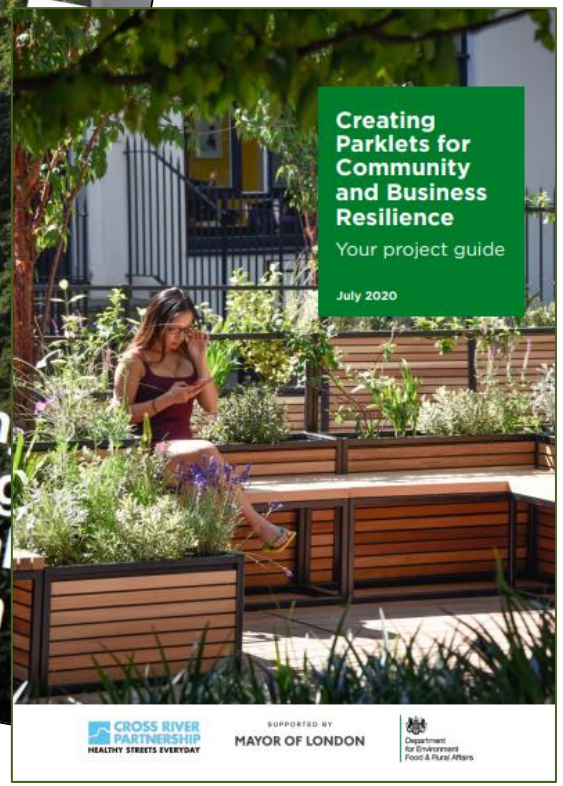
Mental health's cost to the UK economy has been estimated at between **£94 - 105 billion**

Recommendations

<u>The guidance highlights 9 key recommendations:</u>

1. More evidence of scientific impacts
2. More evidence of financial impacts
3. A more collaborate and joined up approach
4. Implement cooling regulations
5. Use green infrastructure to offset, disperse and deposit transport emissions and reduce exposure
6. Integrate green infrastructure into new development as a flood defence and mitigation strategy
7. Create an annual survey on mental health and green spaces
8. Embrace the wild
9. Set, specific, local targets for greening

Other CRP Greening Work



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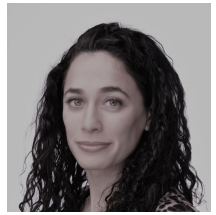

Lauren Racusin
Bloomberg Associates
lracusin@bloomberg.org

Ben Connor
Greater London Authority
ben.connor@london.gov.uk

Fiona Coull
Cross River Partnership
fionacoull@crossriverpartnership.org

Rachael Aldridge
Cross River Partnership
rachaelaldridge@crossriverpartnership.org

www.crossriverpartnership.org

@CrossRiverPartnership

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