# The Right to Clean Air:

## Protecting and Empowering Communities

## Chair:
## Tomos Joyce,
## Guidance Manager

GUY'S & ST THOMAS' CHARITY

Tranquil City

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# Today's Speakers

Matt Towner
Portfolio Manager
Guy's & St Thomas' Charity

**Speaker**

Grant Waters
CEO & Acoustician
Tranquil City

**Speaker**

Ben Warren
COO & Air Quality Expert
Tranquil City

**Speaker**

Abby McDougall
Technical Project Officer
Cross River Partnership

**Speaker**

Tomos Joyce
Guidance Manager
Cross River Partnership

**Chair**

Anusha Rajamani
Project Officer
Cross River Partnership

**Chat Moderator**

Rachael Aldridge
Project Officer
Cross River Partnership

**Technical Lead**

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# Today's Agenda

1. CRP: Introduction and Context

2. GSTCC: Health Effects of Air Quality

3. TC & CRP: Clean Air Walking Routes

4. Final Observations

**Have your say:**
Q/A session after each presentation

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# Introduction and Context

## Tomos Joyce, CRP

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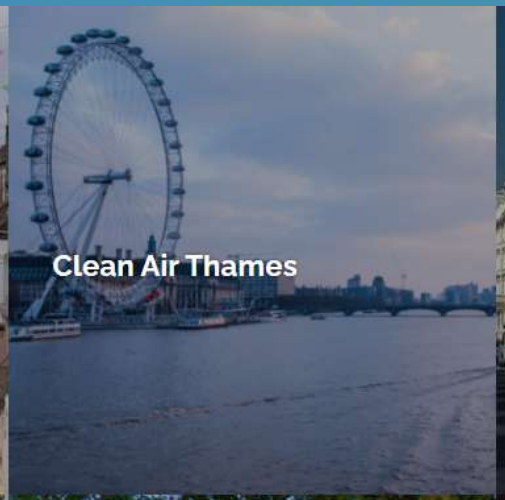
# CRP Projects










# Our Vision

## People

Work with engaged people, connecting stakeholders to successfully collaborate and deliver

## Places

Deliver great places, sharing best practice whilst ensuring all businesses are supported to grow sustainably

## Projects

Deliver innovative projects for partners encouraging businesses to shift from incremental to permanent change, whilst inspiring others to do more at pace

**Working towards sustainable businesses and improving air quality.**

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# The Imperative for Improving Air Quality

**70% of Londoners** want the government and local authorities to **tackle air pollution and traffic more urgently** than before the coronavirus outbreak.


*Source: Global Action Plan's Business for Clean Air (B4CA)*

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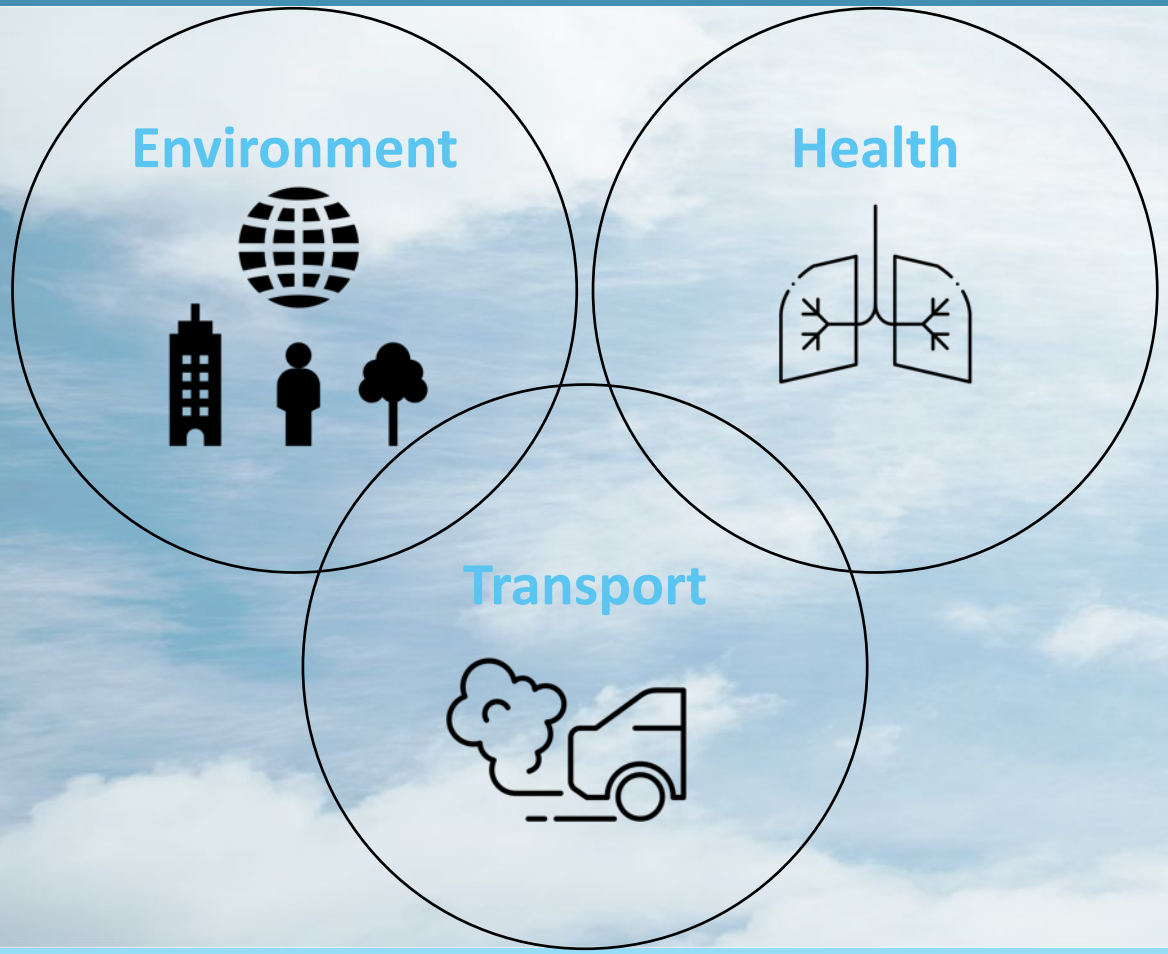
# The Imperative for Improving Air Quality




***"You could pick any city in the world and expect to see an effect of air pollution on people's risk of getting sicker from coronavirus".***

Aaron Bernstein, Director of the Center for Climate, Health, and Global Environment at Harvard University.

***"Dirty air is preventing people of colour, in low-income communities in particular, from being able to have a fighting chance against this pandemic".***

Gina McCarthy, president of the Natural Resources Defence Council, US.

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# Protecting and Empowering Communities

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# Health Effects of Air Quality


## Matt Towner, Guy's & St Thomas' Charity




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# Health Effects of Air Pollution

## Guy’s and St Thomas’ Charity

# Who we are

Guy's and St Thomas' Charity an **independent**, **place-based foundation.** We're over 500 years old.

Our purpose is to work with Guy's and St Thomas' NHS Foundation Trust and other partners to **improve the health of people in the London boroughs of Lambeth and Southwark.**

We focus on **tackling complex health issues** that are prevalent locally but also relevant to other urban areas across **London, the UK and internationally**.

# What we do

We address **the major health challenges facing people living in urban, diverse and deprived areas** – developing new approaches to health and sharing what we learn.

Working with others, we take a **place-based approach**. We **support and layer interventions**, addressing the issue from different angles.

# Our programmes

We take a programmatic approach to achieve impact.

We are currently working to:

- Reduce **childhood obesity**
- Slow down people's progression to **multiple long-term conditions**
- Address the **health effects of air pollution**
- Prevent and support **adolescent mental health** issues

# How we work

Our programmes have three stages:

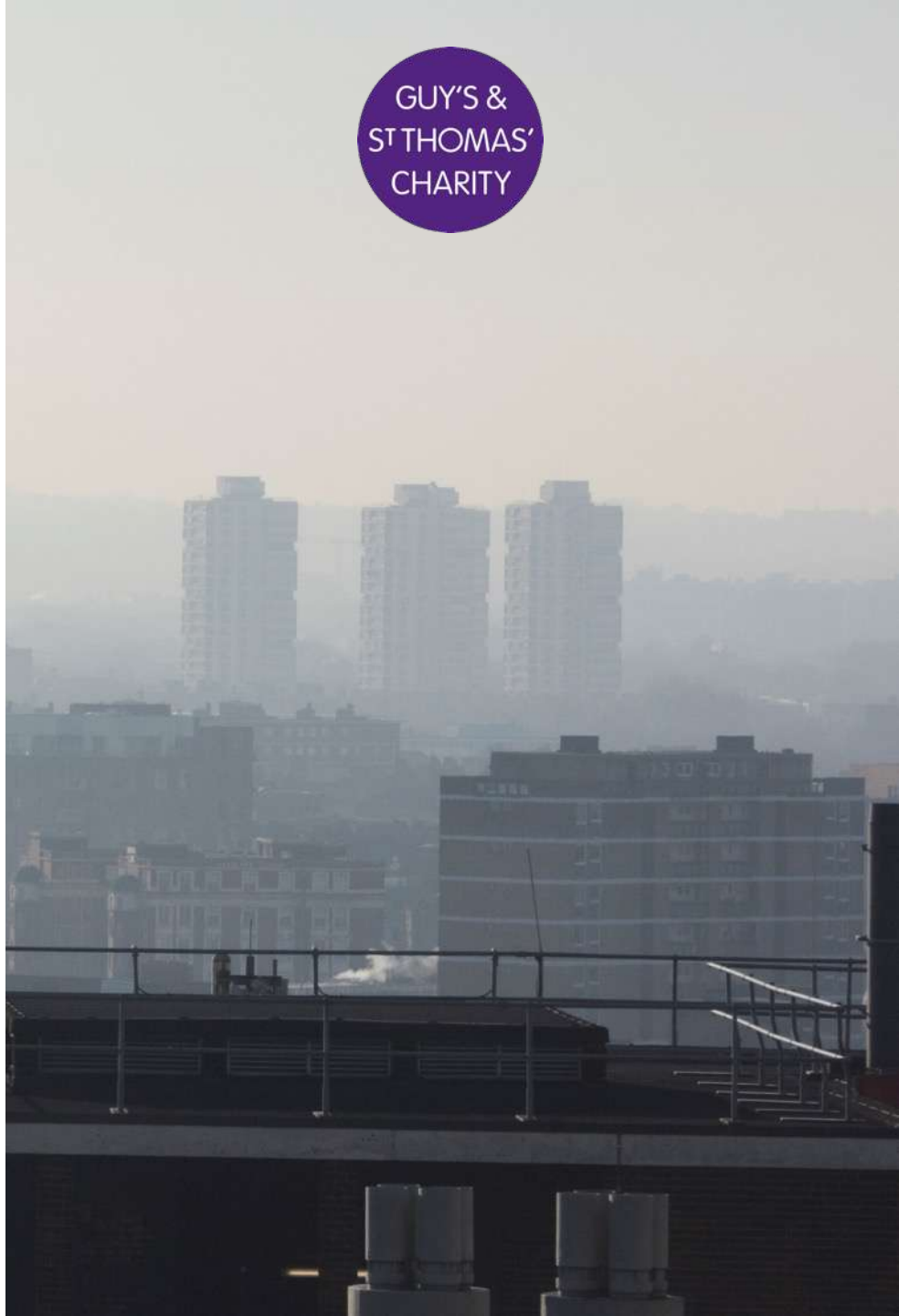
- **Search** – understand the issue, evidence and local context
- **Develop** – identify partners, test our assumptions and share our thinking
- **Deliver** – launch partnerships, learn from our work and share our insights

# Health effects of air pollution

We are running a **ten-year programme** to **explore** how people's health is affected by air pollution, and **test solutions** to mitigate these effects.

We want to **improve the health** of the people whose health is **most impacted** by poor air quality.

Over the next ten years, we will **partner** with other organisations to **deliver projects**, do **research** and share what we learn to **influence change** at local, borough, city, national and international levels.



# Why air pollution

We see tackling air pollution as key to addressing some of the **systemic causes of health inequalities** in urban communities.

We know the air is particularly polluted in inner-city areas, and in particular our boroughs.

Poor air quality often makes the headlines, but less is known about **what genuinely works** to reduce its impact on people's health.

# Air pollution in our boroughs

There are three main pollutants associated with poor health in inner cities:

- NO2 (Nitrogen Dioxide), typically in areas of high vehicle traffic.
- PM2.5 or particulate matter, such as soot, smoke, dust and liquid droplets measuring less than 2.5 micrometres in diameter.
- PM10 are larger particles than PM2.5 and come from similar sources.



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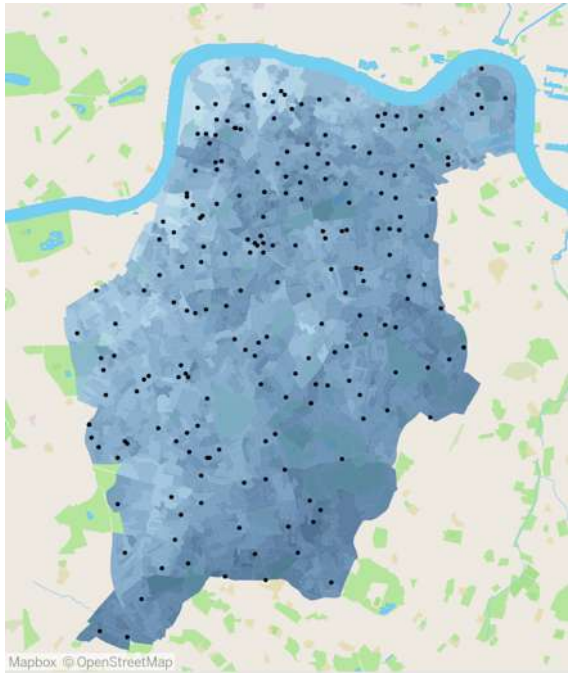
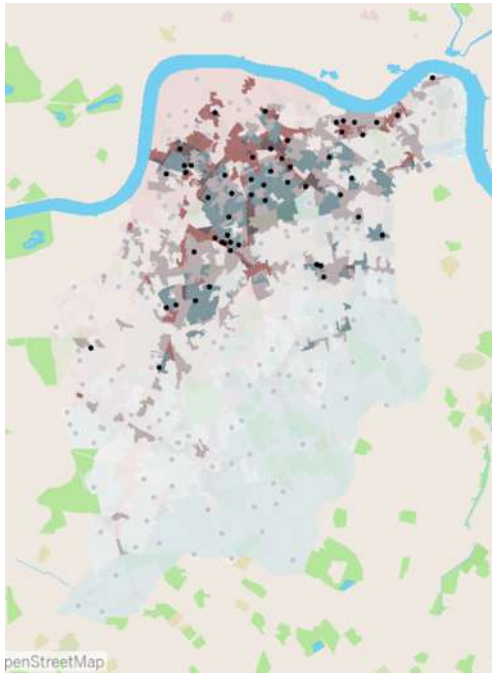
# Air pollution in our boroughs


The entire footprint of our boroughs of Lambeth and Southwark **exceeds the World Health Organisation guidelines** for particulate matter




We focus on those most susceptible: **children** from pregnancy to early adolescence, **people with heart and lung conditions** and **older people**.




We think that air pollution has the biggest impact on people's health where there are both **high levels of exposure and a high proportion of susceptible people**

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# Air pollution in our boroughs

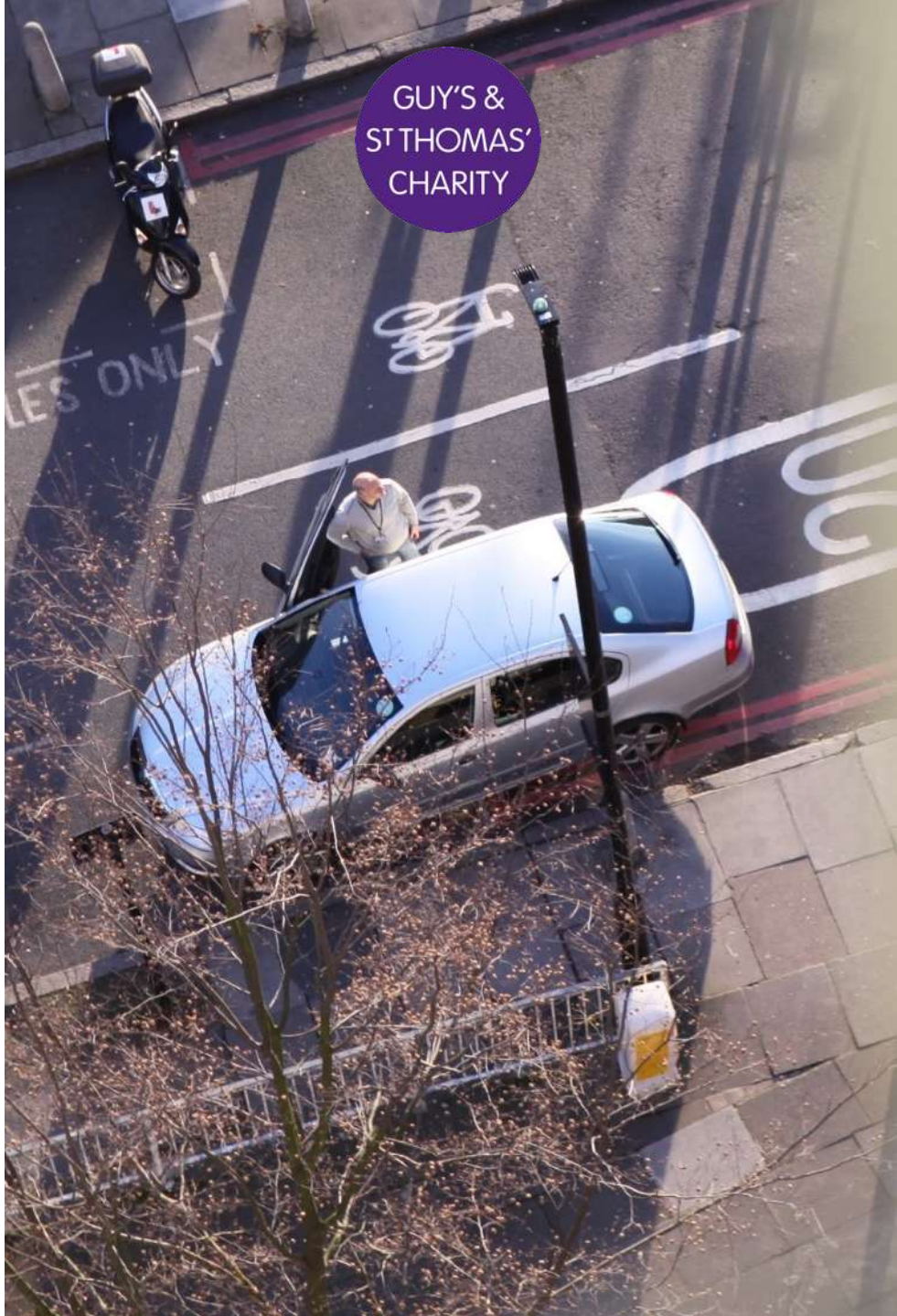
In Lambeth and Southwark the primary sources of air pollution are:

PM 2.5:

- Road transport (32%)
- Cooking (22%)
- Wood burning (13%)
- NRMM exhaust (13%)

NO2:

- Road transport (60%)
- Commercial gas (16%)
- Domestic gas (11%)
- NRMM exhaust (11%)



# Air pollution and inequalities

Air pollution is a **driver of health inequalities** – and a **social justice issue**.

We see these inequalities as three fold:

1. Those most impacted by air pollution are least likely to contribute to it (less likely to own a car, or a wood burner)
2. Those most impacted by air pollution are more likely to be negatively impacted by other determinants of health such as unemployment, low income and systemic racism
3. Our evidence suggests those most impacted by air pollution are less likely to be engaged or heard in decisions to address air pollution

# What works: principles

A review of what works by KCL (now Imperial) Environmental Research Group found:

- “Few interventions identified assessed the effect on air quality, and even fewer considered the impact on public health"
- Lots of examples where positive impacts have been achieved e.g. reasonable to assume shifting from driving a car to riding a bike is an improvement
- A number of promising avenues:
  - Reducing emissions at source
  - Targeting vulnerable people with behavioural interventions
- A number of key evidence gaps:
  - Indoor air pollution
  - Air quality in population centres like hospitals and nurseries

# What works: example interventions

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| What works | Mixed or unproven impact | Limited or no impact |
|---|---|---|
| • Delivery consolidation schemes | • Electric vehicles | • Road coatings |
| • NRMM policies (e.g. low emission zone) | • Tree planting | • Street sweeping and cleaning |
| • Low emission bus zones | • Green screens | |
| | • Low emission neighbourhoods | |
| | • Smarter driver training | |

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# Behavioural interventions

We also commissioned a specific review of behavioural interventions. Key findings included:

- Air pollution should not be a problem for individuals alone to solve
- Interventions should ideally alter people's environment to reduce need for individual behaviour change
- Modal shift: built environment, public transport and related incentives, and car sharing had clearest evidence of impact
- Reducing exposure: low-exposure walkways and cycle paths most proven
- Information and training alone generally aren't enough
- More evaluation required

# Our programme of work

In the develop stage of the programme we are seeking to:

- Creating a **compelling case for change** by generating high quality evidence
- Engage and **amplify voices** of those most impacted
- **Reduce exposure** to air pollution in environments people spend their time
- **Work with businesses** to find equitable solutions to reducing emissions

# What our work looks like

## Southwark Streetscapes

**Project:** Supporting Southwark Council to make changes to street layouts using experimental traffic orders to increase walking and cycling and enable social distancing.

**Impact:** Improved understanding of the relationship between street changes and changes in active travel and car usage

## Clean Air for Schools Pilot

**Project:** Working with Global Action Plan, University of Surrey and Arup to explore air pollution in five schools in Lambeth and then supporting the identification and implementation of specific interventions.

**Impact:** Improved understanding of what interventions work to reduce air pollution and exposure to air pollution in school environments.

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# Questions?

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# Clean Air Walking Routes

Grant Waters & Ben Warren, Tranquil City
Abby McDougall, Cross River Partnership

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# 9,400

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# 9,400

# 180 per week

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# 9,400

# 180 per week

## Extra 74 children hospitalised

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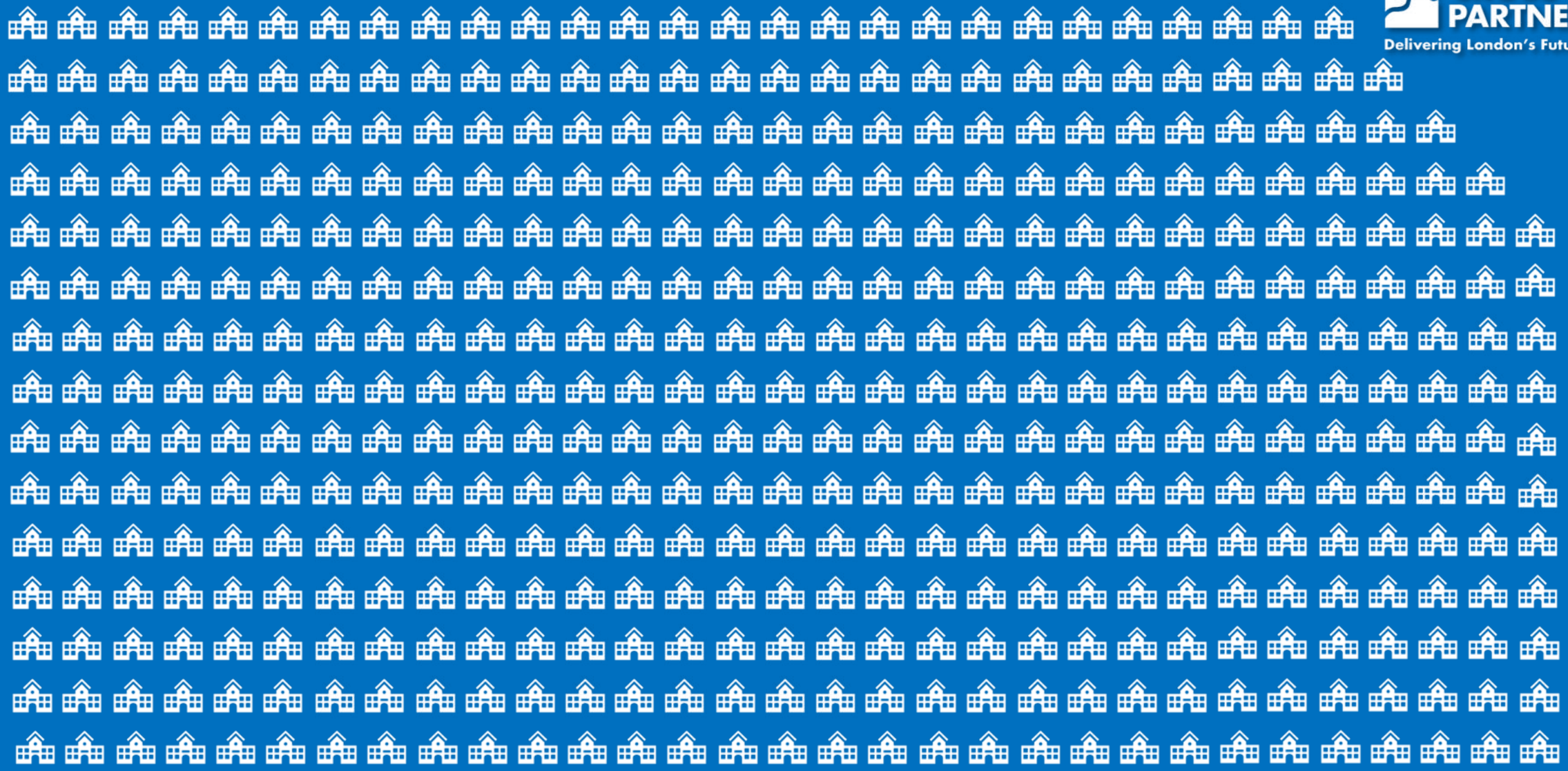

455 in 2016

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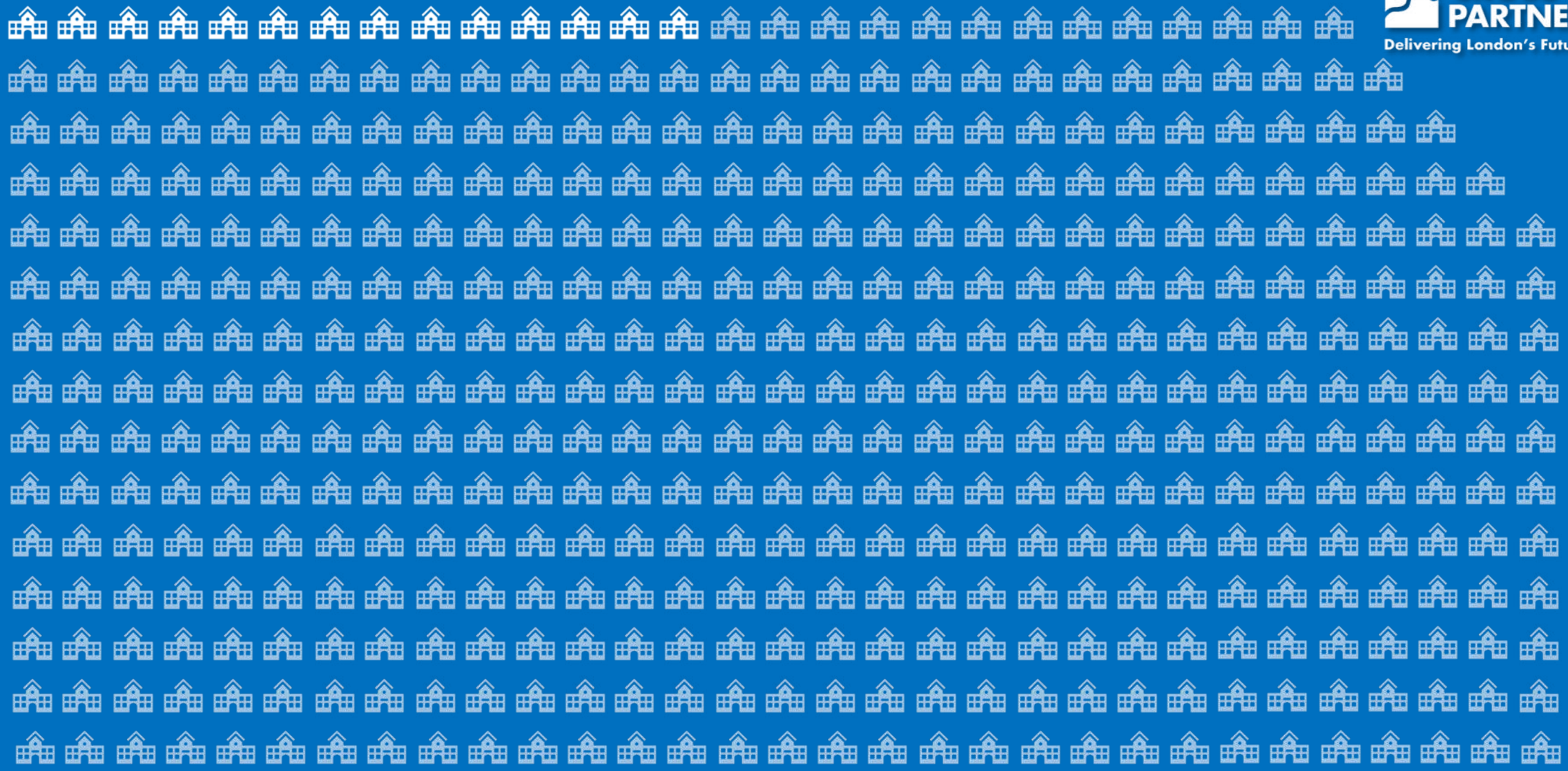

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# 14 in 2019

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# 99%

## of London still exceeds WHO limits

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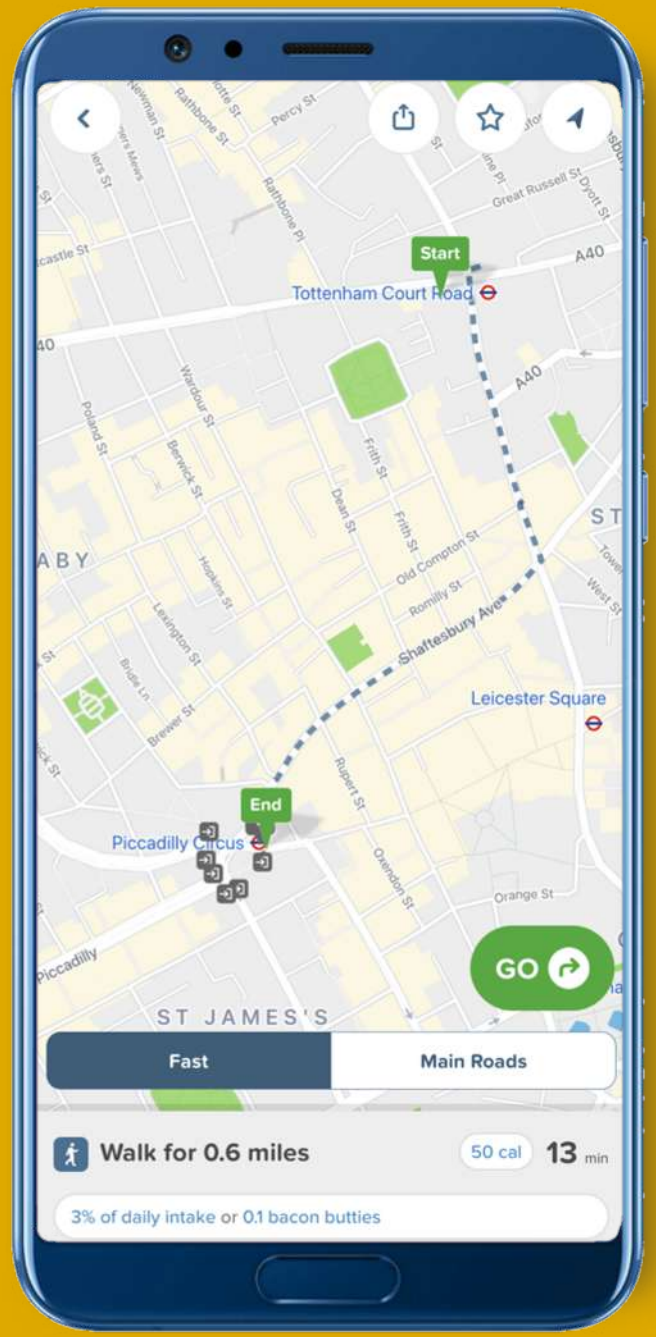


Screenshot from Citymapper, version 10.24.

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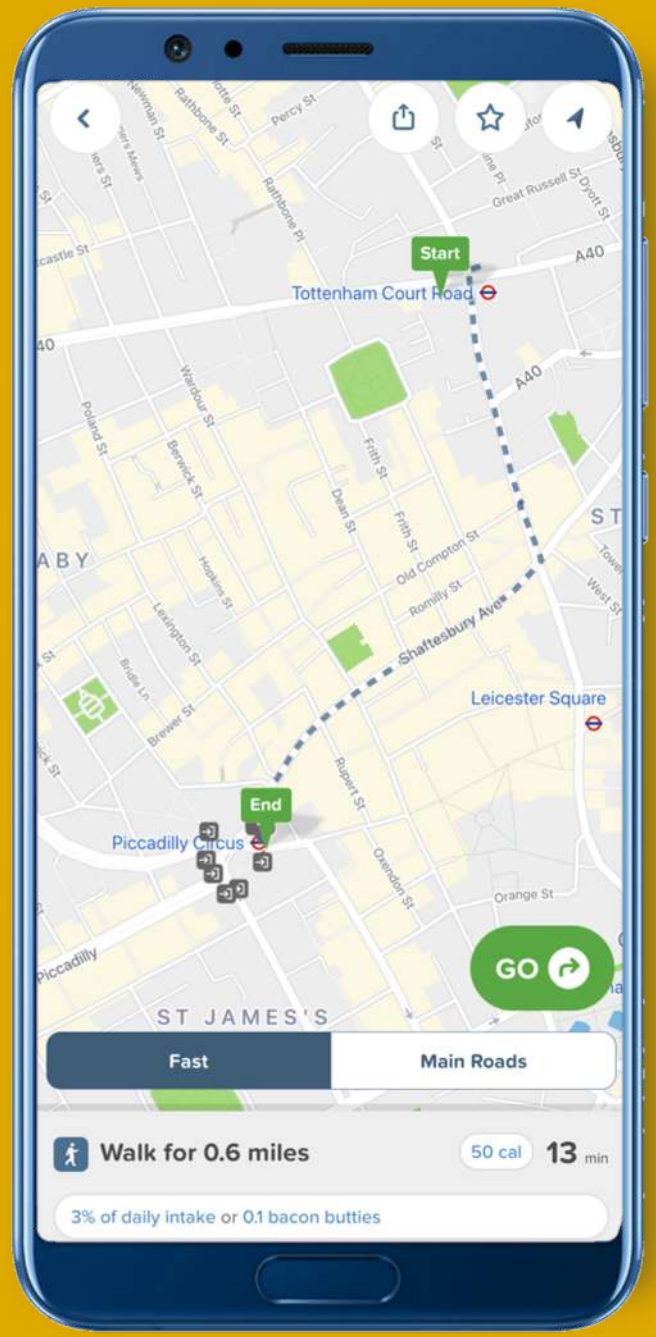
# The problem with journey planners




Screenshot from Citymapper, version 10.24.

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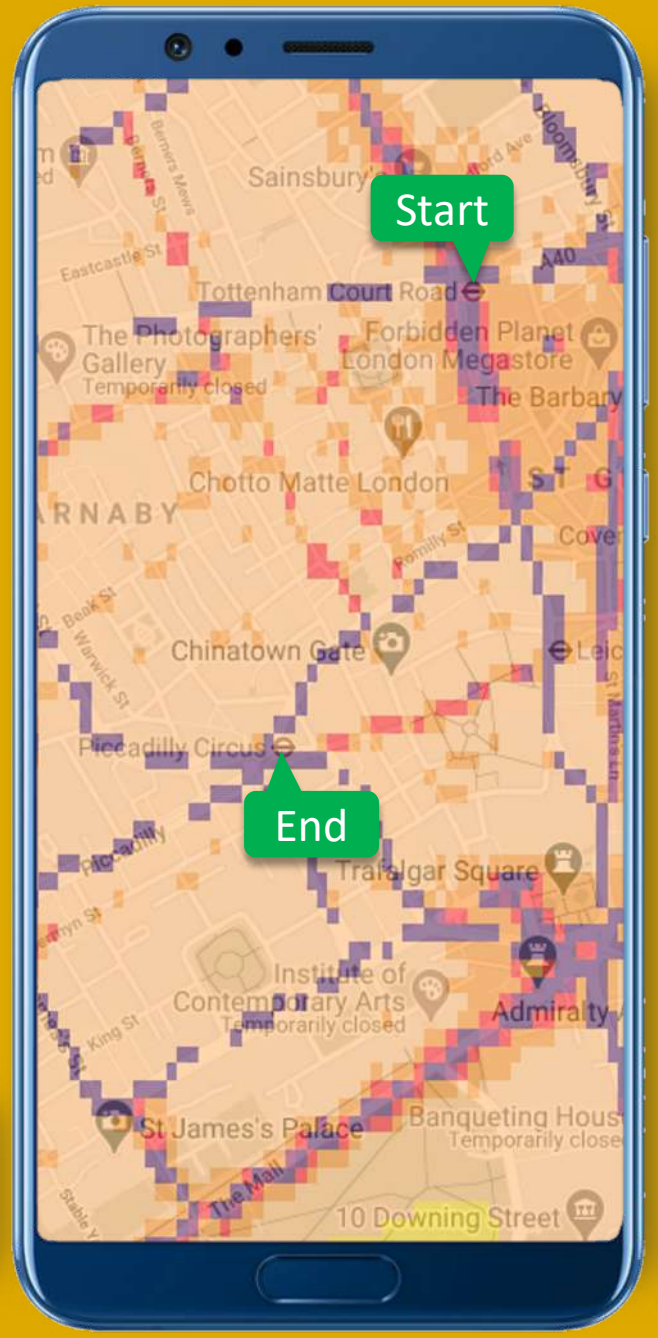
# The problem with journey planners




Key: Annual mean NO2 air pollution for 2016, in microgrammes per metre cubed (ug/m3)

<16 16 19 22 25 28 31 34 37 40 43 46 49 52 55 >58

Screenshot from LondonAir website, modelled annual mean NO2 map.

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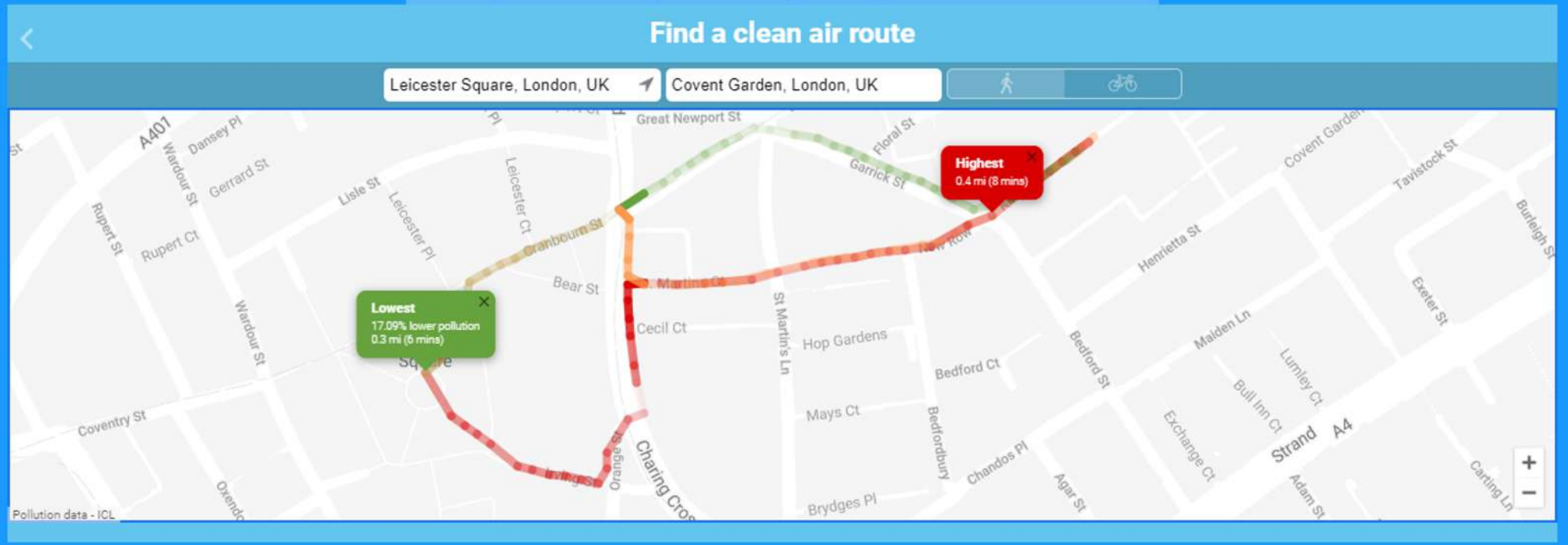
# Clean Air Route Finder

Some streets have cleaner air than others. Reduce your exposure to air pollution by taking a clean air route.

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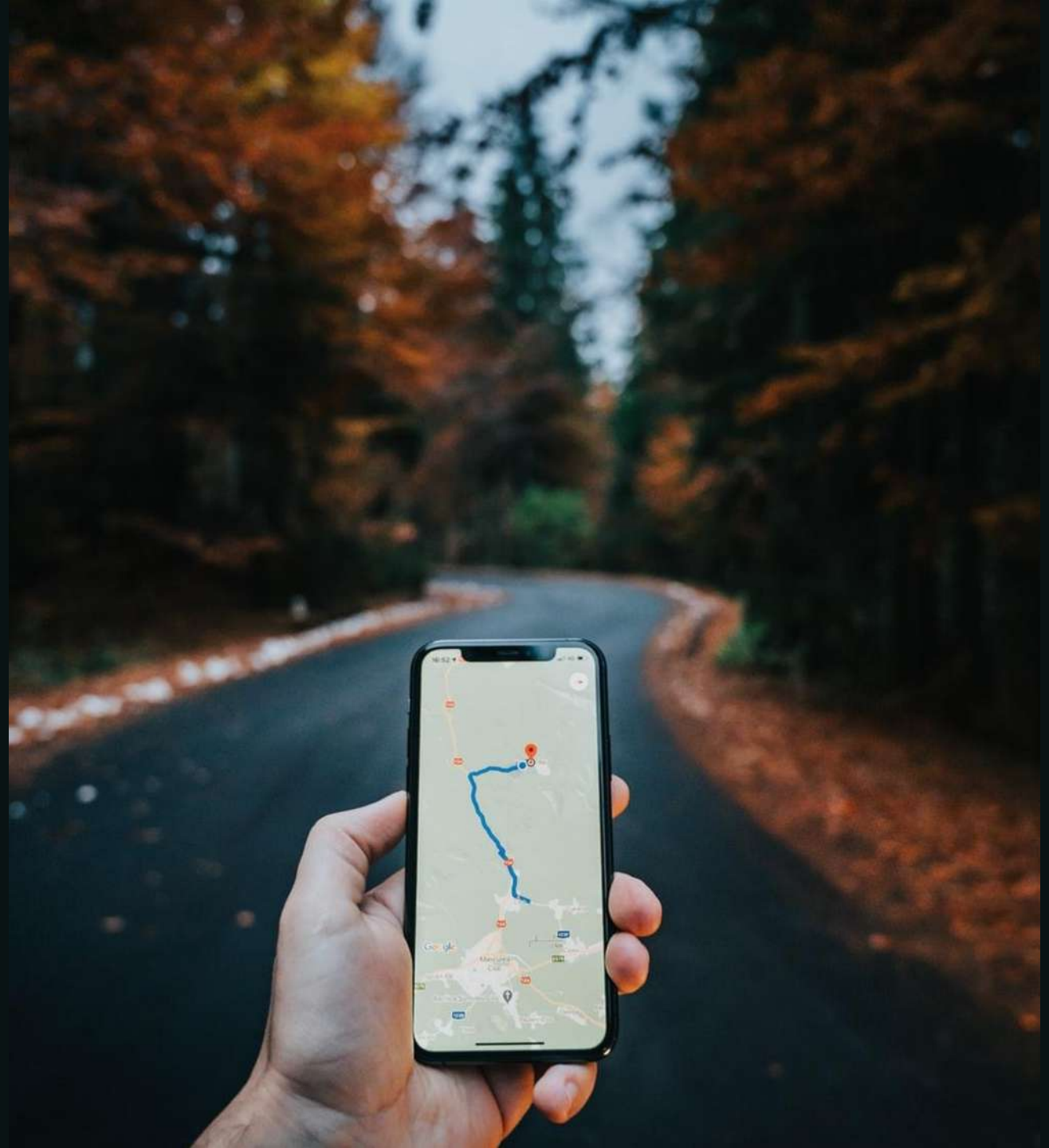

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# Tranquil City

Tranquil City

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**We are an environmental data company whose mission is to provide empowering and actionable information so that everybody can lead a healthy life.**

Tranquil City

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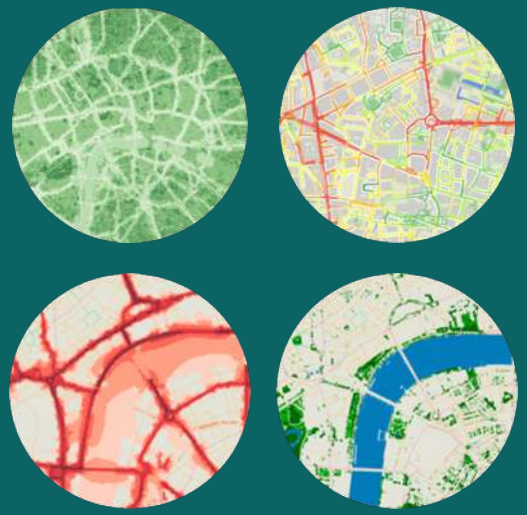
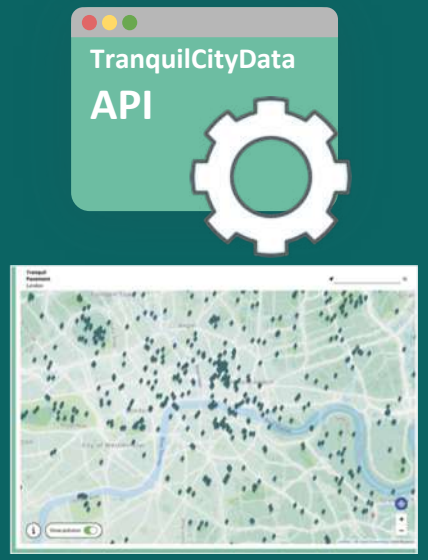
# What we do

**We curate environmental information into digital tools so that it can be used in apps and technologies that people use everyday**

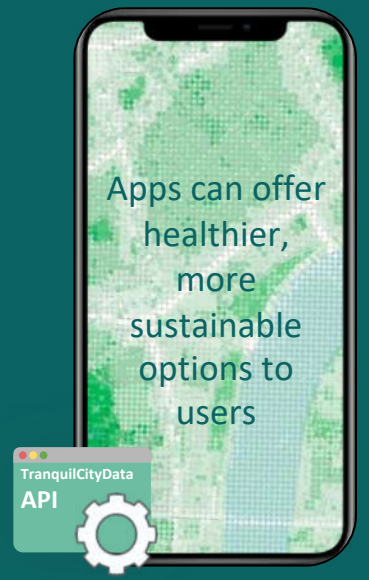
## Expert Data Toolkits



## Digital Tools




## Easy to access

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# Our Community


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ITV NEWS LONDON · Time Out London · BBC NEWS · London Evening Standard · METRO

# Clean Air Walking Routes project

The challenge

- **To accurately monitor the most relevant pollutants to human health.**
- **To present the air quality benefits in a way that is easily understandable, engaging and encourages people to use the routes.**
- **To further encourage route uptake by promoting other environmental and streetscape factors that impact active travel.**

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# Which pollutants did we measure?

Nitrogen Dioxide ($NO_2$)

Particulate Matter ($PM_{2.5}$)

Particulate Matter ($PM_{10}$)

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# Monitors

## Aeroqual Series 500 Handheld Monitors


Aeroqual $NO_2$ and $O_3$ sensor heads


Aeroqual $NO_2$ and $O_3$ sensor heads


Aeroqual PM2.5 and PM10 sensor head

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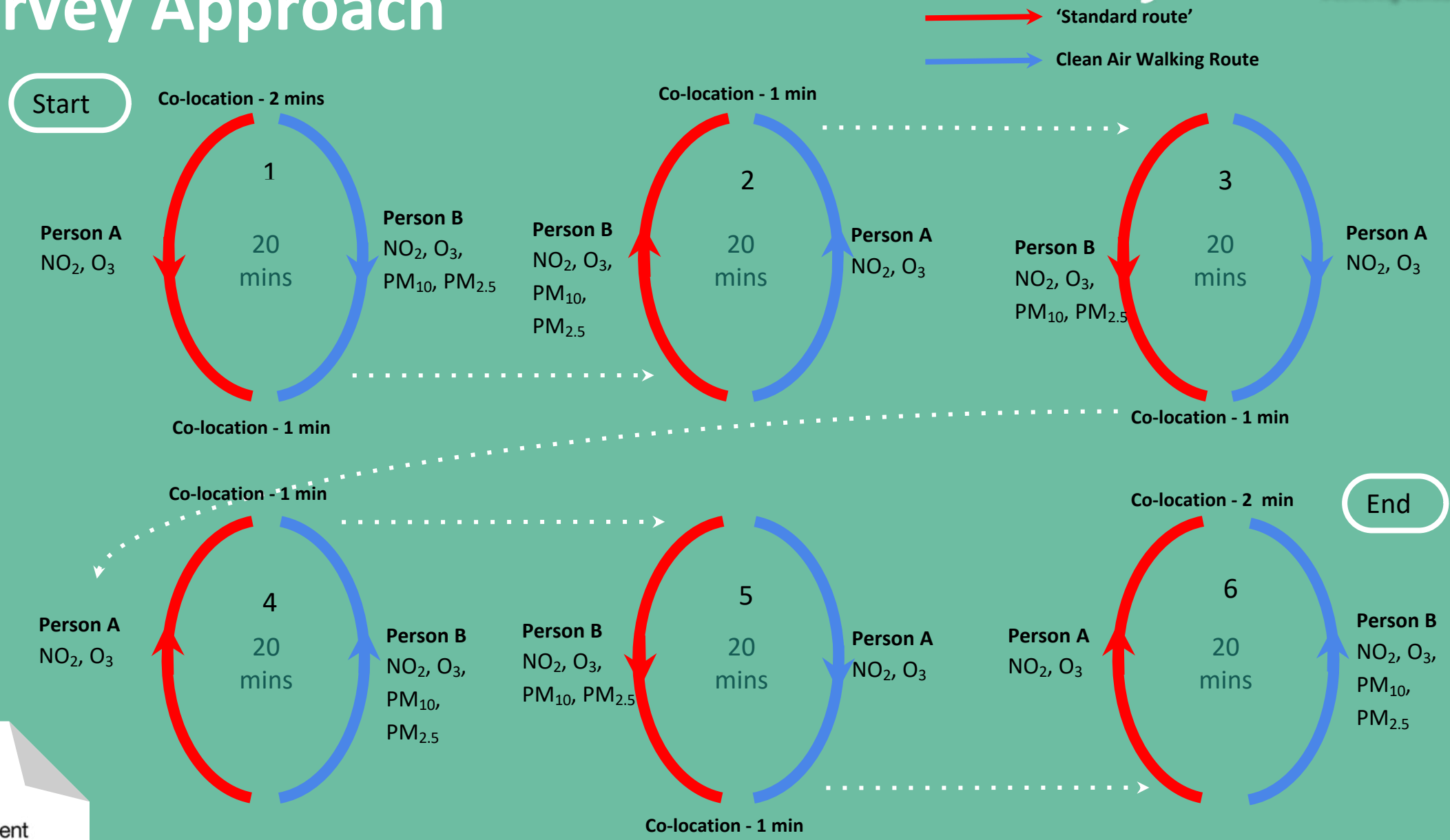
# Survey Approach



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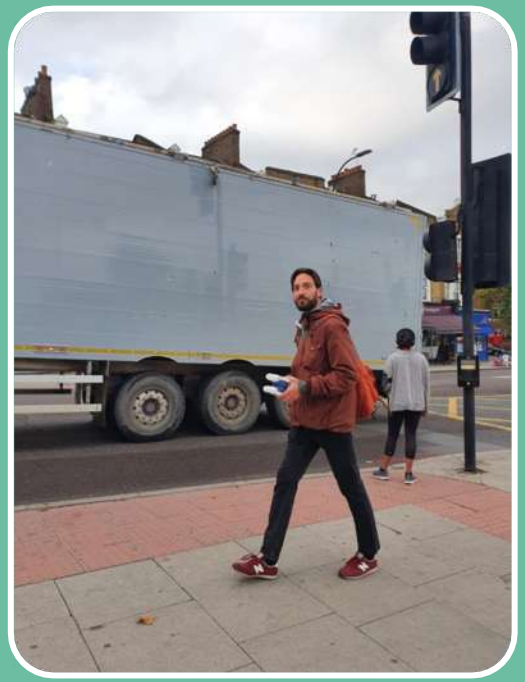
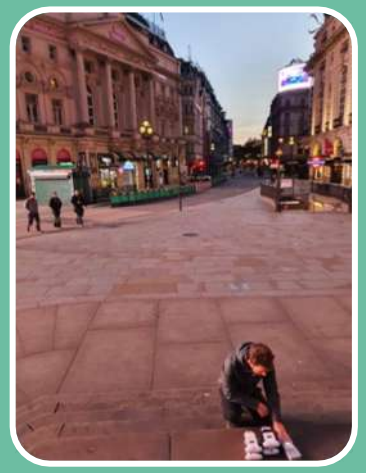
# Monitoring




- 15 route pairs
- 1st October to 22nd October 2020
- Morning peak period (06:30-09:30)
- Evening peak period (16:30-19:00)
- Simultaneous monitoring $NO_2$ & $O_3$
- Each route pair was walked 6 times



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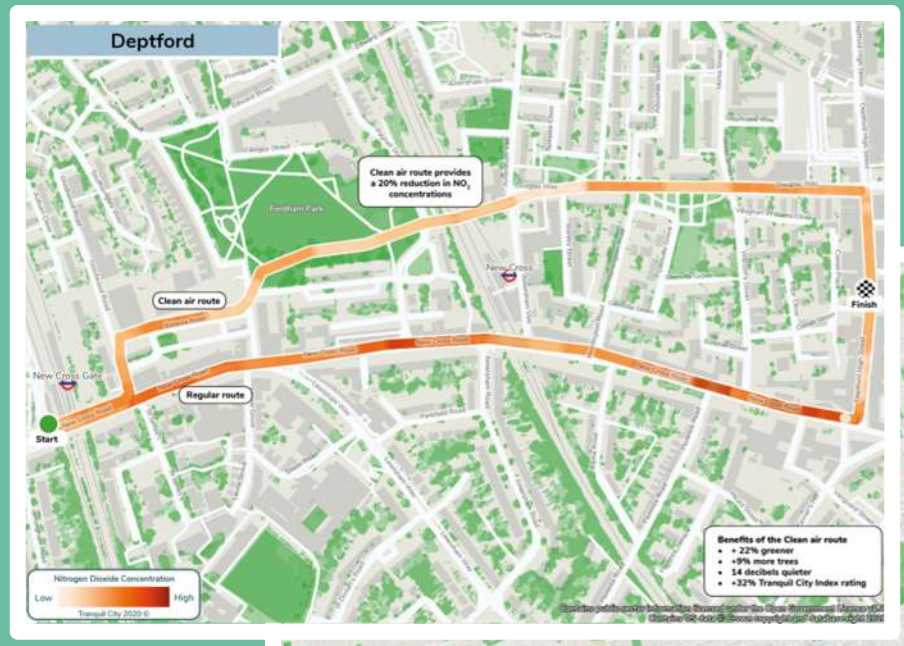
# Analysis

1. Data download.
2. Calculation of '$NO_2$' value.
3. Co-location comparison & applying adjustment factors.
4. Calculate the $NO_2$, $PM_{2.5}$ & $PM_{10}$.
5. Calculate reduction in exposure between CAWR and Regular.
6. Product time history graphs.
7. GIS mapping of each route pair.
8. Calculation of additional environmental benefits.

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# Overarching Results

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| Location | Additional journey time for Clean route | $NO_2$ average percentage benefit | $NO_2$ max. percentage benefit | $NO_2$ benefit Max. (ppm) | $NO_2$ benefit Max. ($\mu g/m^3$) | Other environmental benefits |
|---|---|---|---|---|---|---|
| Angel | 3 min (cycling) | 6% | 17% | 0.0149 | 29 | 13 dB less noise, 18% better on Tranquil City Index, 8% better on Healthy Streets Index |
| Camberwell | 4 min | 10% | 29% | 0.0131 | 25 | 15 dB less noise, 3% more green space, 2% more tree cover, 17% better on Tranquil City Index, 10% better on Healthy Streets Index |
| City of London | 4 min | 13% | 28% | 0.0121 | 23 | 15 dB less noise, 20% better on Tranquil City Index, 9% better on Healthy Streets Index |
| Cromwell Road | 2 min | -6% | 7% | 0.0040 | 8 | 15 dB less noise, 15% better on Tranquil City Index, 1% better on Healthy Streets Index |
| Deptford | 2 min | 20% | 32% | 0.0185 | 35 | 15 dB less noise, 21% more green space, 7% more tree cover, 31% better on Tranquil City Index, 13% better on Healthy Streets Index |
| Fitzrovia | 1 min faster | 11% | 23% | 0.0165 | 32 | 13 dB less noise, 8% more green space, 8% more tree cover, 19% better on Tranquil City Index, 12% better on Healthy Streets Index |
| Great Ormond Street Hospital | 1 min faster | 11% | 18% | 0.0104 | 20 | 6 dB less noise, 4% more green space, 2% more tree cover, 9% better on Tranquil City Index, 3% better on Healthy Streets Index |
| Holloway Road | 1 min | 13% | 25% | 0.0097 | 19 | 9 dB less noise, 11% better on Tranquil City Index, 6% better on Healthy Streets Index |
| Richmond | 3 min | 23% | 30% | 0.0207 | 40 | 10 dB less noise, 28% more green space, 9% more blue space, 10% more tree cover, 30% better on Tranquil City Index, 14% better on Healthy Streets Index |
| Seven Sisters | 3 min | 16% | 37% | 0.0307 | 59 | 9 dB less noise, 13% better on Tranquil City Index, 13% better on Healthy Streets Index |
| Shepherds Bush | 2 min | 18% | 30% | 0.0222 | 42 | 15 dB less noise, 6% more green space, +1 water features, 7% more tree cover, 24% better on Tranquil City Index, 9% better on Healthy Streets Index |
| Soho | 4 min | 15% | 26% | 0.0204 | 39 | 16 dB less noise, 1% more green space, 1% more tree cover, 23% better on Tranquil City Index, 4% better on Healthy Streets Index |
| South Bank (St Thomas') | 1 min | 26% | 36% | 0.0245 | 47 | 9 dB less noise, 11% better on Tranquil City Index, 4% better on Healthy Streets Index |
| South Bank (Oxo Tower) | 3 min | 19% | 26% | 0.0133 | 26 | 19% more blue space, 5% more tree cover, 7% better on Tranquil City Index, 3% better on Healthy Streets Index |
| Tooting | 0 mins | 14% | 38% | 0.0303 | 58 | 6 dB less noise, 8% better on Tranquil City Index |
| Wimbledon | 1 min | 23% | 41% | 0.0273 | 52 | 15 dB less noise, 10% more green space, 6% more tree cover, 27% better on Tranquil City Index, 8% better on Healthy Streets Index |

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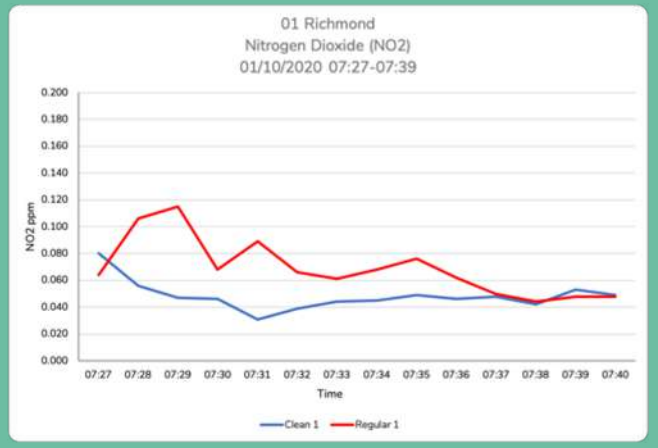
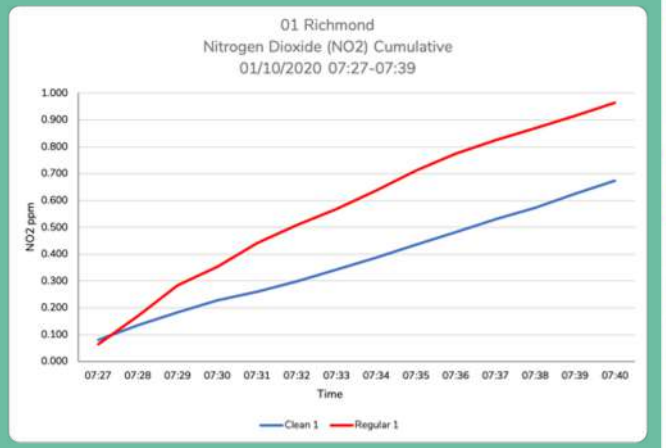
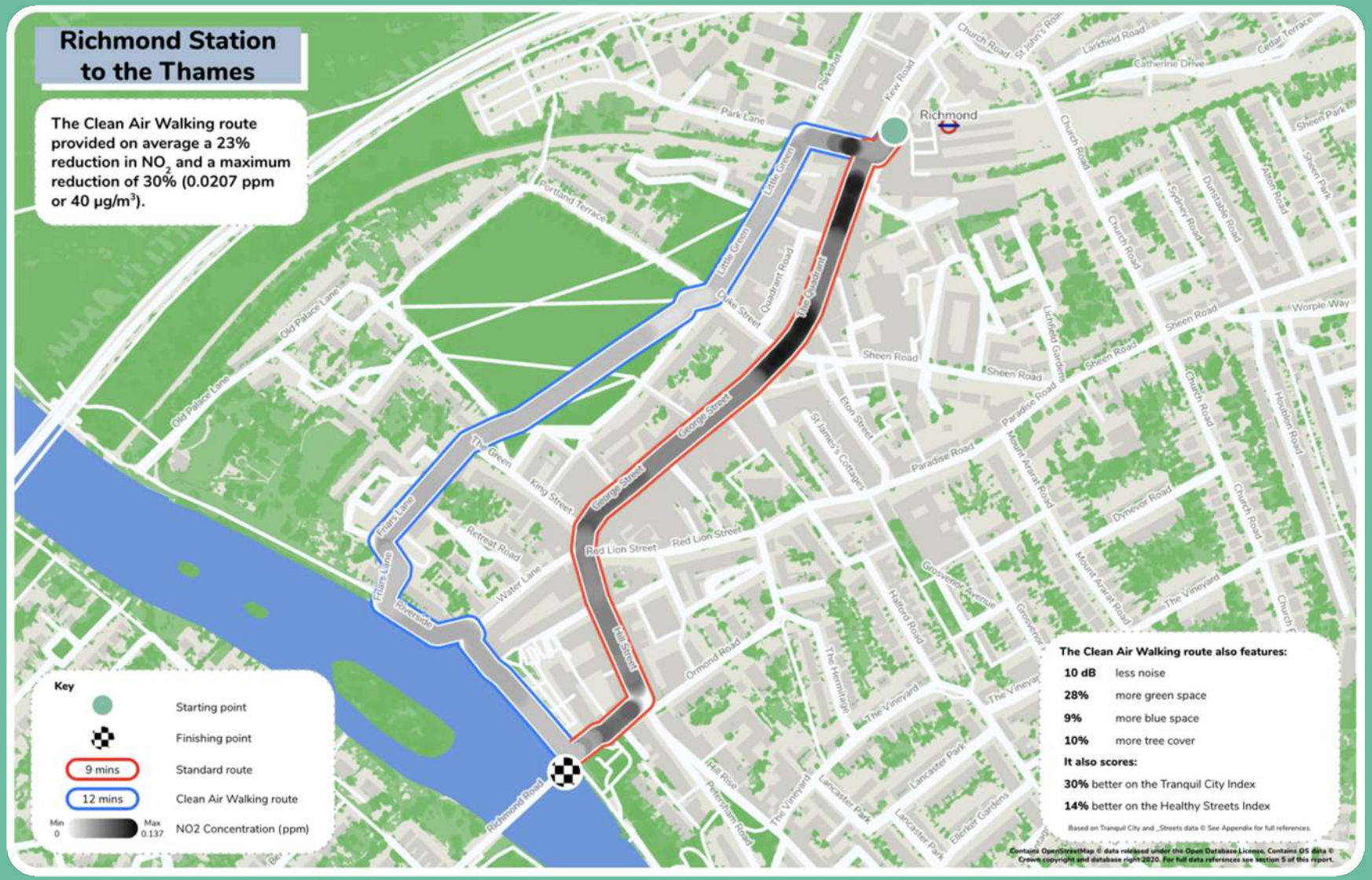
# Richmond ($NO_2$)

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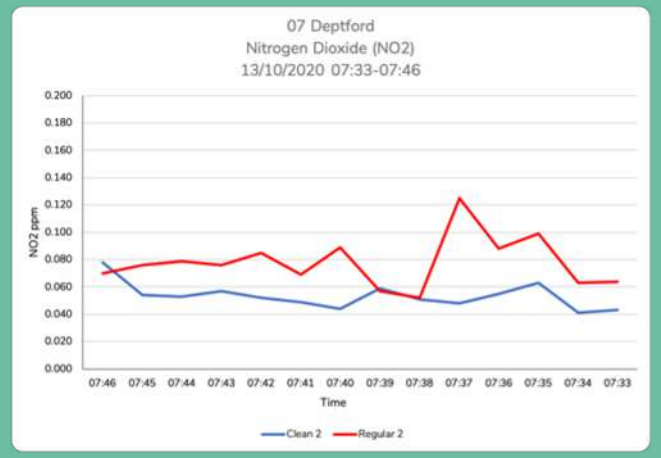
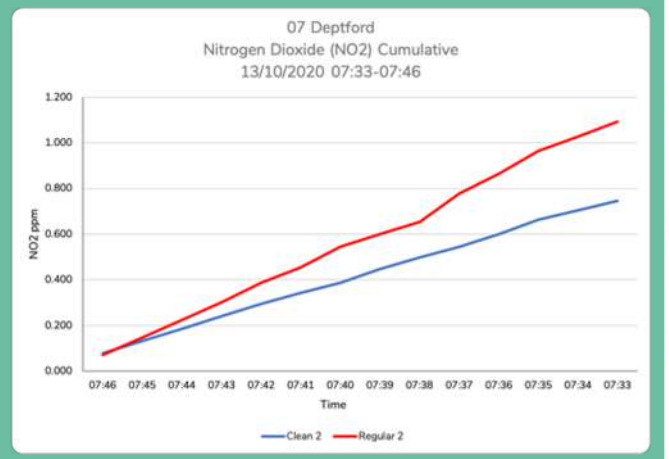
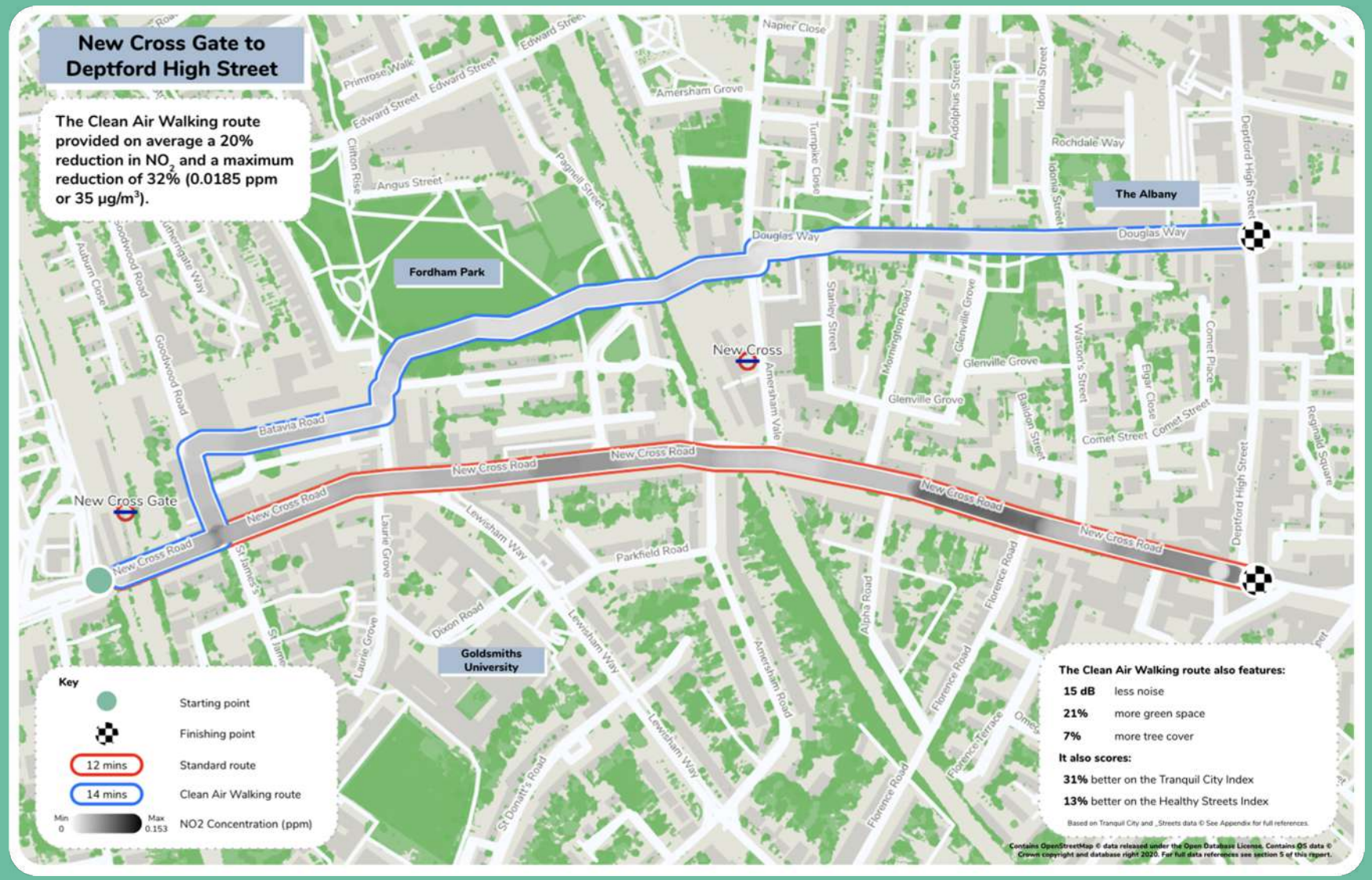
# Deptford ($NO_2$)

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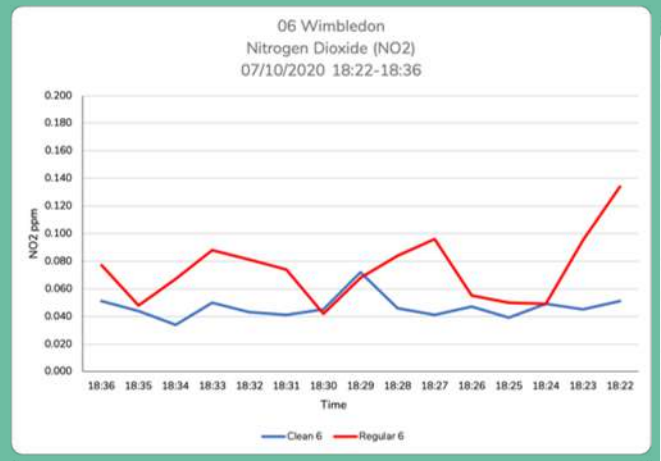
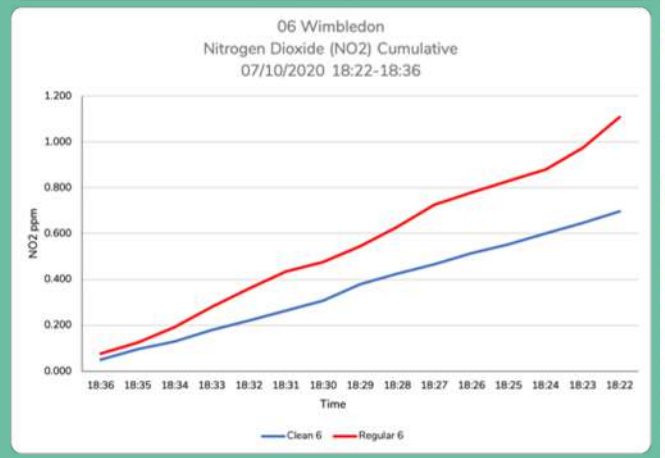
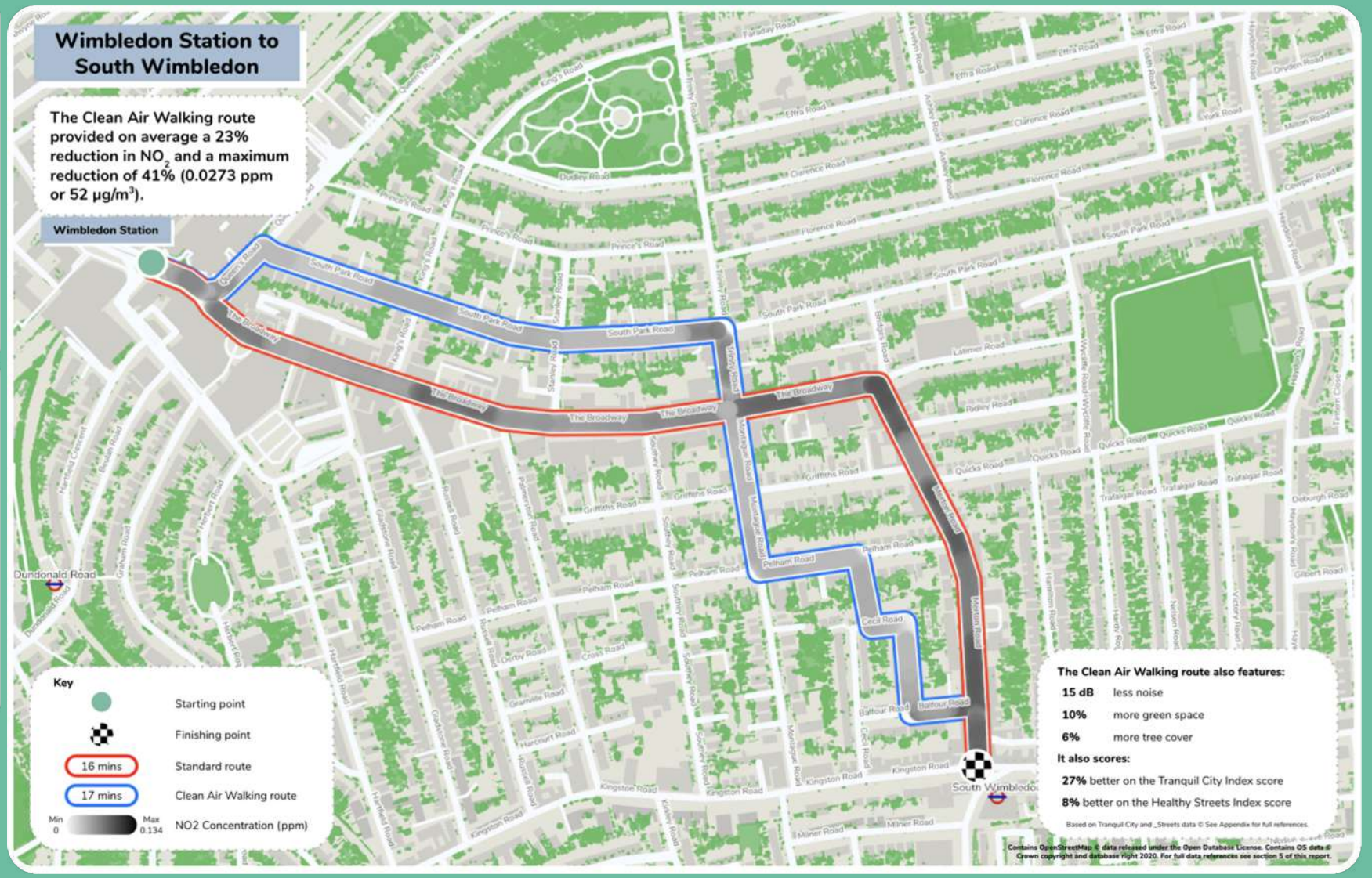
# Wimbledon ($NO_2$)

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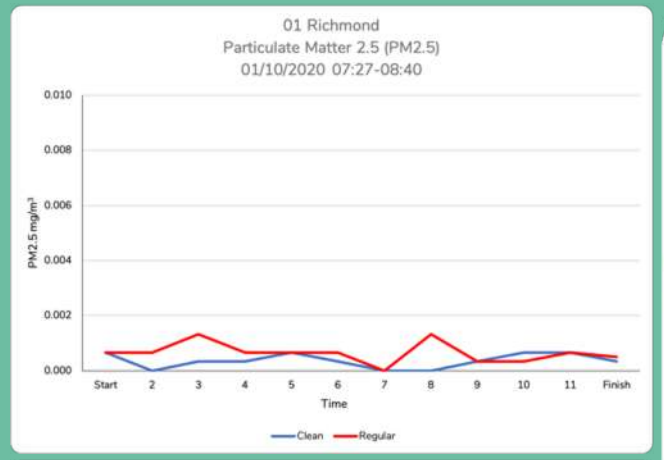
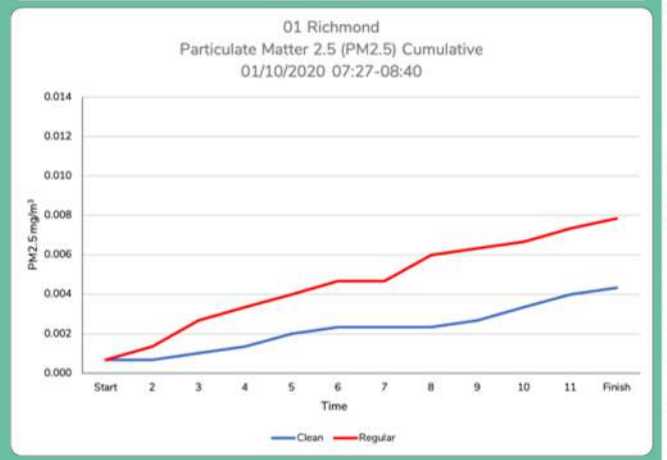
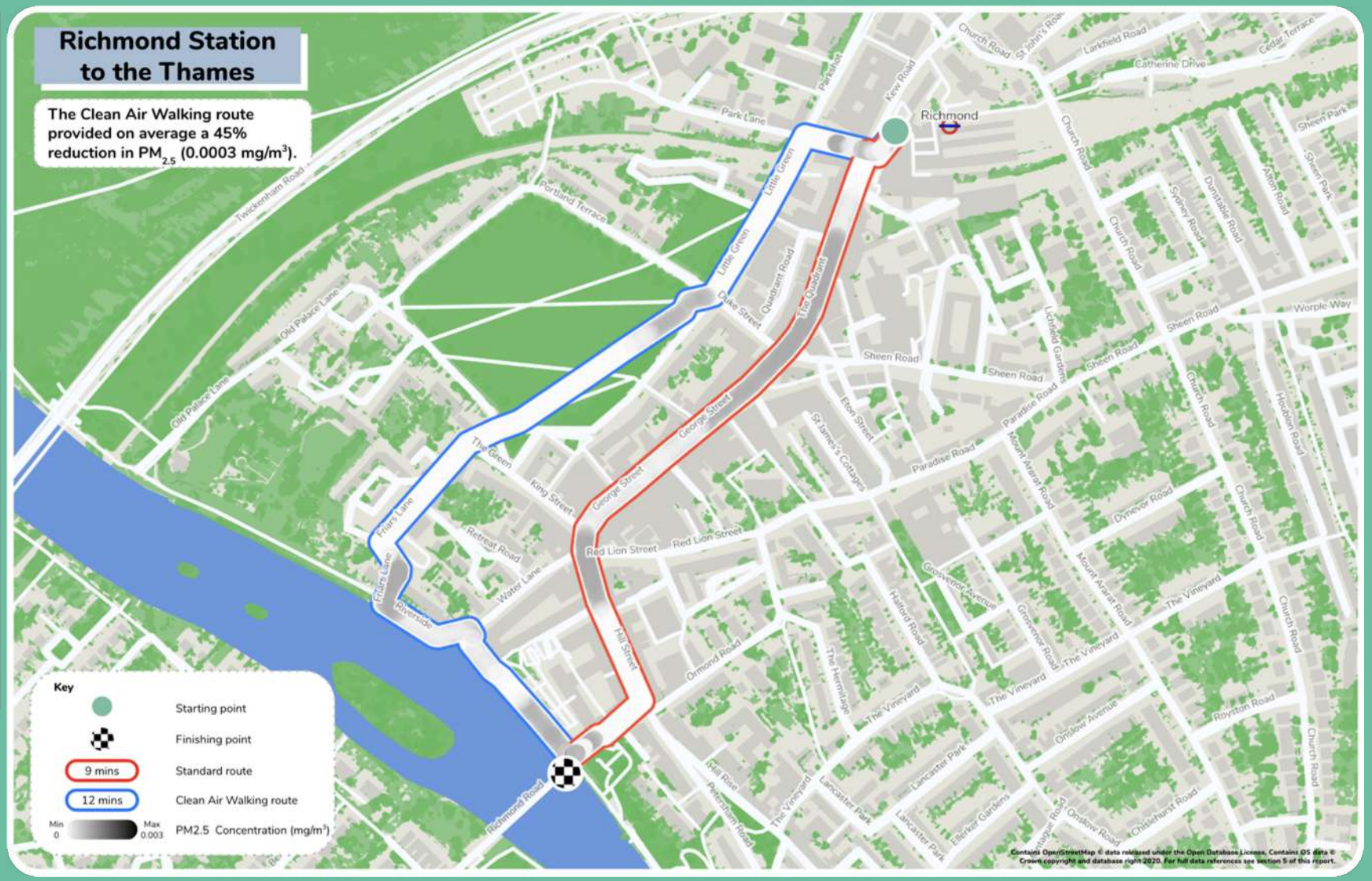
# Richmond ($PM_{2.5}$)

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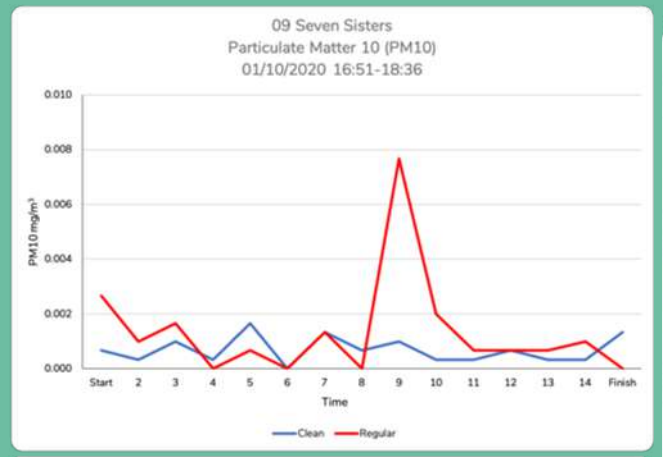
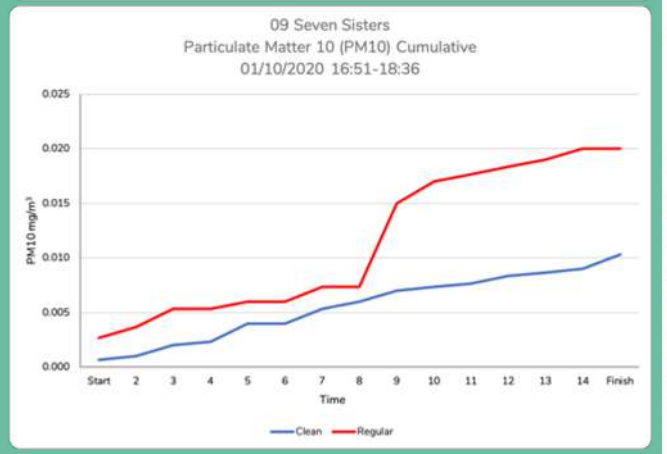
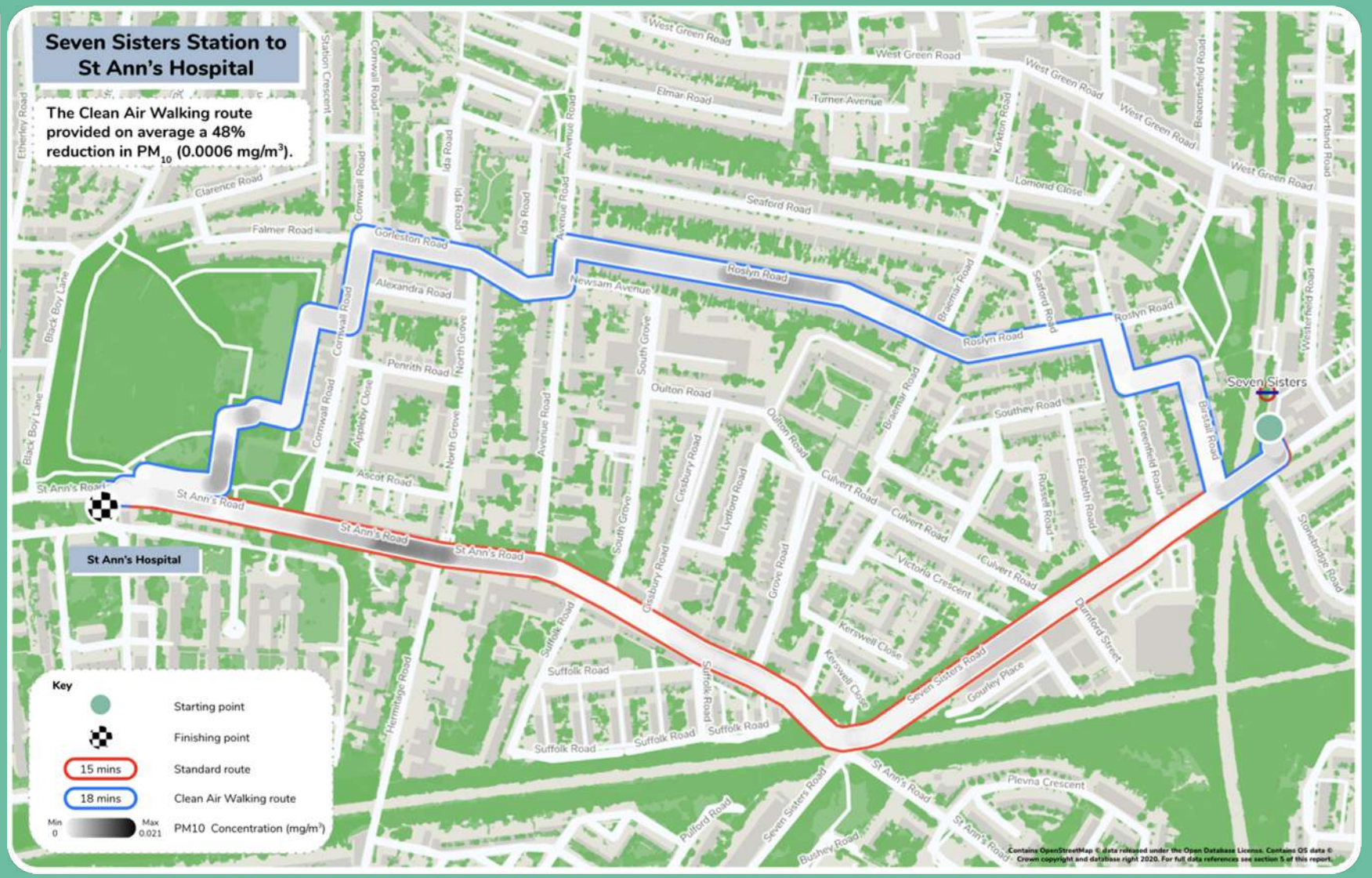
# Seven Sisters ($PM_{10}$)

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# Other environmental benefits

The Clean Air Walking route also features:

| | |
|---|---|
| 15 dB | less noise |
| 6% | more green space |
| +1 | water features |
| 7% | more tree cover |

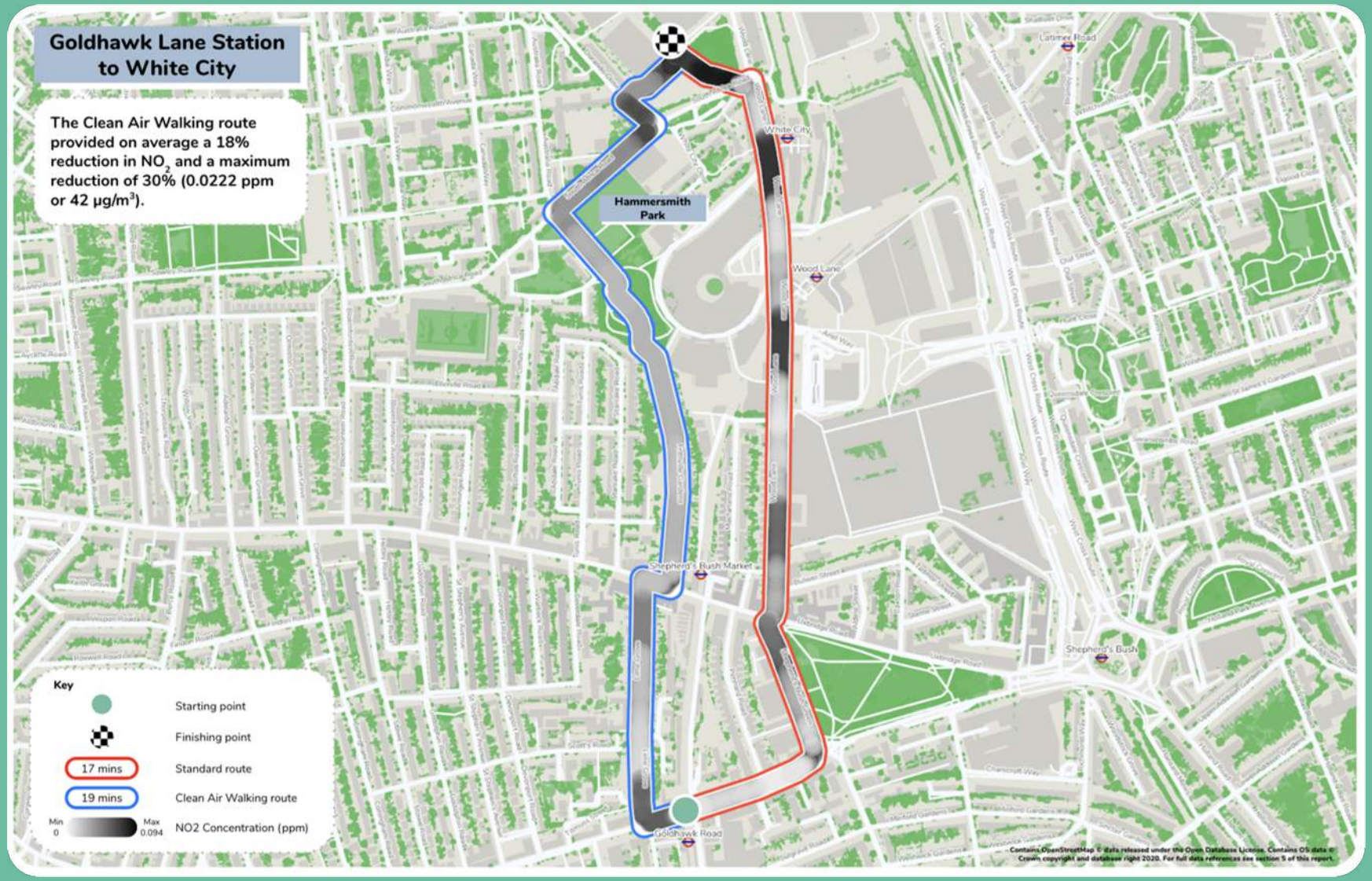
It also scores:

24% better on the Tranquil City Index score

9% better on the Healthy Streets Index score

Based on Tranquil City and _Streets data © See Appendix for full references.

- Reduced noise levels.
- Up to 28% more greenery.
- Up to 10% more tree cover.
- Up to 14% higher Healthy Streets Index performance.

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# Conclusions

- Average $NO_2$ benefit for Clean Air Walking Routes ranged 6% to 23%.
- Maximum $NO_2$ benefit was up to 30-40%.
- Due to low levels of particulate matter, results were not conclusive.
- However, it is considered that particulate exposure on CAWRs is lower.
- Reductions in air pollution exposure alone is not sufficient to encourage sustained behaviour change towards walking and cycling.
- Environmental and street quality comparisons were made and routes showed notable benefits in environmental quality (noise, greenspace, tree cover, water elements) and the majority of routes showed a notable benefit in street quality (Healthy Streets Index).

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2020

Sep

Identifying routes

Oct

Monitoring

Nov

Analysis
Final report

Dec

LiveShare

2021

Jan

Wider promotion

Feb

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Until every London street has clean and healthy air, we need to be smart about the choices we make each day.

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# Questions?

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# Final Observations

GUY'S & ST THOMAS' CHARITY

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# The Future Functionality and Potential of London's Centres

## Join us for our next LiveShare session!

**Thursday 17th December 2pm**

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# Thank You!

Matt Towner
Portfolio Manager
Guy's & St Thomas' Charity
Matt.towner@gsttcharity.org.uk

Grant Waters
CEO & Acoustician
Tranquil City
grant@tranquilcity.co.uk

Ben Warren
COO & Air Quality Expert
Tranquil City
ben@tranquilcity.co.uk

Abby McDougall
Technical Project Officer
Cross River Partnership
abbymcdougall@crossriverpartnership.org

Tomos Joyce
Guidance Manager
Cross River Partnership
tomosjoyce@crossriverpartnership.org

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