UNIVERSITY OF BIRMINGHAM

WM-NET ZERO

A Health-centred Systems Approach Towards Net-Zero: Transforming Regional Climate Mitigation Policies

WM ADAPT

Launch Webinar

Climate-Health Explorer

Evidence I Insight I Action

4th June 2025

www.climatehealth-explorer.org.uk

The WM-NetZero project is supported by Wellcome Trust (227150_Z_23_Z) under the *Advancing climate mitigation policy solutions with health co-benefits in G7 countries* scheme.

Natural Environment Research Council

Climate-Health Explorer

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Opening Remarks

Chair

Christopher Hammond

Chief Executive

UK100

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Webinar Agenda

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Time	Item	Person
10:00	**Opening remarks**	Chair: Christopher Hammond, UK100
10:05	**Overview**	Dr Suzanne Bartington, University Birmingham
10:10	**Decarbonising transport in the West Midlands**	Andy Poole, Transport for West Midlands
10:20	**Regional engagement**	Sally James, Birmingham City Council
10:30	**Public perspectives**	Derek Lambert and Fanniza Begum
10:40	**Climate-Health Explorer demonstration**	James Hall, University of Birmingham Sophie Morris: Sandwell Metropolitan Borough Council
11:00	**Panel Q&A**	Chair: Christopher Hammond, UK100
11:20	**Closing remarks**	Zongbo Shi: University of Birmingham
11:30	**Close**	Chair: Christopher Hammond, UK100

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WM-Net Zero overview

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Dr Suzanne Bartington

Clinical Associate Professor in Environmental Health

University of Birmingham

Co-Lead WM-Net Zero

Aims of the Climate Health Explorer

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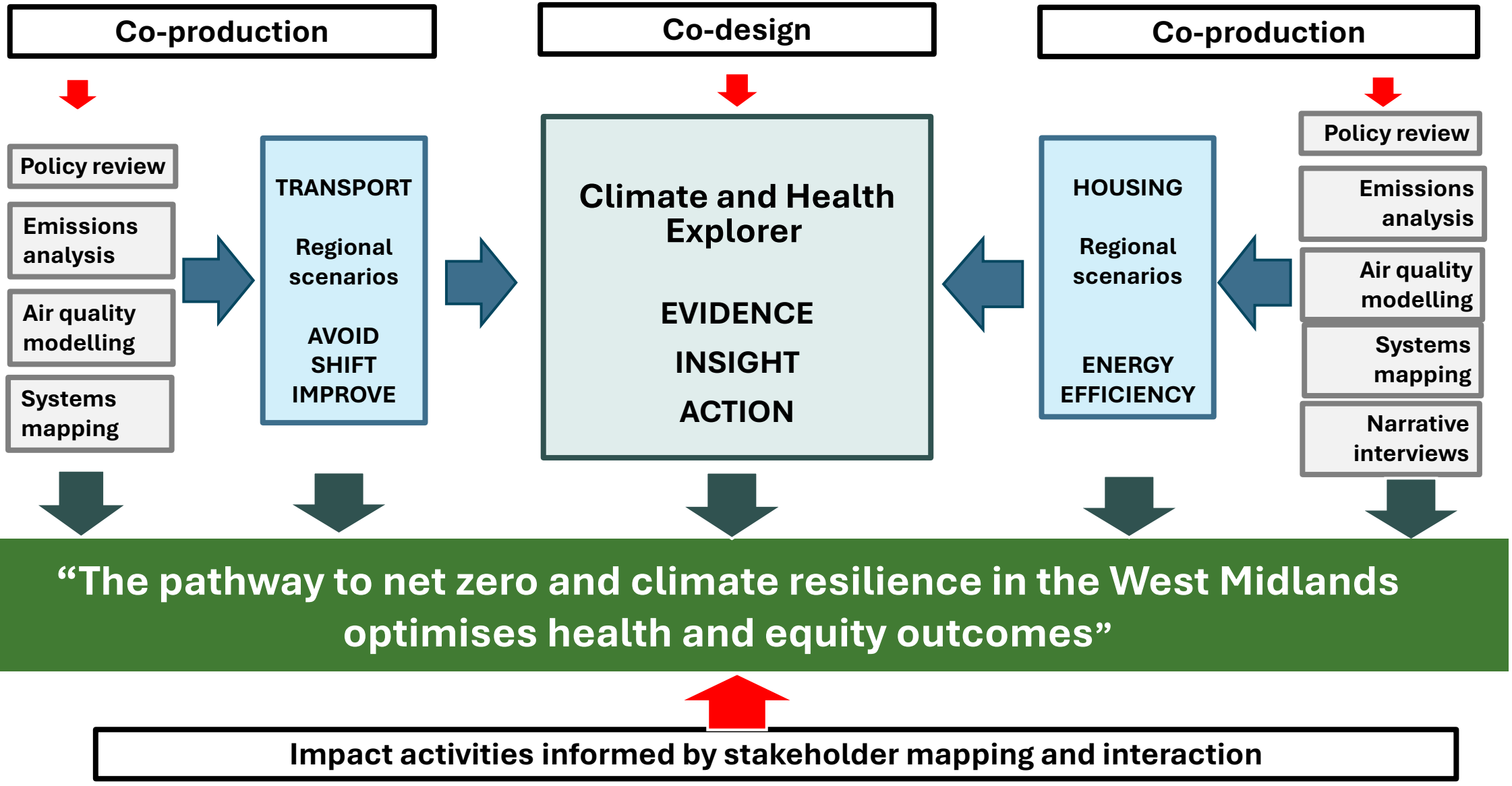
- Support **evidence-based policy** decisions
- Promote a **whole-systems approach** to climate policy
- Increase **climate change and health** awareness

WM-Net Zero Theory of Change



Scale of the Net-Zero Challenge

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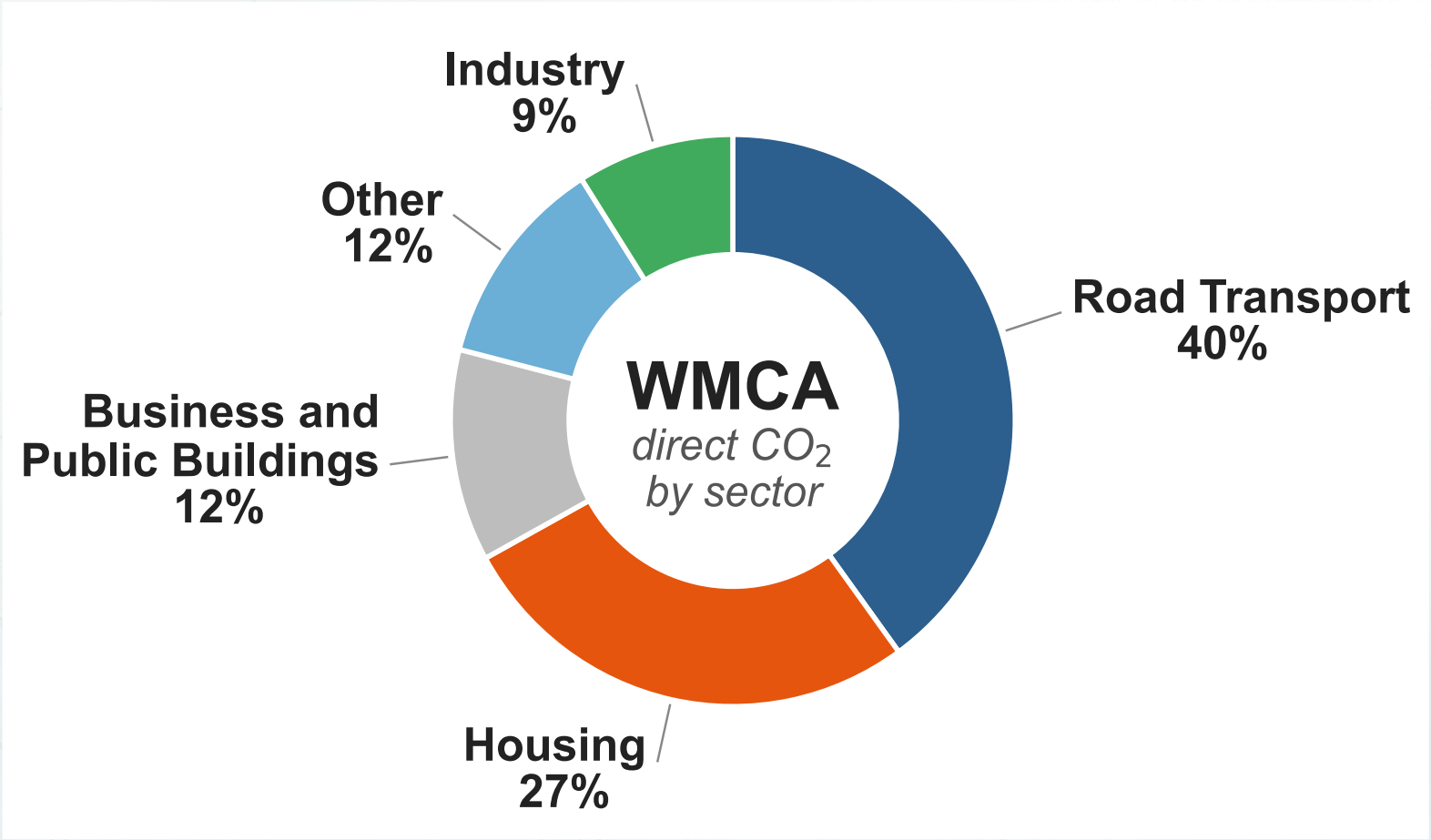

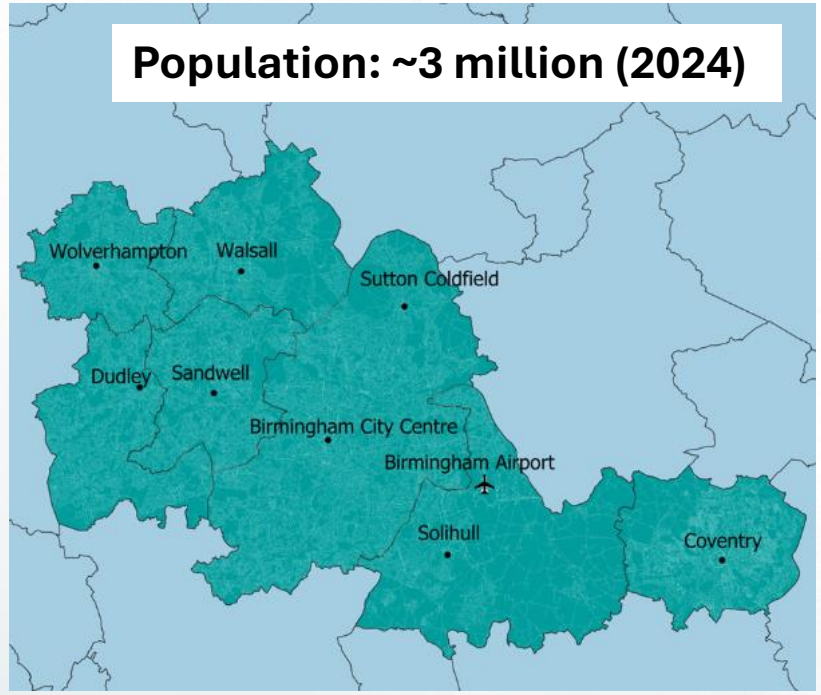

Other: *non-road transport and machinery, land use, agriculture, waste*

Total carbon dioxide emissions: 8.6 million tonnes (2024)

West Midlands Combined Authority

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Air pollution in 2024

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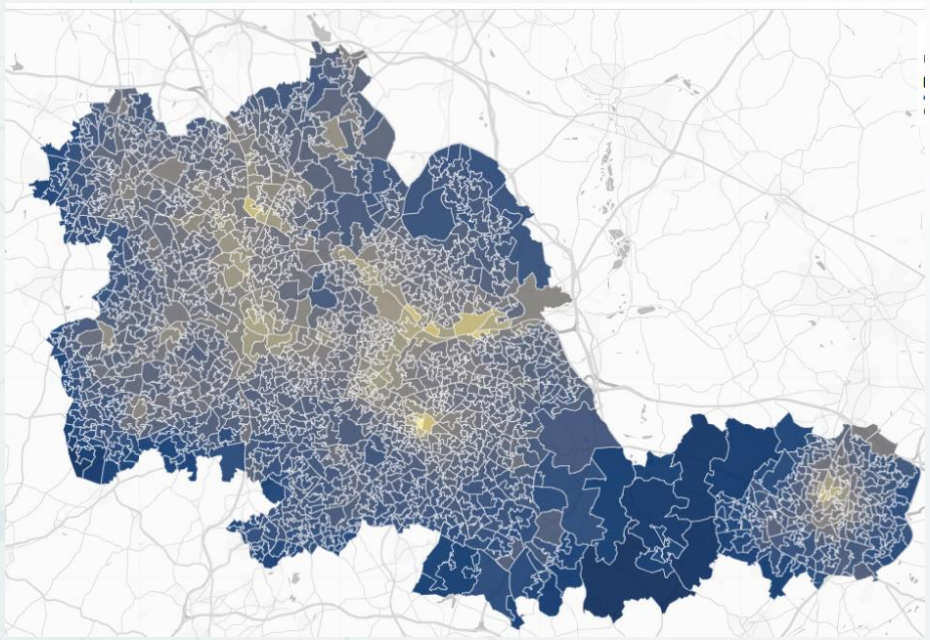

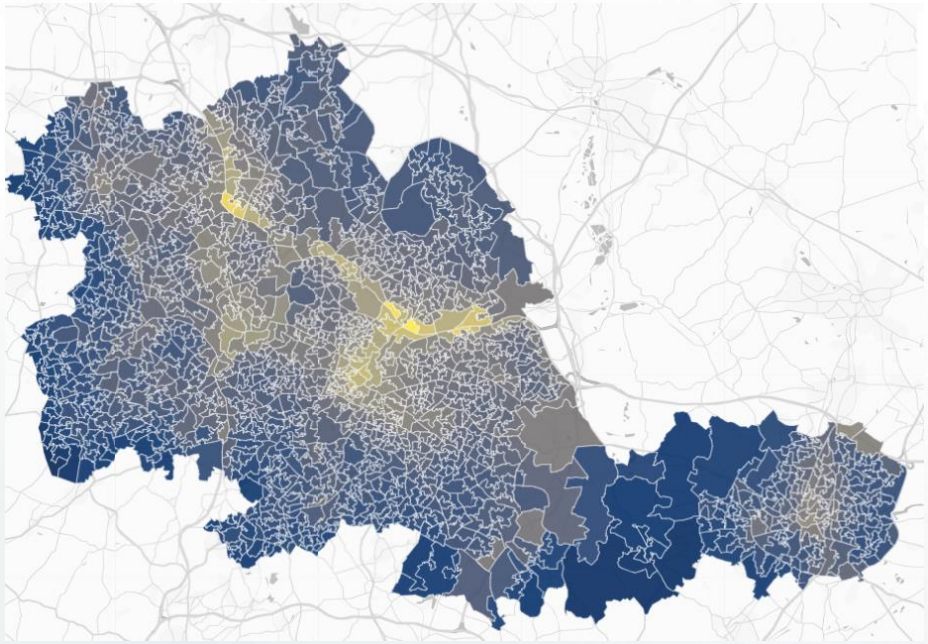

Annual average $PM_{2.5}$ = **7.6 µg/m³**

WHO Health Guideline = **5 µg/m³**

Annual average NO_2 = **14 µg/m³**

WHO Health Guideline = **10 µg/m³**

Most people experience **harmful air pollution levels**

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Noise pollution in 2024

Climate-Health Explorer

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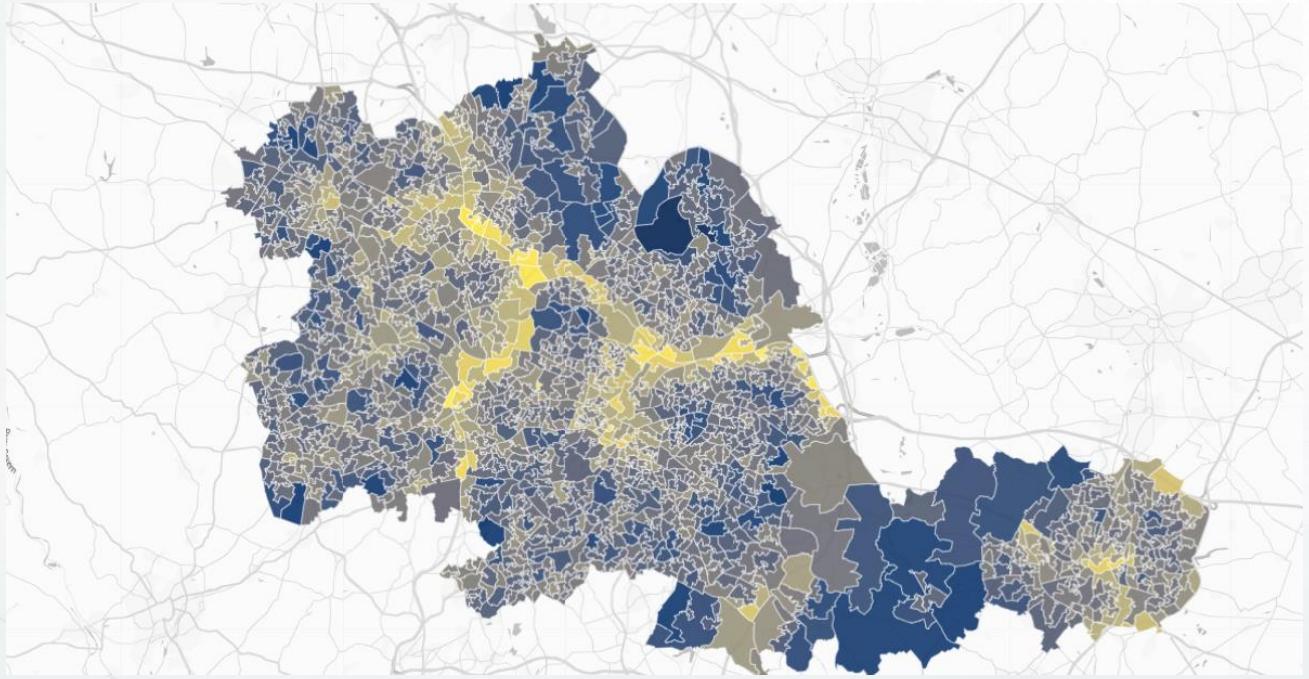

Annual Average Road Traffic Noise = **51 dB L_{den}**

WHO Health Guideline = **53 dB L_{den}**

1 in 4 people experience **harmful road noise**

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Physical Inactivity in 2024

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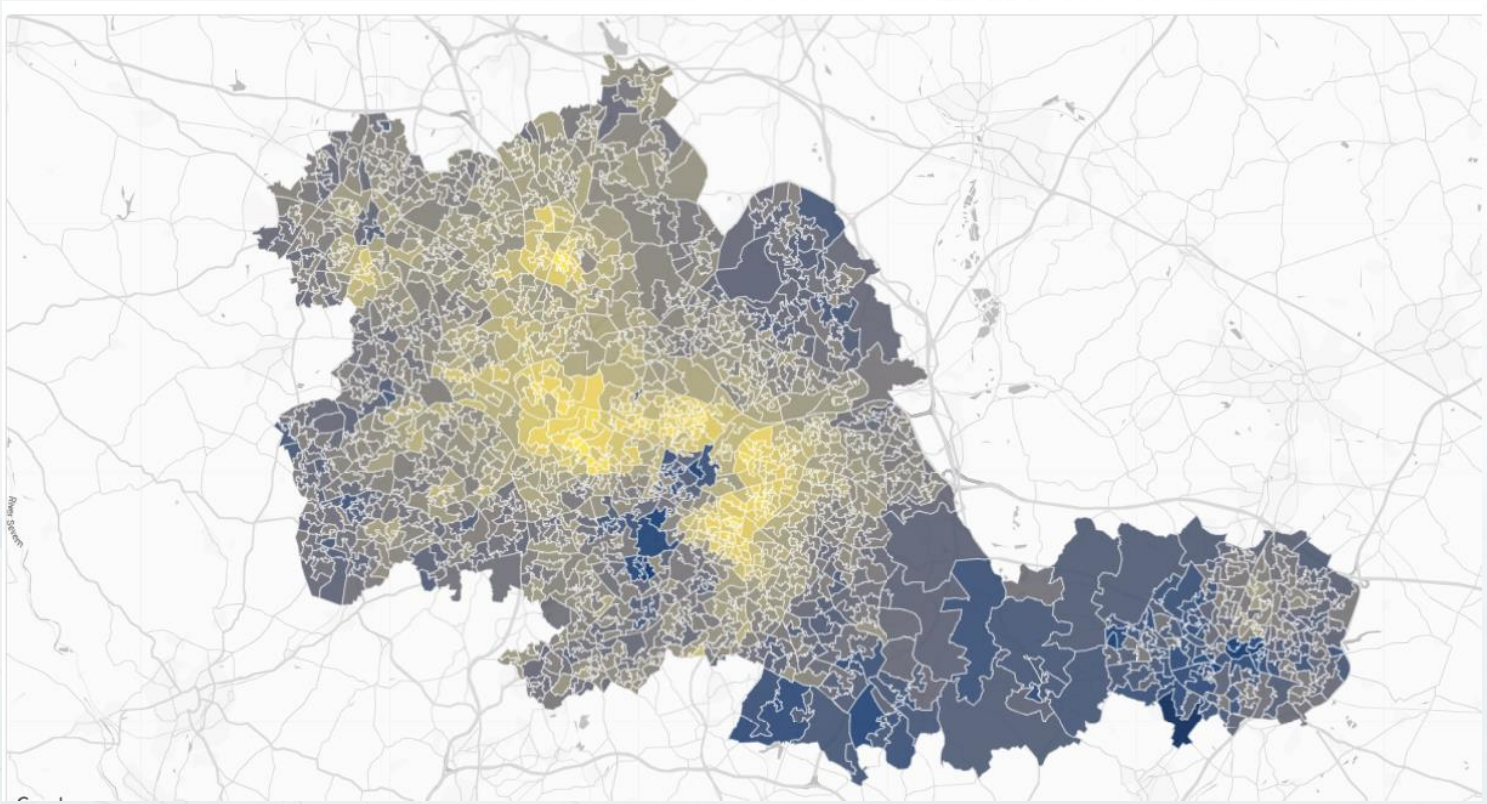

1 in 3 adults are **physically inactive**

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Transport for West Midlands

Journeys for Everyone

Transport Decarbonisation: Regional benefits
Climate Health Explorer Launch June 2026

Andy Poole, Decarbonisation Manager, TfWM Delivery Directorate

Transport for West Midlands

WMCA Inclusive Growth

[WMCA Inclusive Growth Fundamentals]

[West Midlands Growth Plan]

Transport for West Midlands

LTP Big Moves

- **Six thematic areas of region-wide policy built on the Core Strategies principles.**
- Provide a framework for the measures and actions that the region can take to improve and manage the transport system to deliver the LTP vision for travel enabling equitable economic growth
- Actions across the Big Moves are not taken in isolation and through developing programmes of activity, complimentary policies deliver the most effective outcomes.

Transport for West Midlands

- Local Transport Plan - Reimagining Transport in the West Midlands

Principles

Regardless of the pathway we take, there are five key principles we must embed in all action to reduce carbon emissions to maximise the benefits for our region:

- Fair and just transition
- Place-based transition
- Maximise wider social and economic outcomes
- Carbon reduction and climate adaptation
- Prioritise local influence

[West Midlands Climate Change Five Year Plan 2026-2031]

What is 1 tonne of CO2 in practical terms

- 2 typical trees, sequestering carbon over 60 years to maturity
- Around 1 year of typical private household use of an electric car
- Or 6 months in a typical petrol car
- 2 people switching from car to bike for 1 trip per day for 1 year
- **Around 1 month of emissions for average UK person**

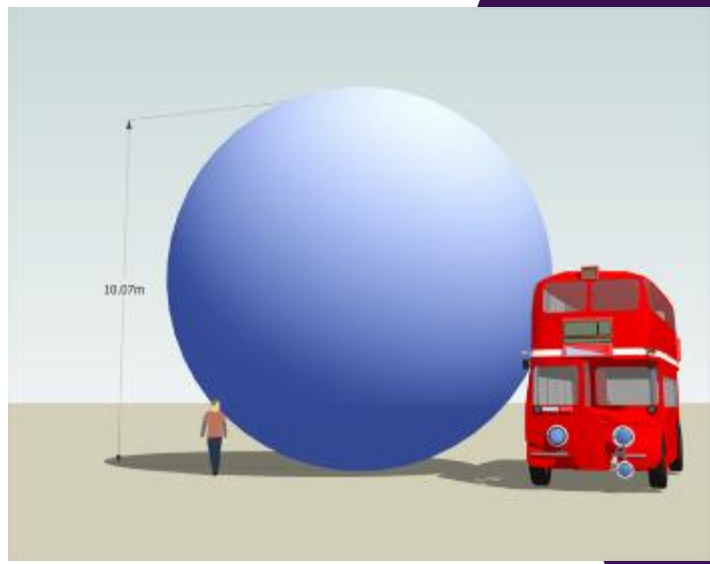
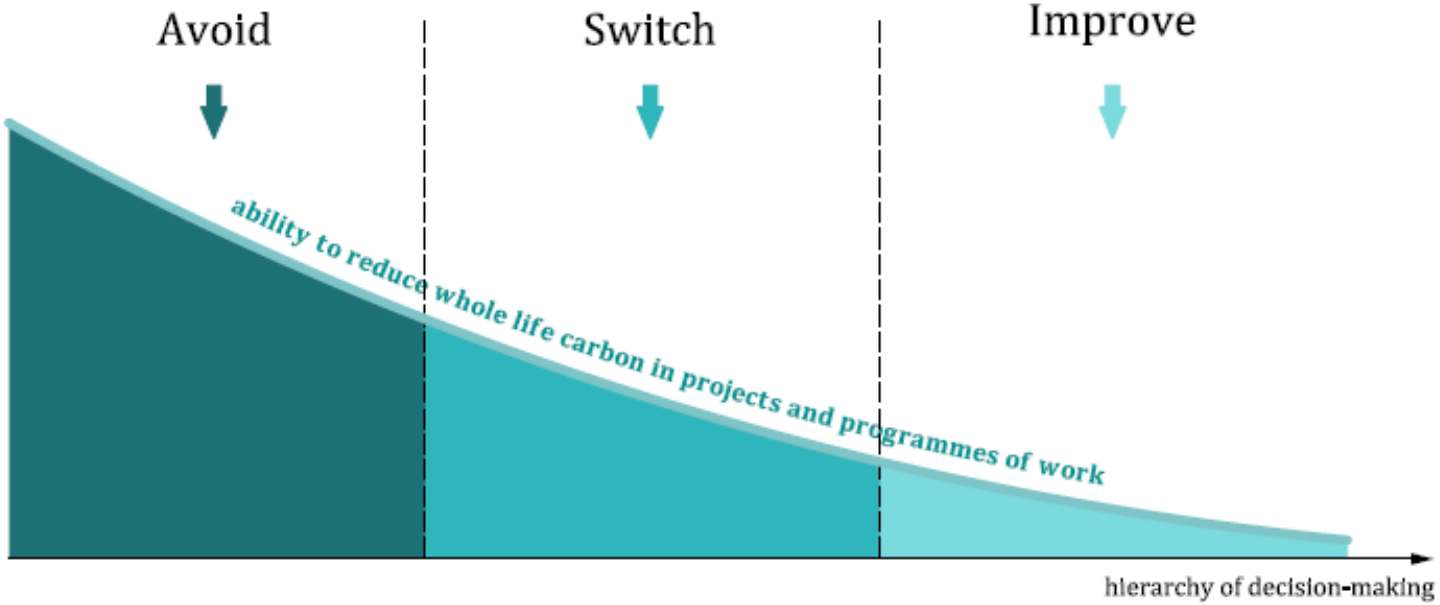


Image source and copyright: https://www.carbonvisuals.com/blog/a-one-ton-time-bomb

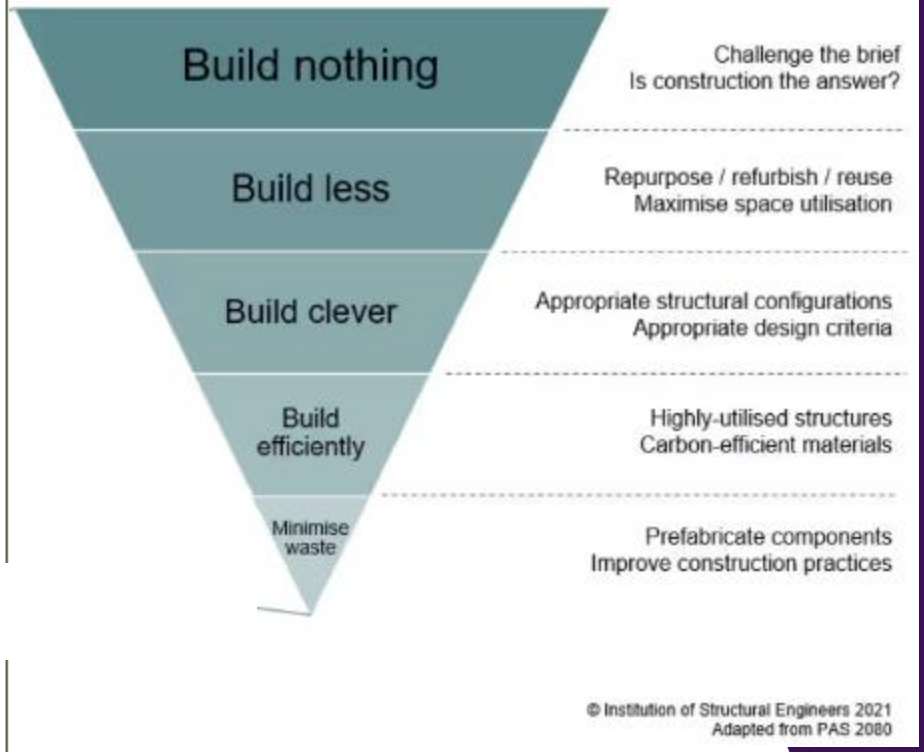
Carbon Reduction Hierarchies: Avoid, Switch, Improve

Transport for West Midlands

Figure 5 – Carbon reduction hierarchy



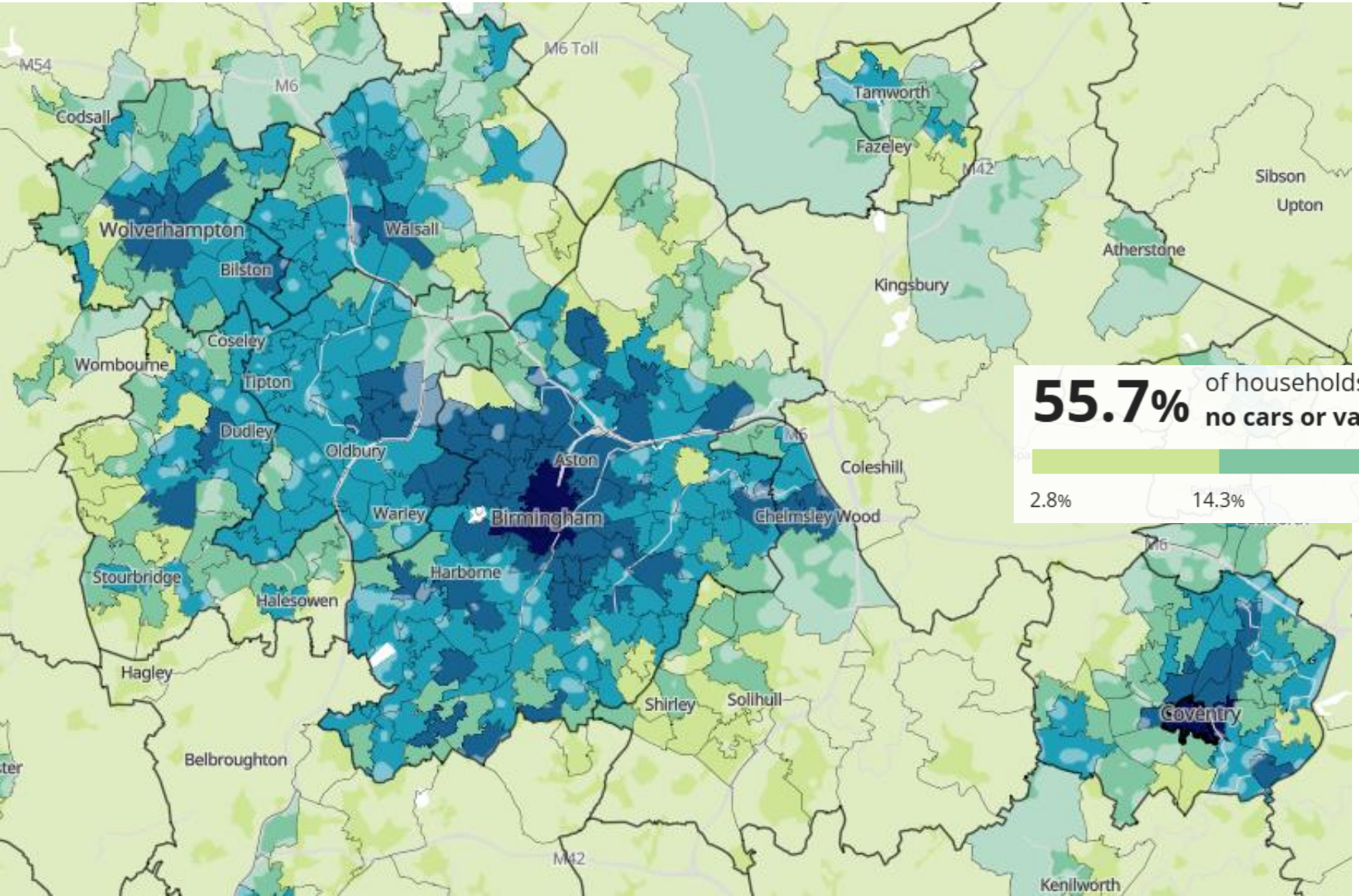
NOTE This figure represents a simplified and streamlined version of the carbon reduction hierarchy presented in PAS 2080:2016 and the Infrastructure carbon review *[1]. It has been updated to clarify its applicability and relevance to a wider range of projects and programmes within the built environment (i.e. to clarify that the carbon reduction hierarchy is not solely about new builds).*

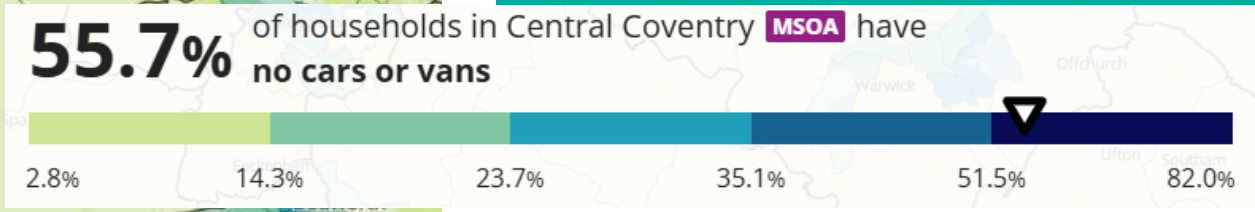


Source: PAS 2080:2023 Carbon Management in Infrastructure | BSI

Source: Net zero hierarchy - The Institution of Structural Engineers

Travel context



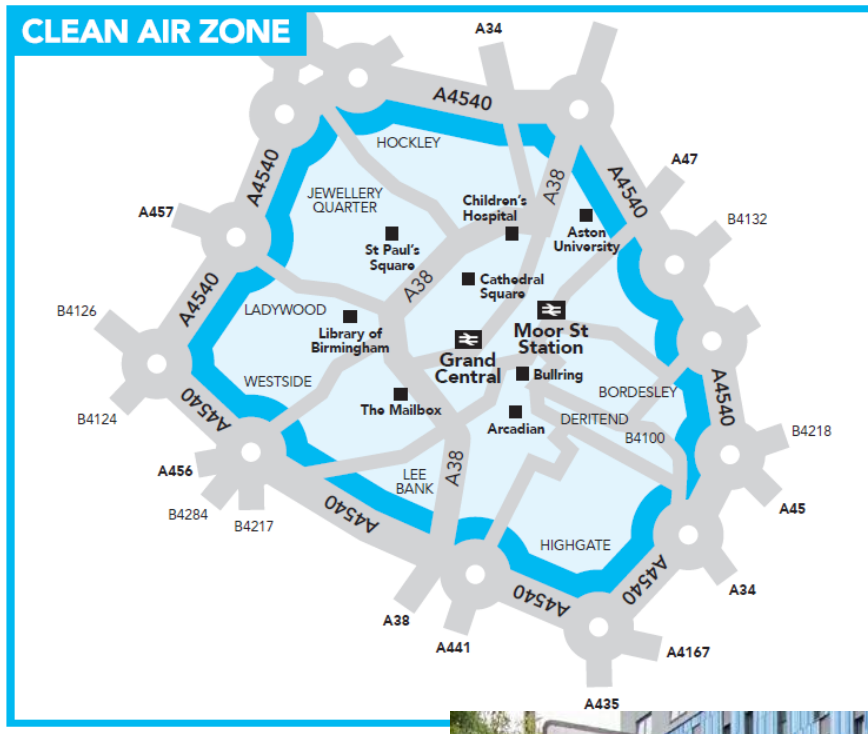


[WMCA Air Framework Implementation Plan 2024-2026 (November 2023)]

[Resources | WM Air Quality]

[Number of cars or vans - Census Maps, ONS]

Find address or place



Sources: West Midlands Spatial Map - Live

Clean air zone report Modal Share

Good News Highlights

Transport for West Midlands

- 5 new stations, metro extensions, EV chargers, electric buses
- 40% - of UK new cars battery EV or plug in hybrid in April 2026
- 98.8% record zero carbon UK electricity
- **14,000 cars** equivalent emissions saved by Coventry Electric Bus City

Sources: Coventry set to be the UK's first all-electric city – Coventry City Council Get on board with Coventry's all electric buses West Midlands Railway: New trains enter service on Birmingham's iconic Cross City Line | West Midlands Railway University station GB Monthly Energy Stats | NESO West Midlands rail revolution - five new stations All aboard as new Metro extension to Millennium Point opens this Easter UK New Car SMMT

Dudley Interchange

Transport for West Midlands

- **Links Bus and Metro** 26 Carbon Saving Opportunities implemented, in construction and use: Efficiency, material recycling, electrification, grouted asphalt
- Will serve over **10,000** passengers per day
- Lifetime emissions equivalent **36** typical family cars

The Cross City Bus project will provide many benefits for the community including:

- more **reliable, regular and predictable journey times** saving valuable time
- Helping **reduce traffic congestion**
- **Boosting productivity** so you can spend the time saved from faster services on your family and friends and hobbies

Cross City Bus | TfWM

Bus Priority Programme

- Applying carbon reduction hierarchy
- Changing future travel matters more than infrastructure carbon emissions
  - **Reduced car use estimated 35x carbon impact of construction**
- Optimising efficient design and delivery

Summary

Internationally, nationally and locally, ambitious targets for climate action have been set

Reducing carbon emissions across transport and infrastructure is integrated to wider project development and delivery

We are prioritising climate actions that offer additional benefits to the region

We're making good progress, and continue to be ambitious to improve, with fair, just, inclusive approaches to **benefit people** and therefore **achieve** social and economic **outcomes**.

Birmingham City Council

Collaboration & regional engagement to address local air quality challenges

4th June 2026

Sally James, Air Quality Policy Manager

Where we are

- Air quality challenge from a Local Authority perspective
- Route to achieving net zero in transport sector
- Maximising the benefits of regional collaboration & academic research
- Real world application of tools such as AQ-LAT & Climate Explorer
- Health-centred approach to climate policy

The challenge

- How climate risks are affecting health & wellbeing in Birmingham
- How climate action could reduce inequalities & improve population health
- Economic implications of climate-related decisions

Air Quality

Local Air Quality Management

Air Quality Monitoring – 14 real time stations and 135 diffusion tube sites

Birmingham Real Time Air Quality

Birmingham Air Quality Diffusion Tubes

www.birminghamairquality.co.uk

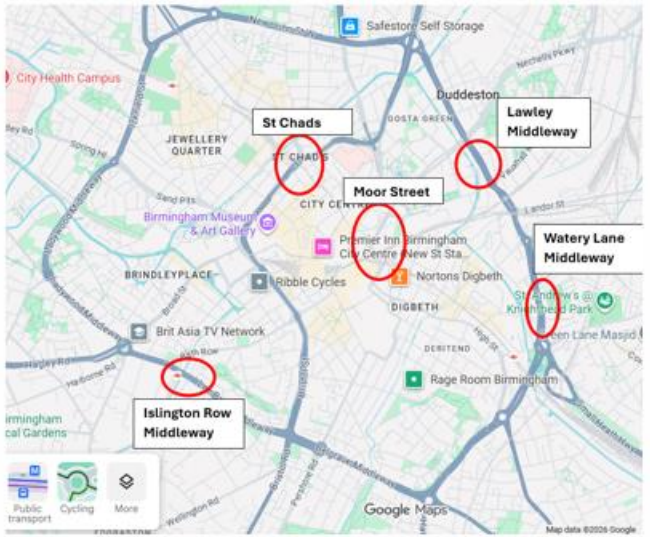
Monitoring during 2022-24 confirms NO_2 problem is confined to the city centre area

Air Quality Action Plan is set to be refreshed in 2026 focussing on the city centre region

Birmingham City Council

Clean Air Zone monitoring & evaluation

Remaining areas of exceedance for NO_2 identified



Options appraisal study commenced to identify the year of natural compliance and what action can be taken to bring this forward to the ‘shortest possible time’. Study to conclude spring 2026.

Air Quality

Smoke Control Order renewal

New SCO made September 2025

Comes into force 23 March 2026

Brings vessels into scope – consideration of economic and welfare issues being undertaken

Support to residents of fixed moorings to upgrade their stove to an exempt appliance

Allows enforcement in response to complaints via civil sanctions (Penalty Charge Notices)

Clean Air Strategy Refresh

2022 Strategy will be refreshed in 2026

Informed by PH's Air Quality Needs Assessment (due June 2026)

Placing air quality as an issue of social justice & health inequality

Focus on Particulate Matter & Indoor AQ (inc. damp, mould, woodburning, cooking)

Birmingham City Council

- Addressing air pollution to improve the quality of our environment aligns with:
  - our City Vision's mission around safety & sustainability
  - our City Vision's mission on health, equity & inclusion that aims to tackle the main sources of poor health & create a healthier environment, removing barriers to people achieving their full potential

- Impact of indoor air pollution on public health is of growing concern, alongside non-exhaust emissions

- Significant potential to improve energy efficiency & indoor air quality of BCC's housing stock of over 60,000 properties

Recognising co-benefits of addressing air quality & Net Zero at the same time

- ✓ Embedding AQ within BCC's overall work to improve **sustainability**, taking multi-agency, **cross-cutting** approach, recognising policy benefits of improving AQ to be gained by other teams
- ✓ Emphasis on awareness, engagement & enablement, ensuring people are supported to **change habits**, from how they use public transport, to how they heat their homes & get to school & work
- ✓ Committing to improve air quality, reduce carbon emissions, improve transport infrastructure, & increase levels of walking & cycling

Climate-Health Explorer & ongoing collaboration supports us in

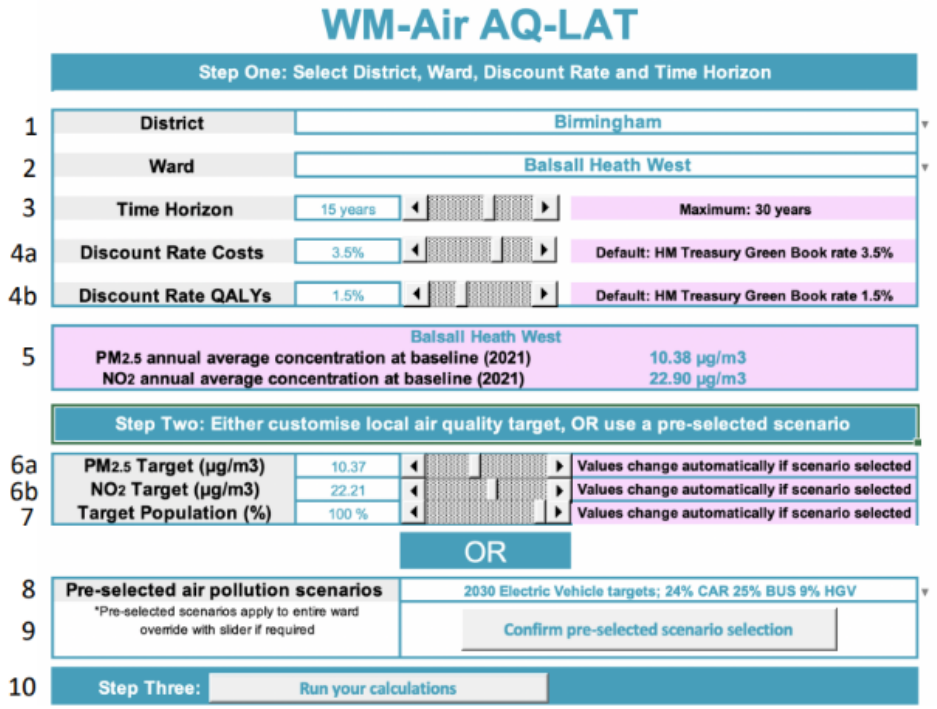
prioritising interventions in areas with overlapping vulnerabilities (pollution, deprivation, health conditions, climate vulnerability, traffic exposure)

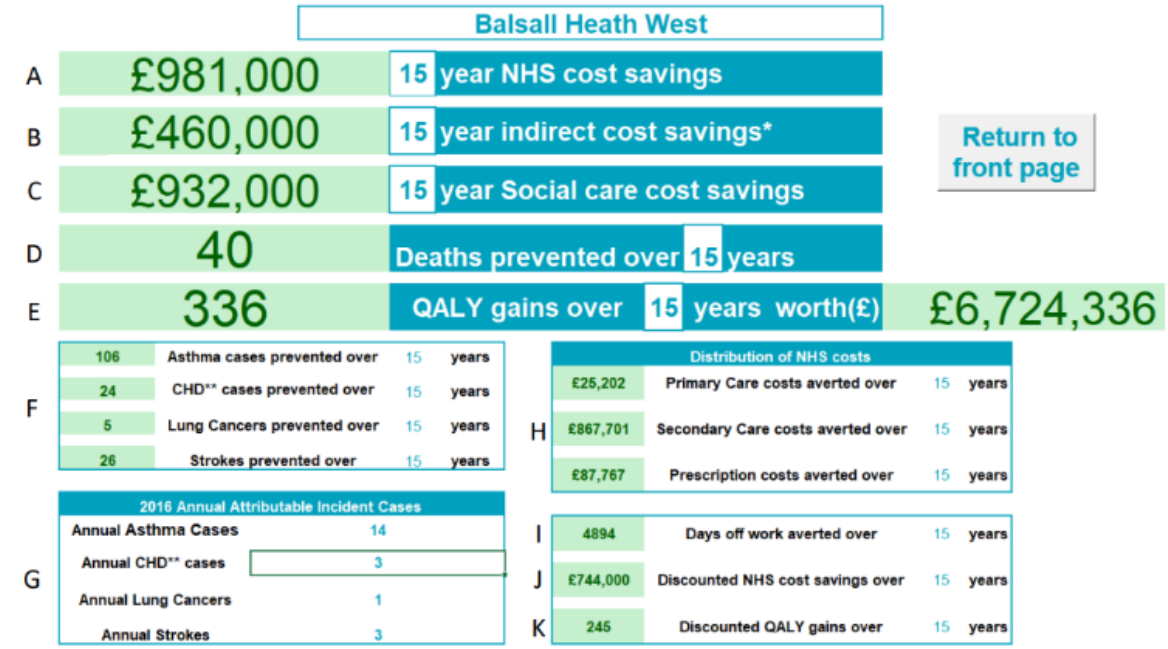
Collaboration & regional engagement

- Informing Air Quality Health Needs Assessment
- Updating Clean Air Strategy
- Briefings to Councillors
- Exploring different scenarios at ward level, using evidence-based decision-making to inform policy, focusing on health impact & equity
- Promoting active travel, greater use of public transport & cleaner vehicles

Tools for Economic impact

AQ-LAT features





1 **Desired administrative boundary** Click ▼ to activate drop down and select desired local authority
2 **Ward drop down** Click ▼ to activate drop down and select desired ward/all ward option
3 Time Horizon slider Move slider to set the duration for accruing of costs and/or benefits
4a/b Discounting slider Move slider to set rate at which costs and QALYs are discounted. Leave unchanged for HM Treasury recommended rates (See Glossary for further detail on discounting).
5 Annual average air pollutant concentrations (2021) Output shows WM-Air modelled annual average air pollutant concentrations at area level
6a/b PM2.5 / NO2 Target slider Select desired $PM_{2.5}$ /NO_2 for analysis. Selecting a pre-selected scenario will automatically change this value when scenario is confirmed
7 Target population slider Push the slider to select the proportion of desired ward who receive the change in air quality, e.g. selecting 50% will apply the air quality change to only 50% of the population
8 Scenario drop down Click ▼ to activate drop down to choose from preloaded scenario effects
9 Confirm scenario selection button Please press this button after choosing from the drop down to ensure that appropriate pre-selected scenario values load into both $PM_{2.5}$ and NO_2 target sliders
10 Run calculation button Will perform calculations and deliver an output dashboard

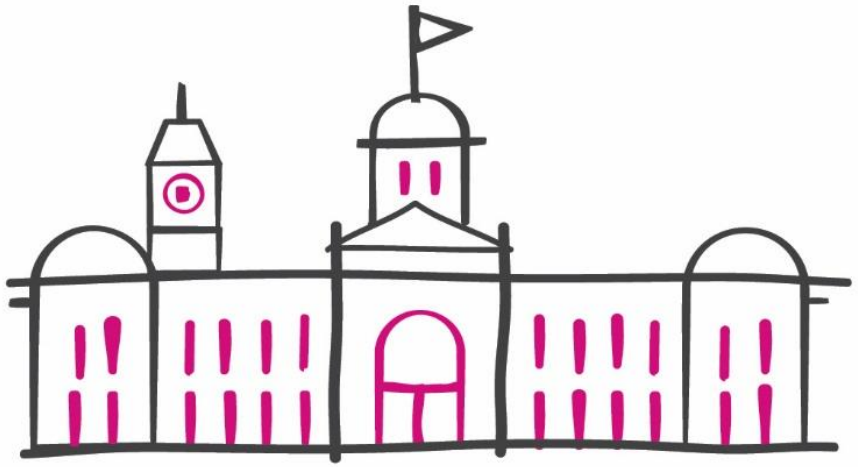
A NHS cost change Displays change in public NHS spending only related only to treating core diseases included in the model
B Indirect cost change Change in costs related to time off work for absence related to core diseases included within the model, does not include presenteeism or care costs
C Social care cost change Change in social care costs related to managing core diseases included in the model
D Change in deaths prevented Change in deaths from known all-cause mortality relationship with air pollution, includes mortality impacts from diseases not included in the model.
E Change in QALYs Change in quality-adjusted life years accruing from changes in mortality and cases of core disease included in the model.
F Change in disease cases Change in cumulative incidence in core diseases across time horizon of the model
G Annual attributable incident cases Number of annual incident disease cases related to baseline air pollution exposure
H Distribution of NHS cost changes Subdivides the NHS cost saving (shown in A) into silos
I Change in Days off work Change in workplace absence related only to core diseases included in the model
J/K Change in discounted NHS costs and QALYs This figure applies the discount rates specified in 4a & 4b to the NHS cost changes (shown in A) and QALY changes (shown in E).
*All effects are shown across time horizon chosen in Time Horizon slider (3)

Birmingham City Council

Working together to improve air quality for a brighter, fresher future

Thank you

Sally James
Air Quality Policy Manager
Birmingham City Council
sally.james@birmingham.gov.uk

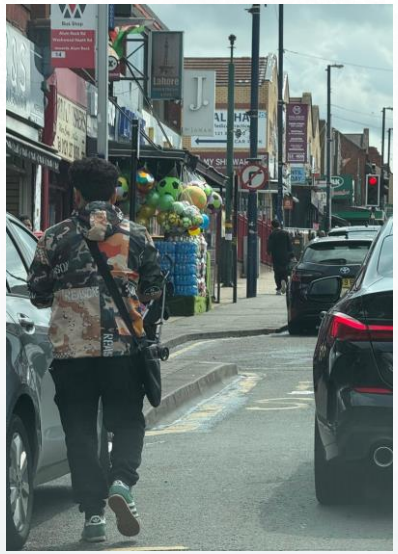


Derek's Story: Making Space to Move

Who cities are truly built for — and what kind of urban future we might shape if we began by listening to those who must navigate the edges?

Fanniza's Story: Shared Spaces, Unspoken Frictions

How people manage and adapt. The small acts — the adjustments, the pauses, the ways people read their environment and make it work for them, even when it isn't ideal.



Explorer Demonstration

Climate-Health Explorer

Evidence | Insight | Action

Dr James Hall

Sophie Morris

Launch the Explorer: www.climatehealth-explorer.org.uk

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Questions and Answer Session

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Chair

Christopher Hammond

Chief Executive

UK100

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Panellists

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Andy Poole

Sally James

James Hall

Sophie Morris

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Poll Questions

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Evidence | Insight | Action

1. ***How could you use the Climate-Health Explorer in your role?*** (select all that apply)

2. ***Which datasets would be most useful to download from the Climate Health Explorer?*** (select all that apply)

3. ***Which wider health determinants would be of interest to you for adding to the Climate Health Explorer?*** (select all that apply)

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Closing Remarks

Climate-Health Explorer
Evidence | Insight | Action

Professor Zongbo Shi

Professor of Atmospheric Biogeochemistry
University of Birmingham

Principal Investigator WM-Net Zero

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Reducing road transport emissions

Climate-Health Explorer

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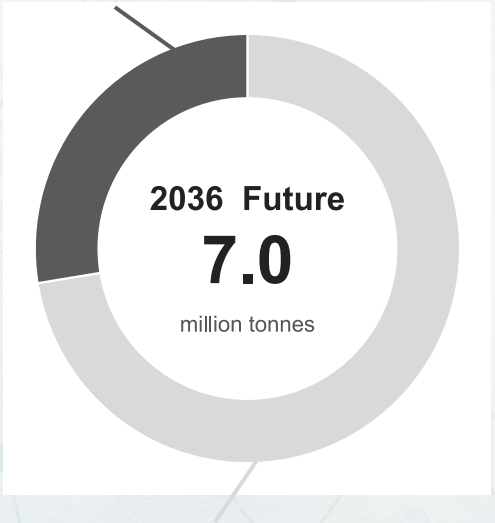
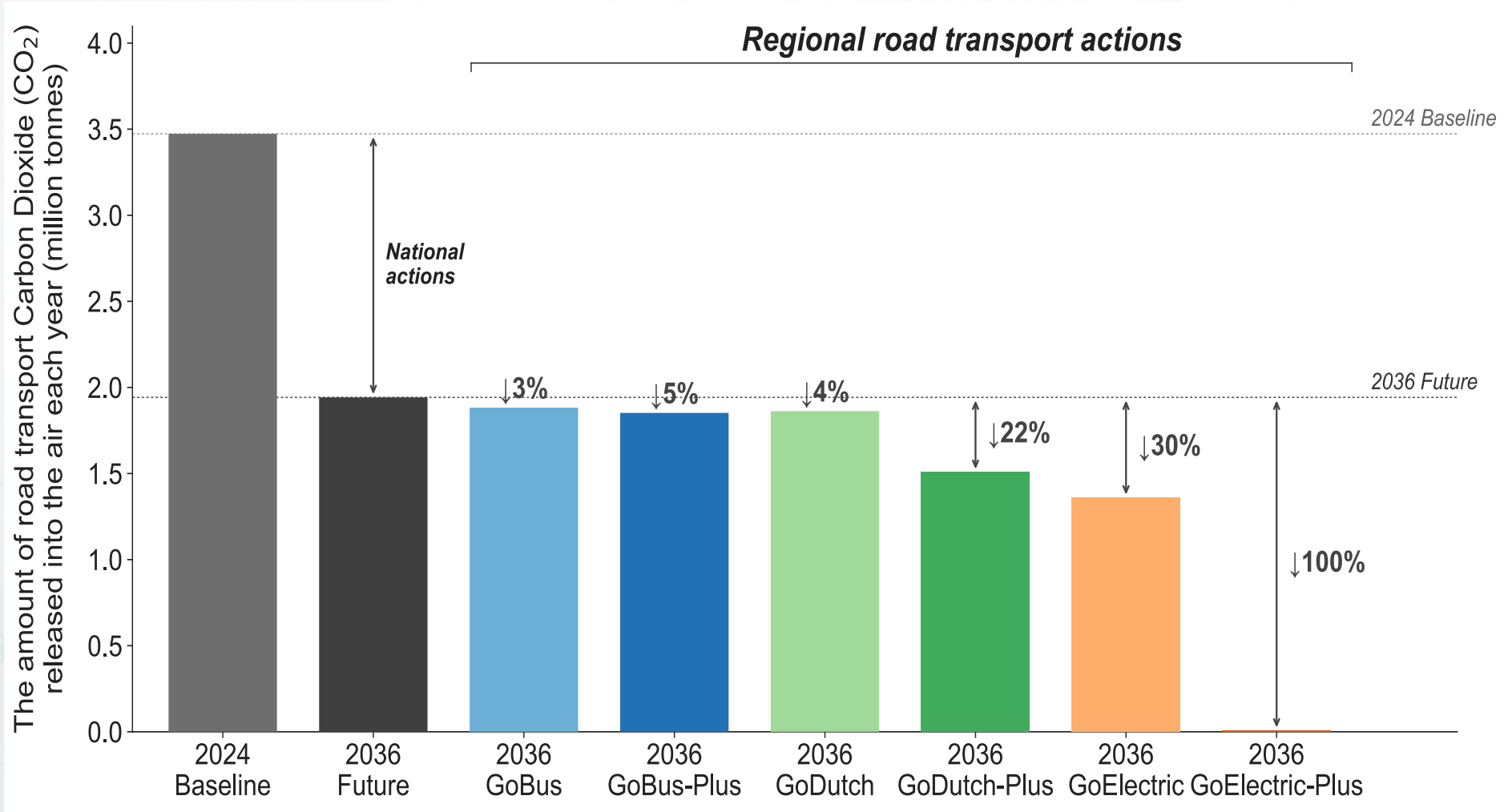
Road transport **(28%)**



Housing, industry, business and public buildings and other **(72%)**



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Health at the centre of climate action

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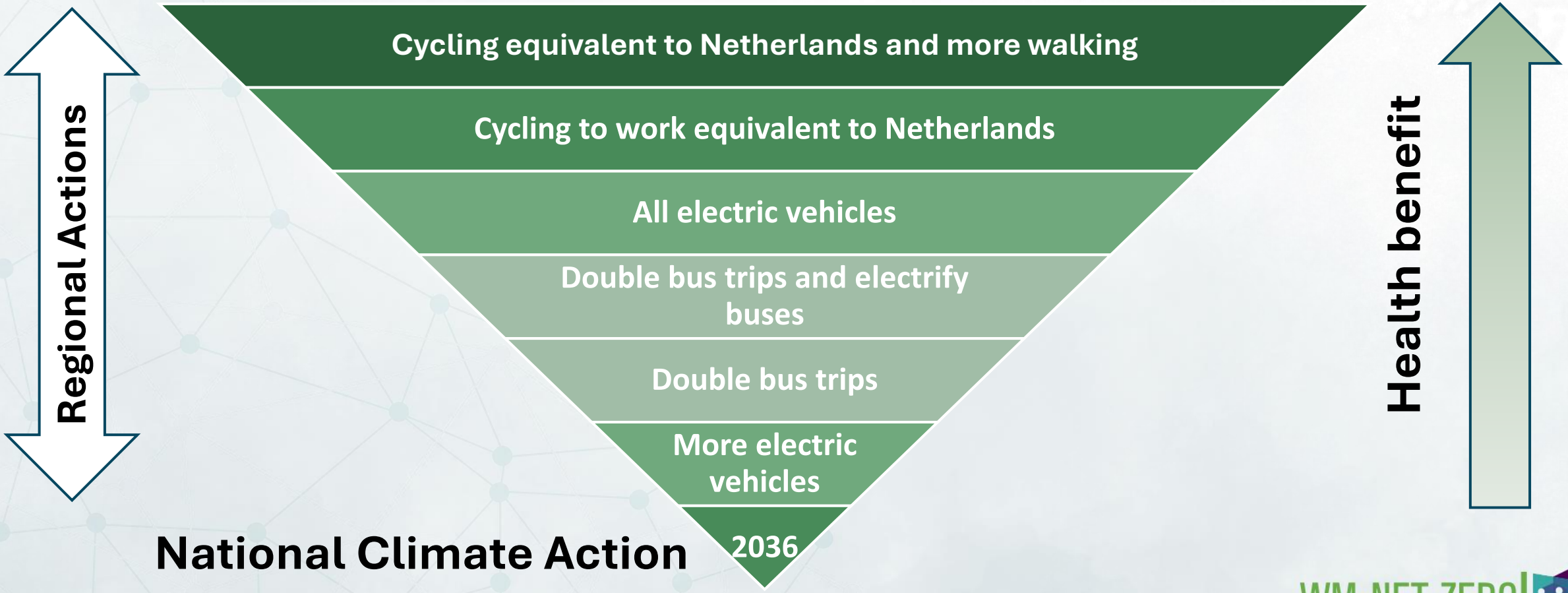
Walking and wheeling so that **everyone is physically active** will **cut 430,000 tonnes CO_2, save 3500 lives** and **£3.4 million costs.**



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Key Insights

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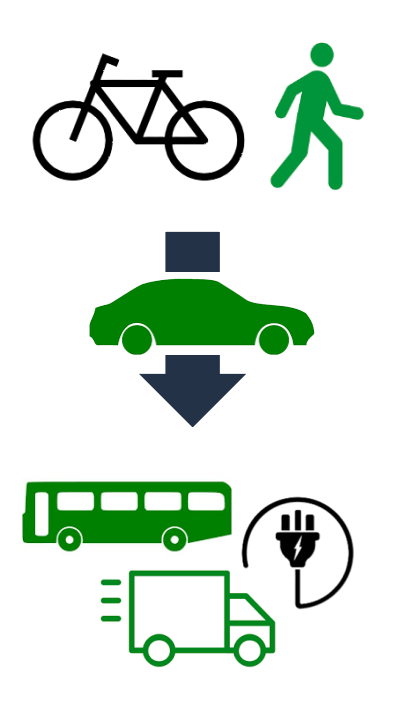

Replace short trips with walking or cycling (**shift**)

Reduce overall car use wherever feasible (**avoid**)

Electrify buses and goods vehicles (**improve**)

Walk and cycle more, drive less, electrify the rest

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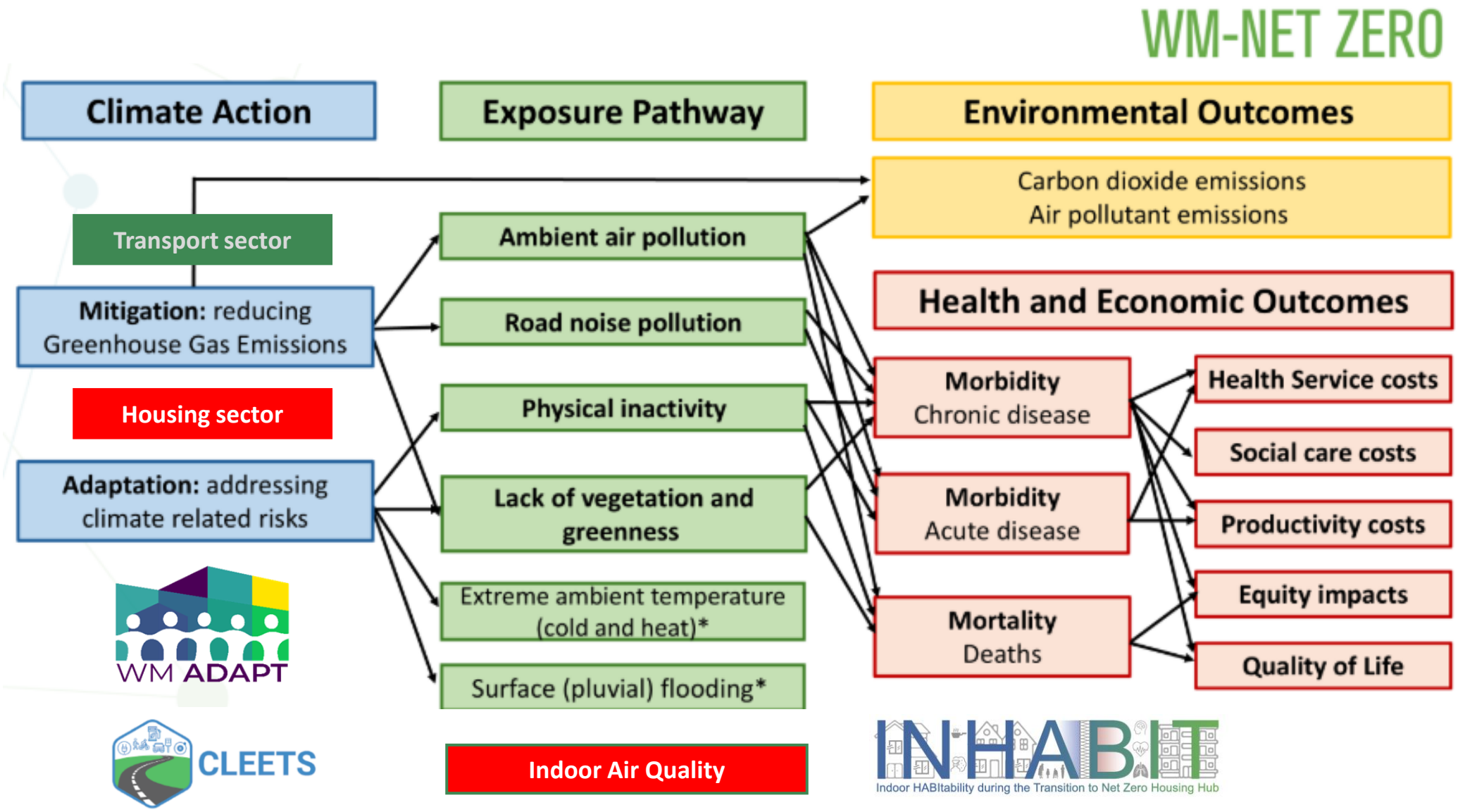
Next Steps


WM-NET ZERO
Climate Action
Exposure Pathway
Environmental Outcomes
Transport sector
Mitigation: reducing Greenhouse Gas Emissions
Housing sector
Adaptation: addressing climate related risks
Ambient air pollution
Road noise pollution
Physical inactivity
Lack of vegetation and greenness
Extreme ambient temperature (cold and heat)*
Surface (pluvial) flooding*
Indoor Air Quality
Carbon dioxide emissions
Air pollutant emissions
Health and Economic Outcomes
Morbidity
Chronic disease
Morbidity
Acute disease
Mortality
Deaths
Health Service costs
Social care costs
Productivity costs
Equity impacts
Quality of Life
WM ADAPT
CLEETS
INHABIT
Indoor HABItability during the Transition to Net Zero Housing Hub

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Have a case study suggestion?

Get in touch:

wm-netzero@contacts.bham.ac.uk

linkedin.com/company/wm-net-zero

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Close

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Christopher Hammond

Chief Executive

UK100

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Contact: wm-netzero@contacts.bham.ac.uk
Website: www.wm-netzero.org.uk
Explorer: climatehealth-explorer.org.uk

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