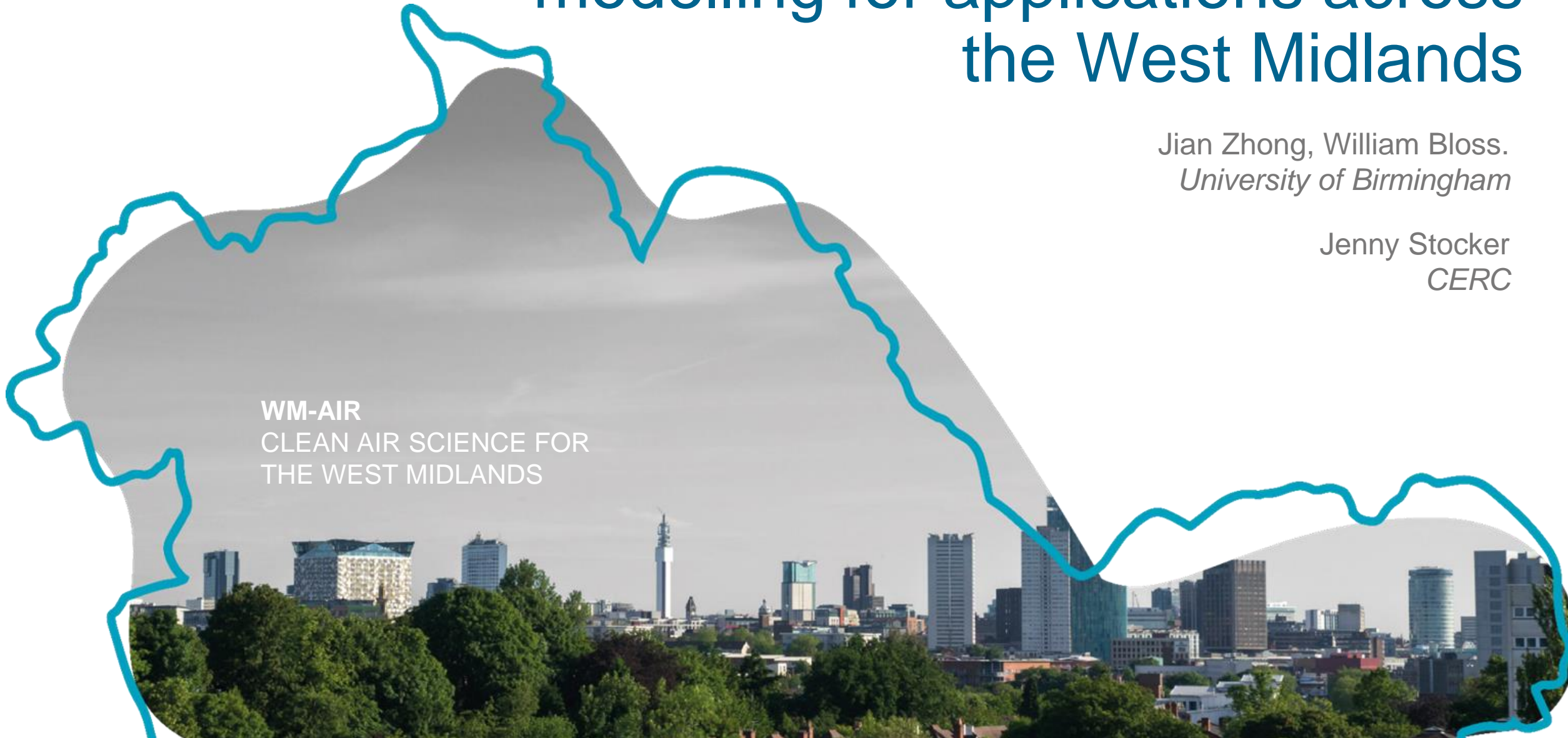


# Street-scale resolution air quality modelling for applications across the West Midlands

Jian Zhong, William Bloss.  
*University of Birmingham*

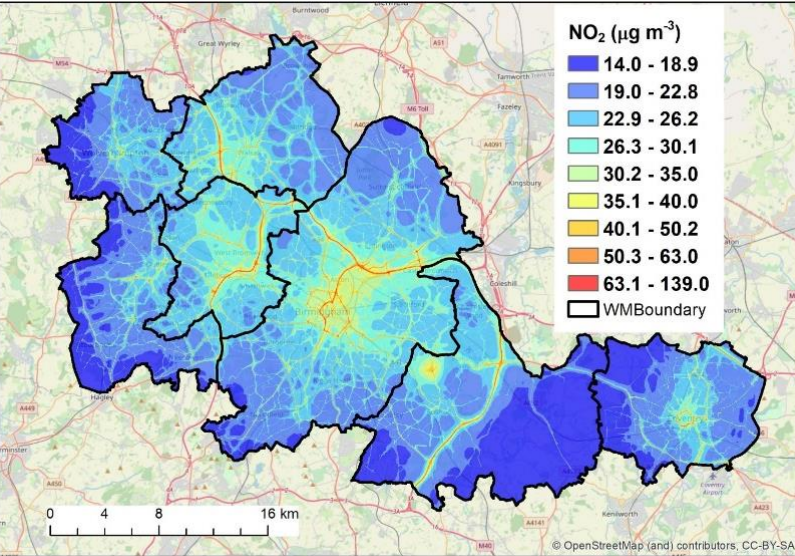
Jenny Stocker  
*CERC*

WM-AIR  
CLEAN AIR SCIENCE FOR  
THE WEST MIDLANDS

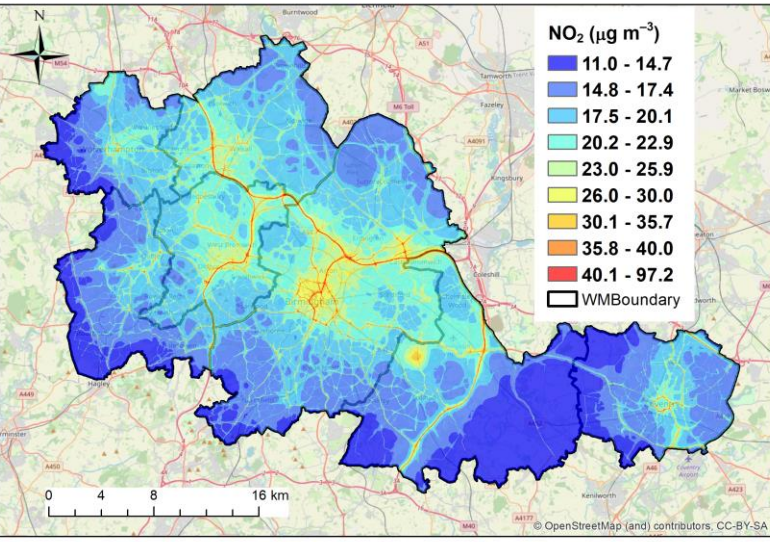


# WM-Air baseline modelling

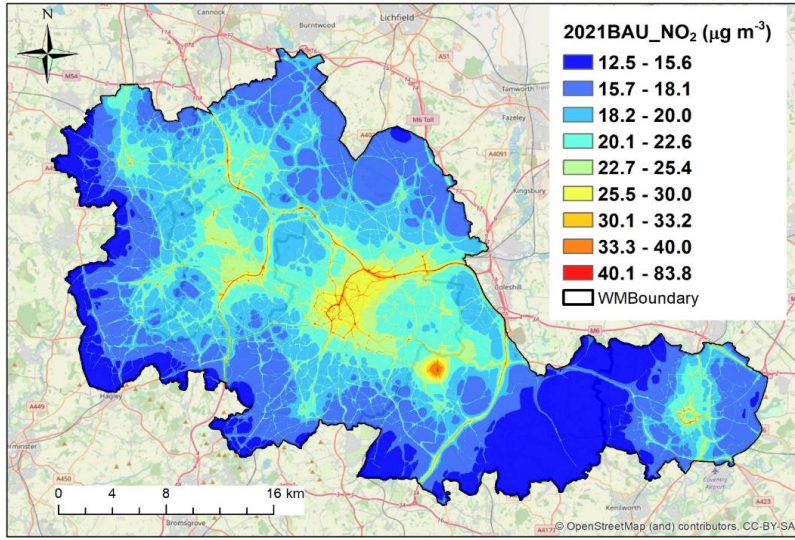
**2016 business-as-usual (2016 BAU)**



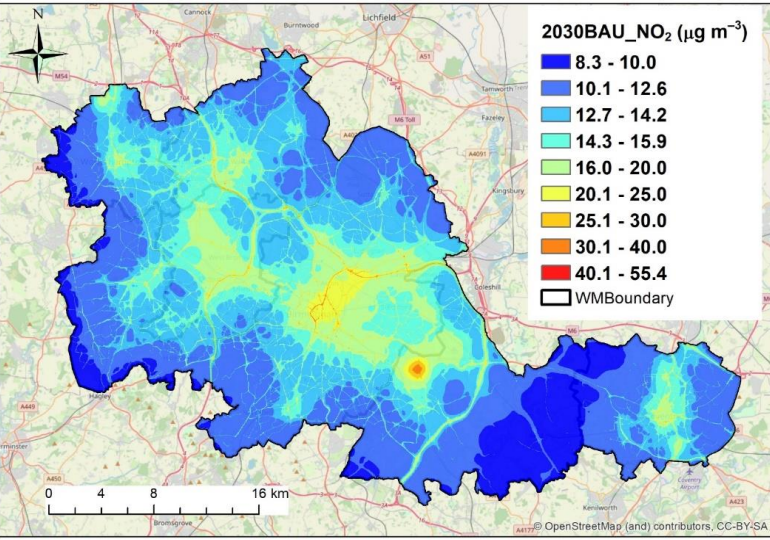
**2019 BAU**



**2021 BAU (no-covid impact)**



**2030 BAU**



Ongoing:  
 2036 BAU (TfWM LTP)  
 2041 BAU (WM2041)

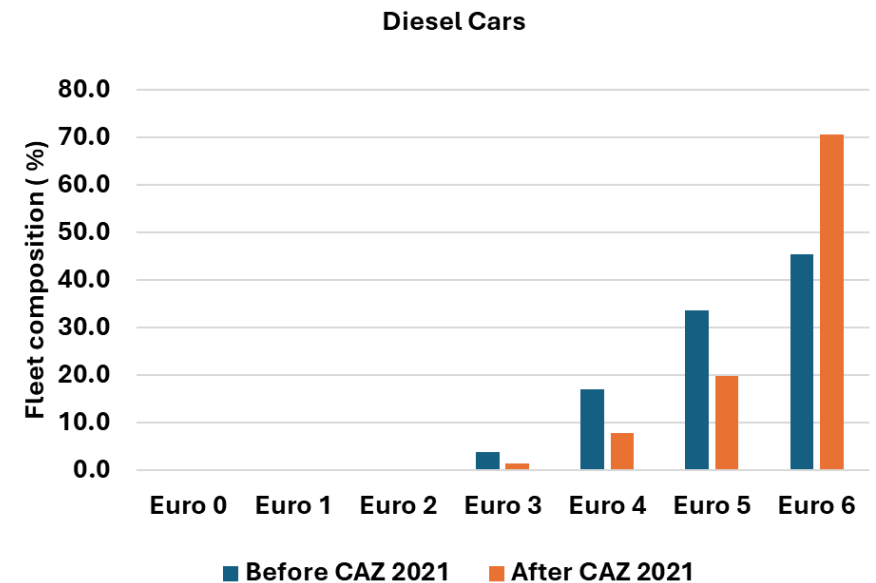
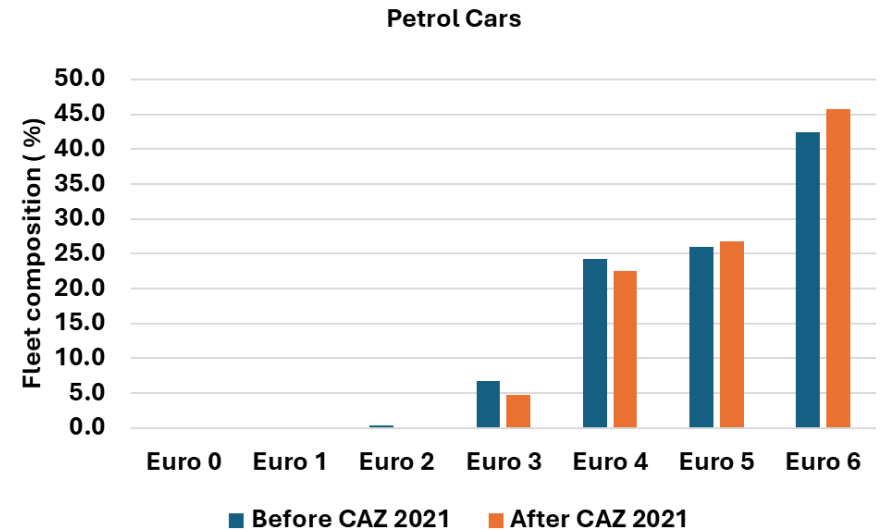
**WM-NET ZERO**

# Scenario Examples

- Birmingham Clean Air Zone (CAZ) modelling scenario
- Railway emission modelling scenario
- Bus electrification modelling scenario
- Opportunities: West Midlands transport scenarios

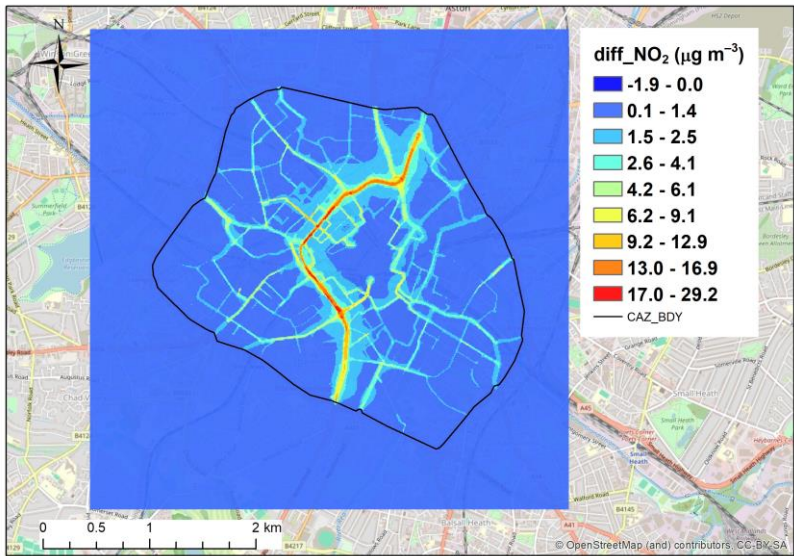
# Scenario Example: Birmingham CAZ

- **2021 BAU:**  
2019 BAU modelling configuration + **pre-CAZ 2021 traffic fleet.**
- **2021 CAZ:**  
2019 BAU modelling configuration + **post-CAZ 2021 traffic fleet.**
- **2021 CAZ\_TA:**  
2019 BAU modelling configuration + post-CAZ 2021 traffic fleet + **traffic activity reduction within CAZ.**
- **2021 CAZ\_TA\_RR:**  
2019 BAU modelling configuration + post-CAZ 2021 traffic fleet + traffic activity reduction within CAZ + **traffic activity increase on Ring Roads.**

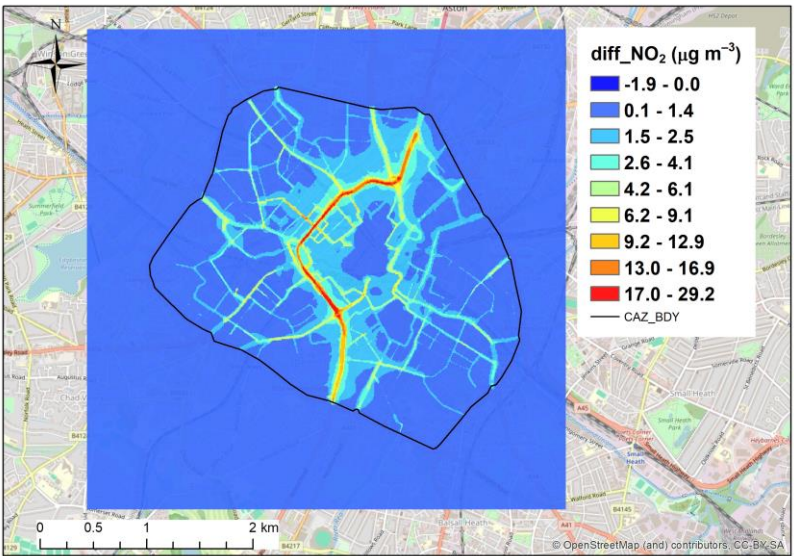


# Scenario Example: Birmingham CAZ

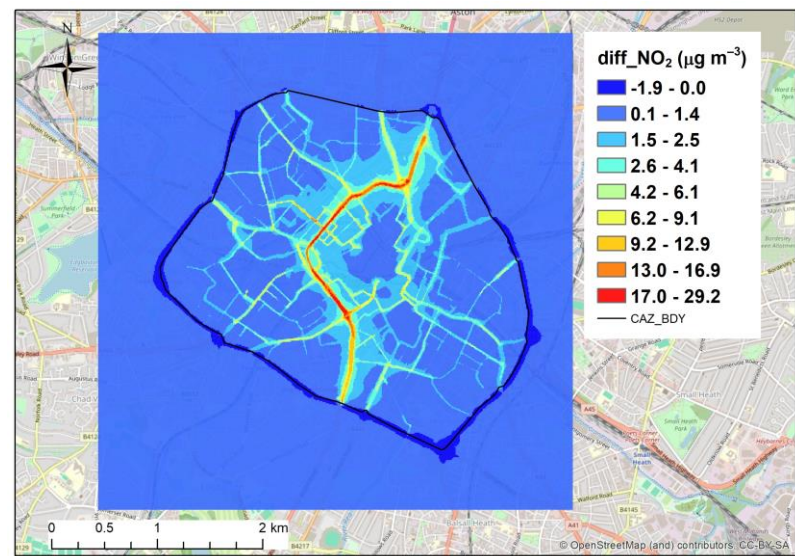
2021 CAZ (vs 2021 BAU)



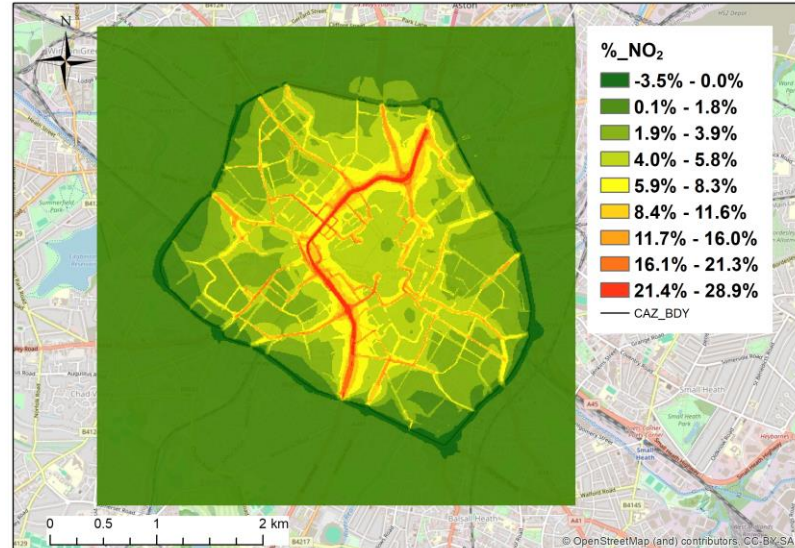
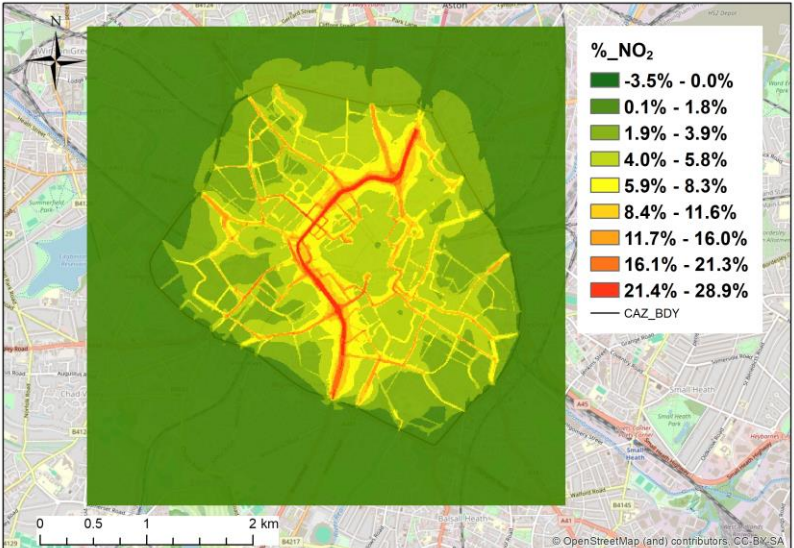
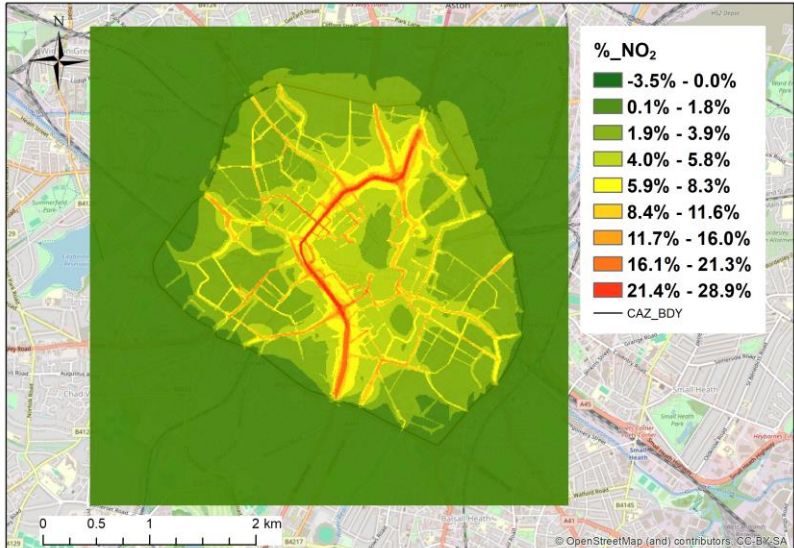
2021 CAZ\_TA (vs 2021 BAU)



2021 CAZ\_TA\_RR (vs 2021 BAU)

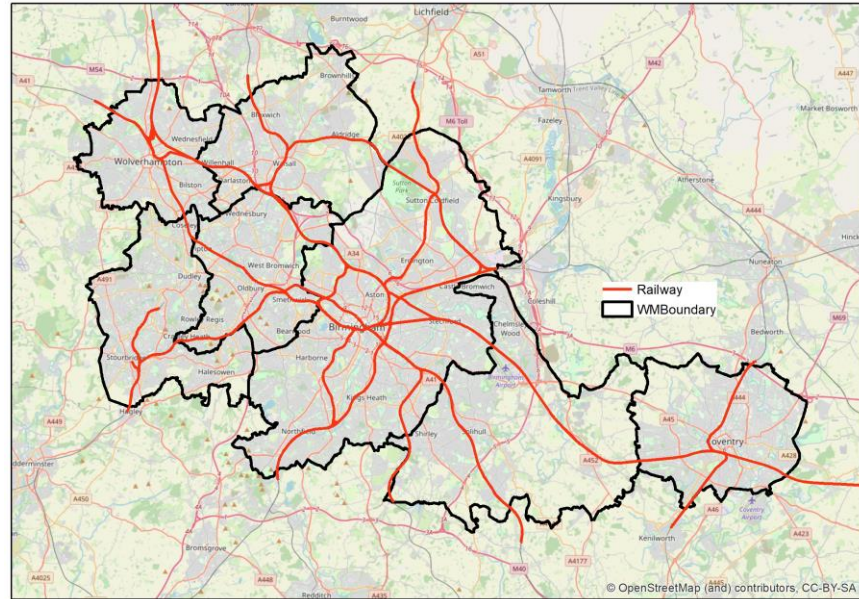


## Relative change in %

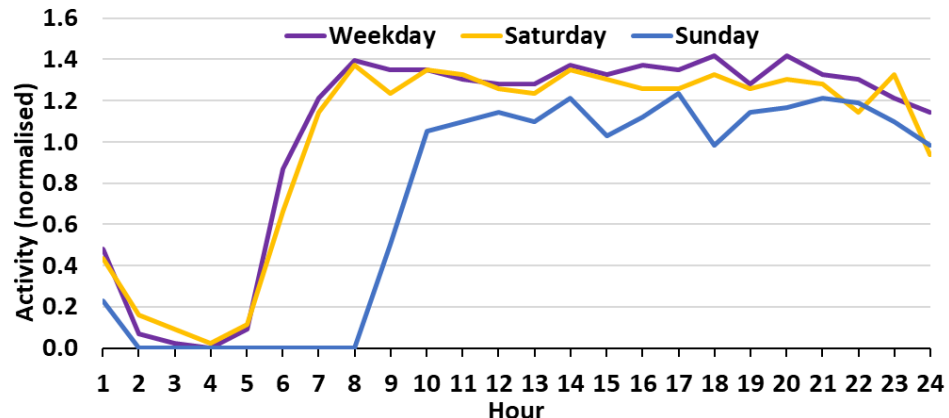


# Scenario Example: Railway emission

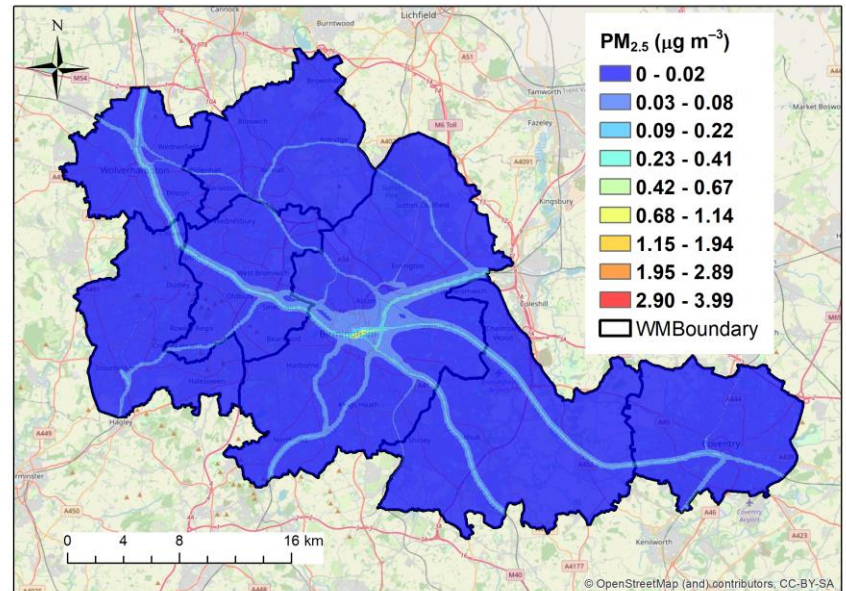
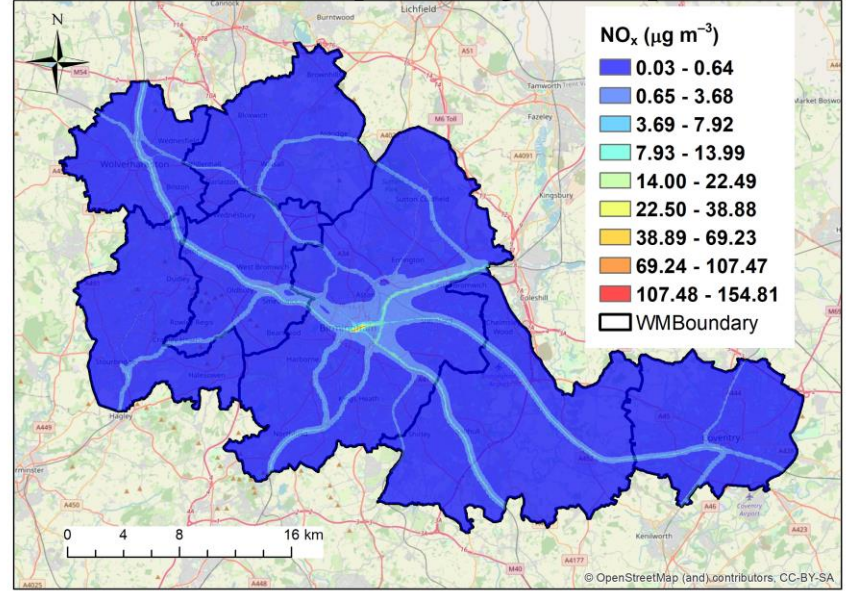
## Railway emission sources for 2019 from RSSB: NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>



Time varying profile for railway emissions (from Timetable)

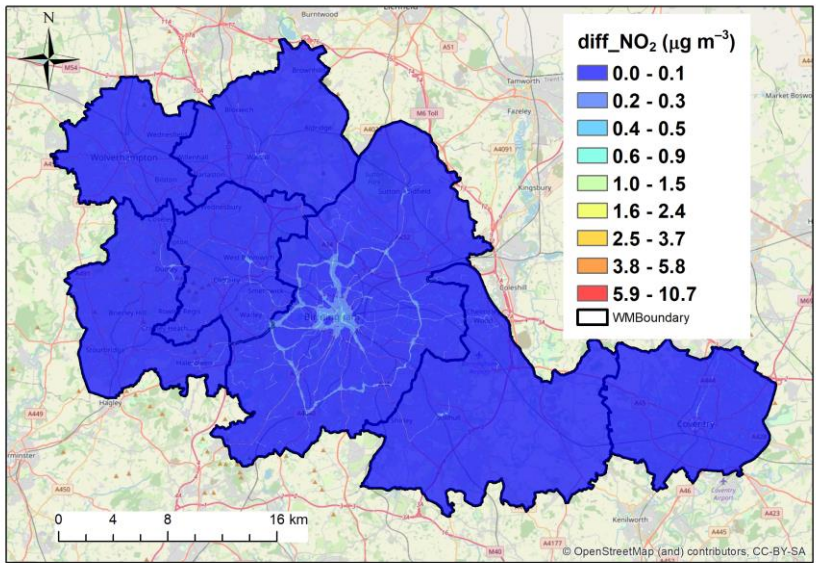


## Annual air quality maps

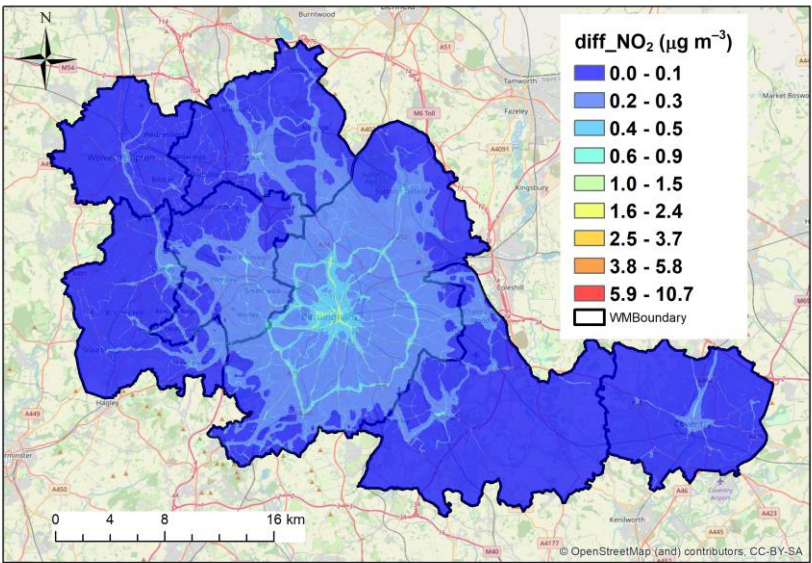


# Scenario Example: Bus electrification

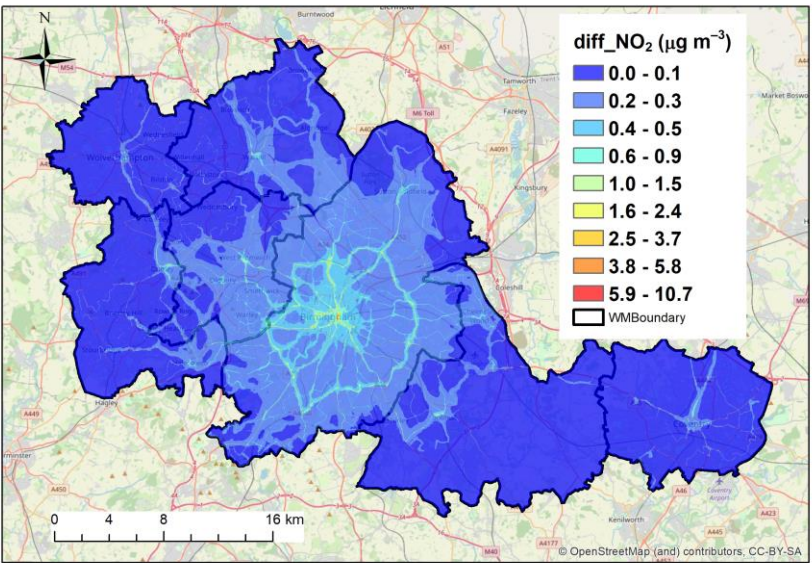
20% bus electrification (vs 2019 BAU)



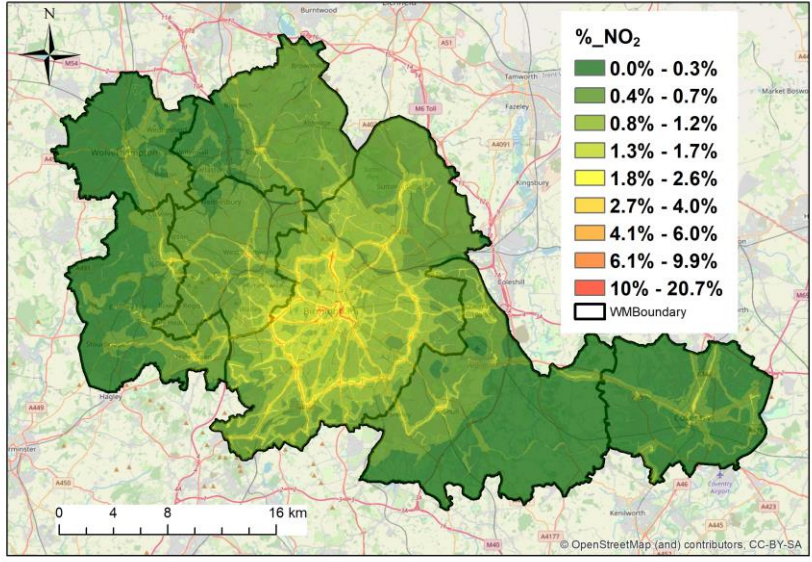
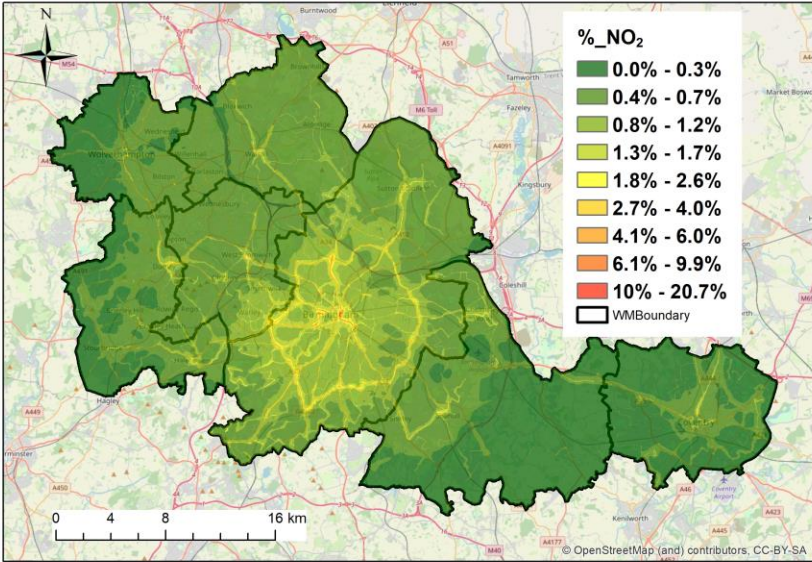
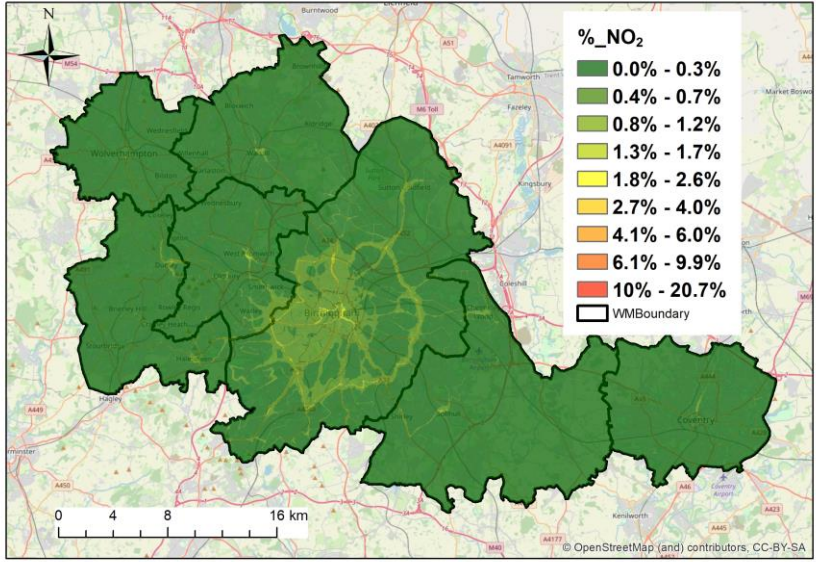
60% bus electrification (vs 2019 BAU)



100% bus electrification (vs 2019 BAU)



## Relative change in %

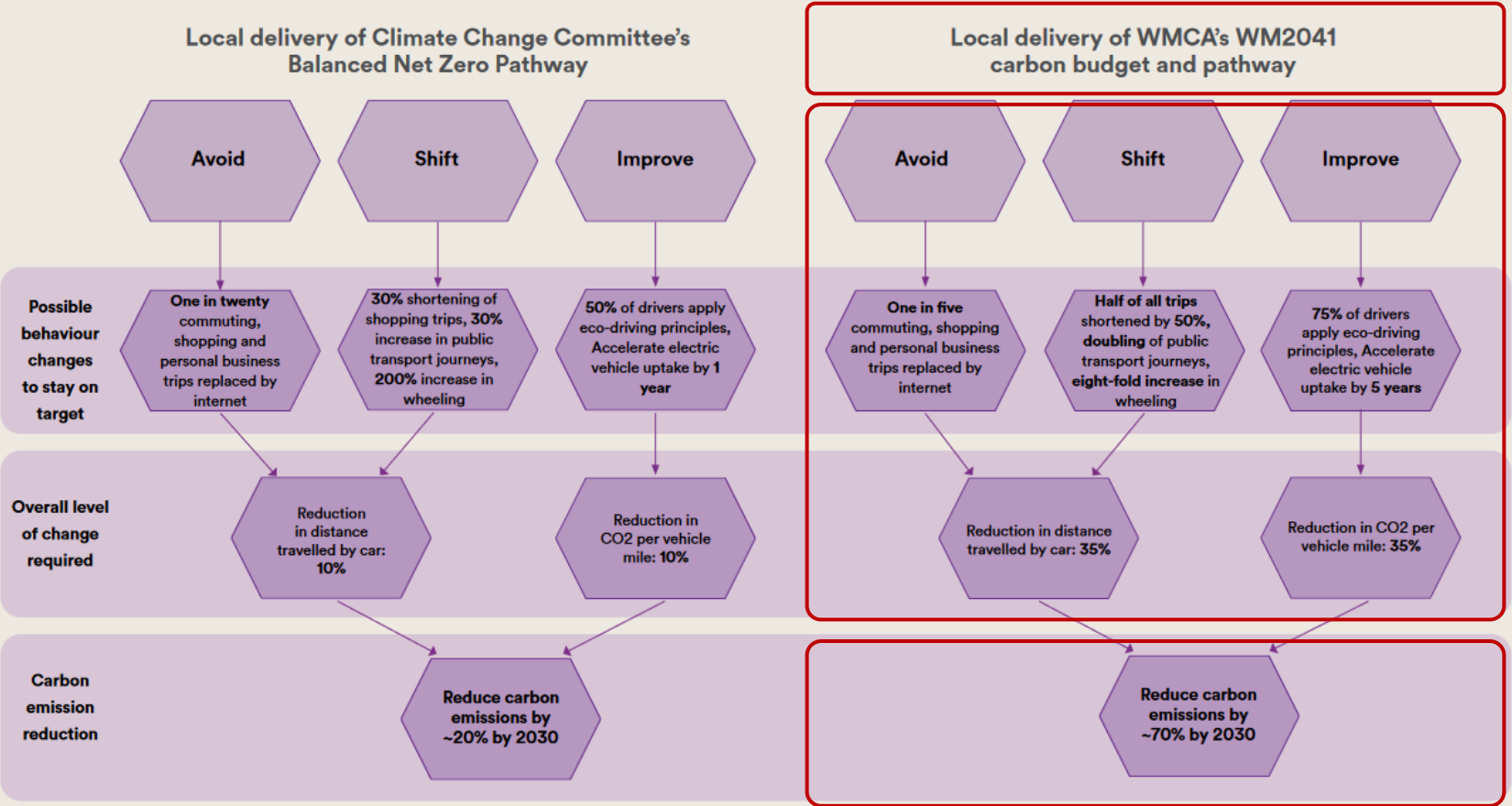


# Opportunities: West Midlands transport scenarios

## Reimagining transport in the West Midlands: Local Transport Plan Core Strategy

Policy - Aims - Scale and Pace of Change

We have translated the need for urgency into the scale of change of behaviours that will need to be delivered in the next 10 years both to meet Government's commitments and our local WM2041 commitments (see below). We will assess our progress against this scale of change as we deliver the LTP.



These required shifts for passenger travel are relative to travel demand and fleet composition predictions for 2030 and they are additional to key national policy proposals to stop the sale of petrol and diesel cars and vans by 2035.

\*Eco-driving involves changing the way we accelerate and brake, the speed we travel at, and engine rpm to reduce overall energy consumption whilst driving.

## Overarching Strategy

- Pathway

## Policy

- Action
- Policy instrument
- Different scenarios (policy target)

## Target

WM-NET ZERO