UNIVERSITY OF BIRMINGHAM | WM-AIR

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Second Annual Meeting

WP# 2, Vehicular Emission

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WM-AIR
CLEAN AIR SCIENCE FOR THE WEST MIDLANDS

WM-Air WP#2

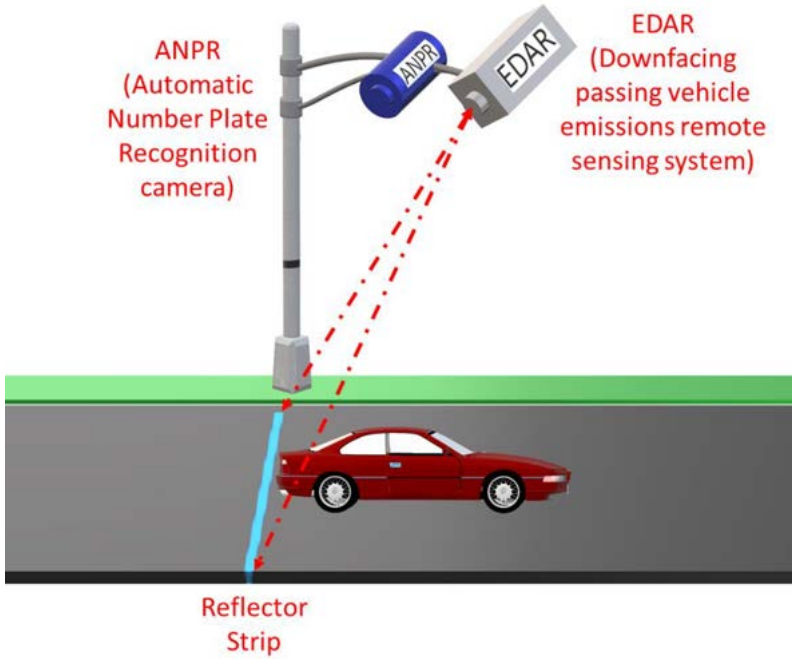
We are evaluating vehicle emissions within the entire West Midlands region.

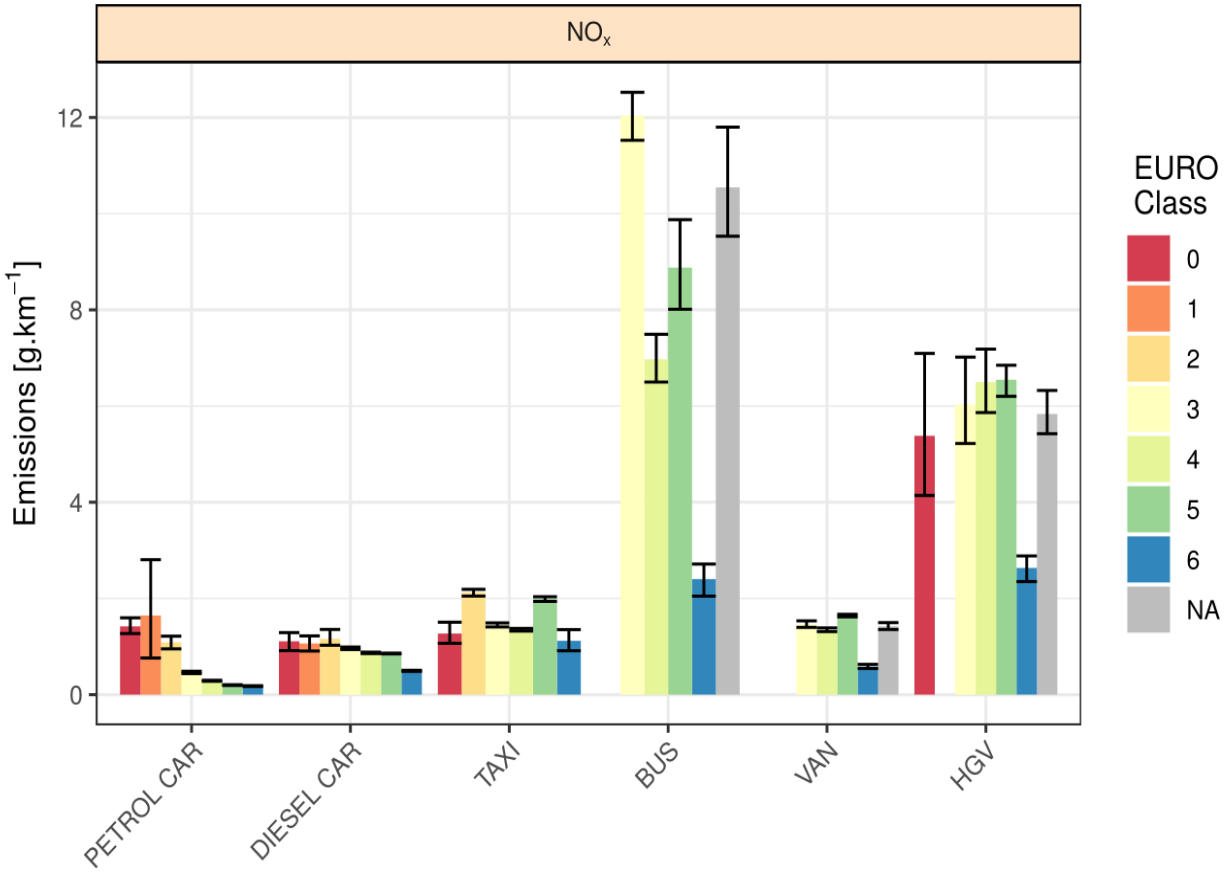
We apply real-world emission measurements and telematics data to generate the most detailed picture of vehicle emissions.

THE FLOOW

Hager Environmental & Atmospheric Technologies

Real-World Measurements (EDAR)





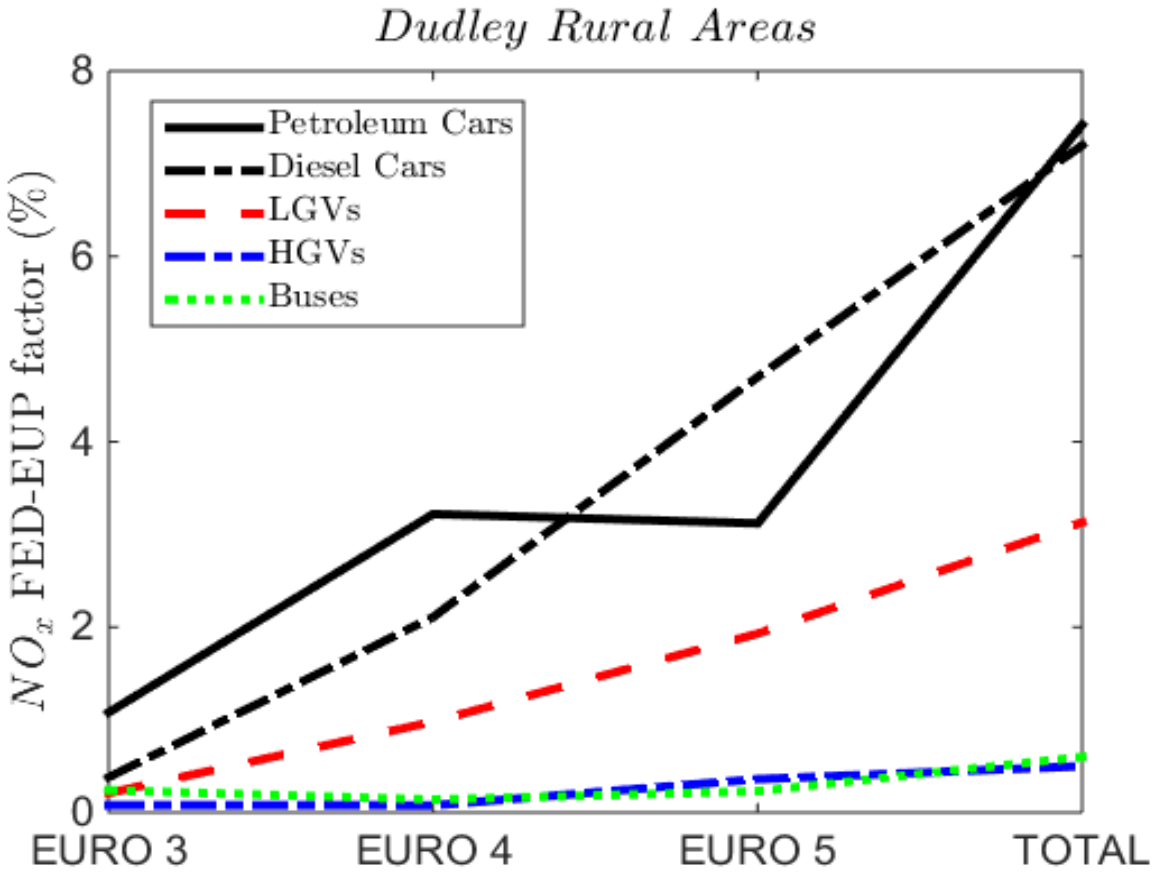
Ghaffarpasand, O., D.C.S. Beddows, K. Ropkins and F.D. Pope (2020) '*Real-world assessment of vehicle air pollutant emissions subset by vehicle type, fuel and EURO class: New findings from the recent UK EDAR field campaigns, and implications for emissions restricted zones*' Science of the Total Environment, 734, 139416, https://doi.org/10.1016/j.scitotenv.2020.139416

Hager Environmental & Atmospheric Technologies

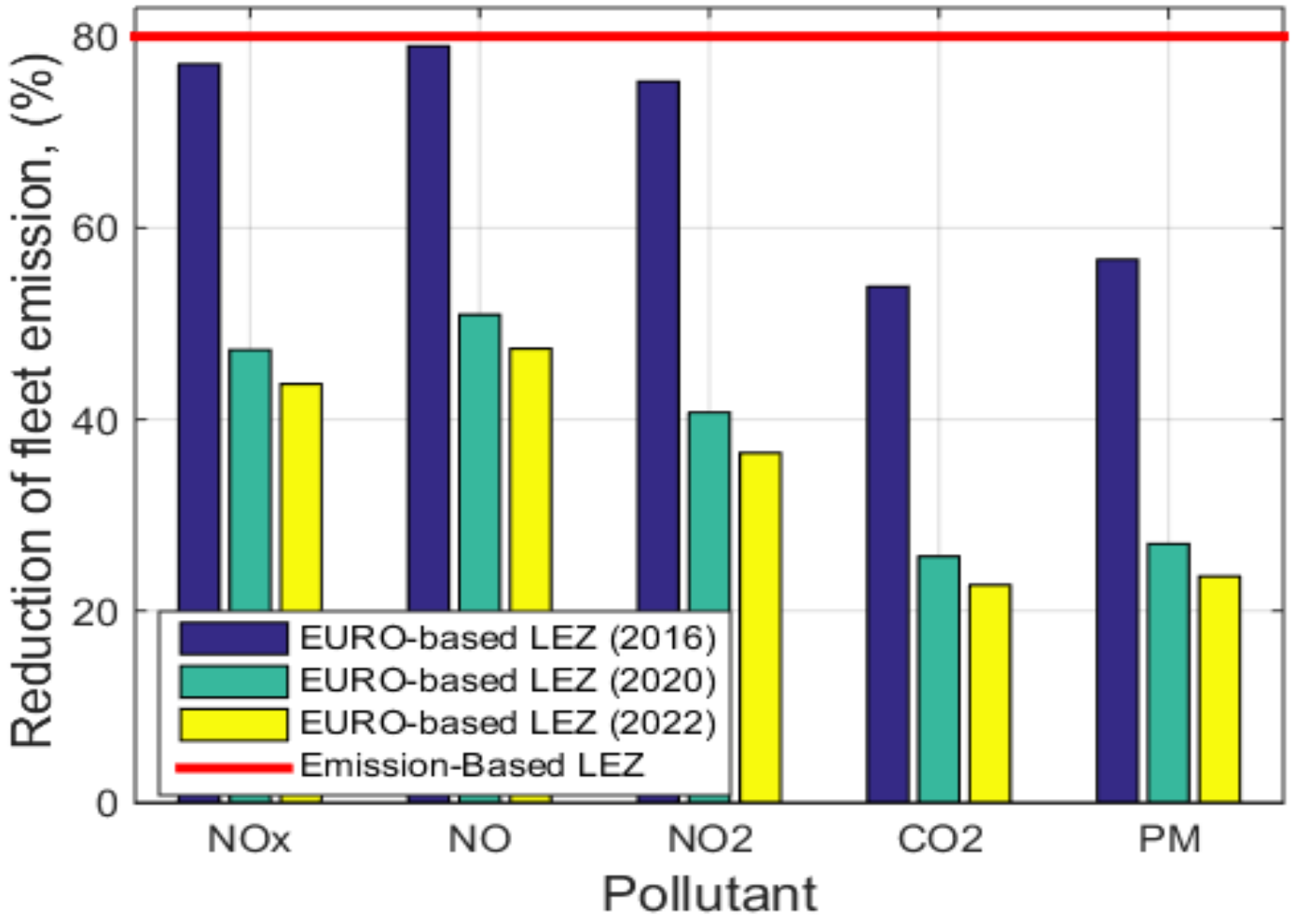
Emission Scenario Tool

A spreadsheet tool (based on the EDAR data) has been developed to test different emissions scenarios

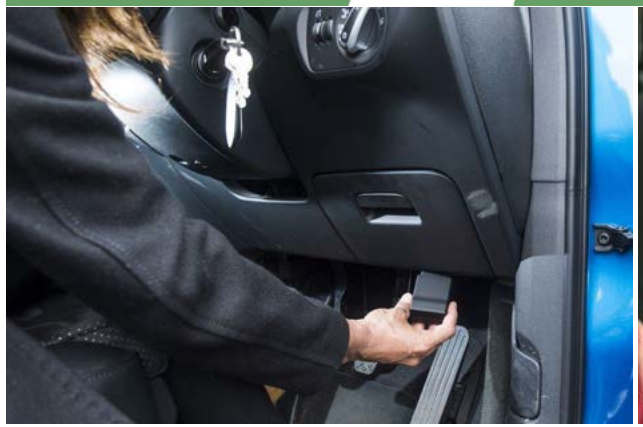
e.g. upgrade of fleet to EURO 6



Should Clean Air Zones be EURO or emissions based?



Telematics Data



We use telematics data to study the impacts of human behavior on the vehicular emissions, to assess the role of external interventions (e.g. CAZ, HS2, commonwealth games) on vehicle emissions.

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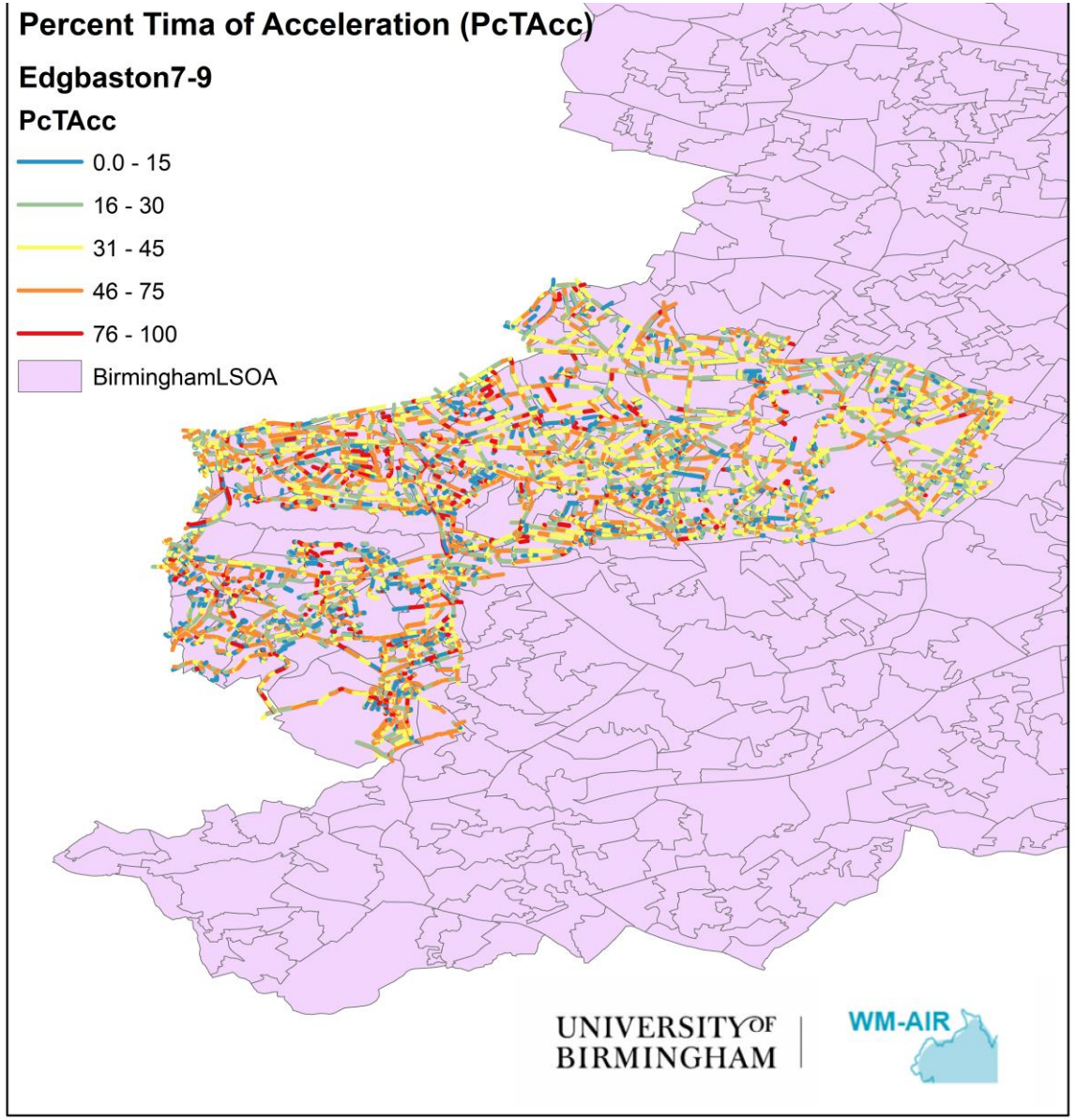
Video of brake wear case study

Mapping of Urban Mobility



- We have 27 driving characteristics for all West Midlands boroughs for the years of 2016 and 2018.

Characteristics include:

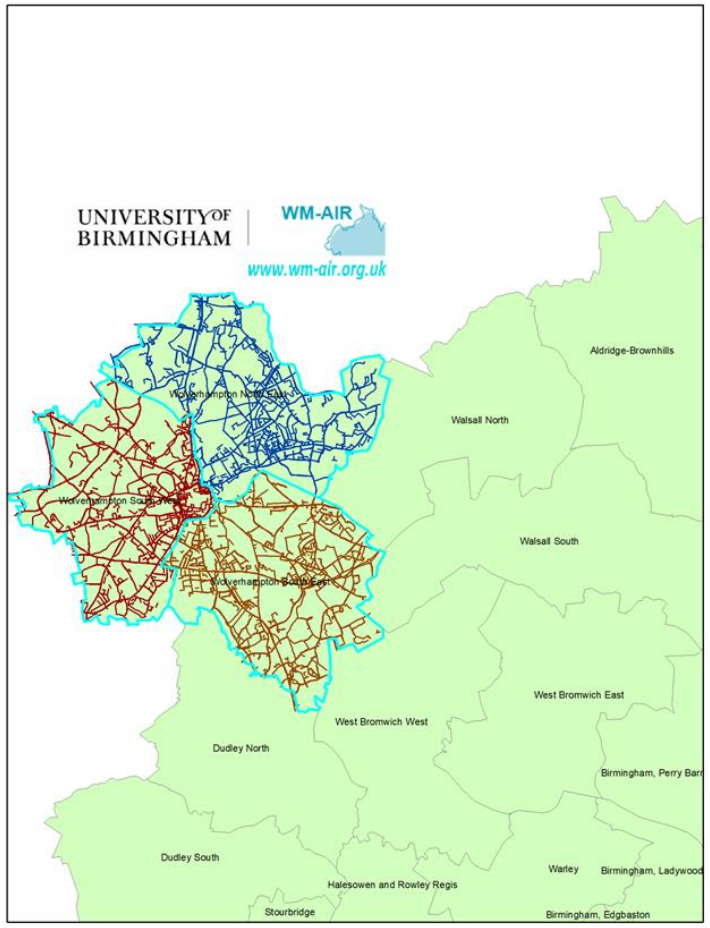
Acceleration/Deceleration

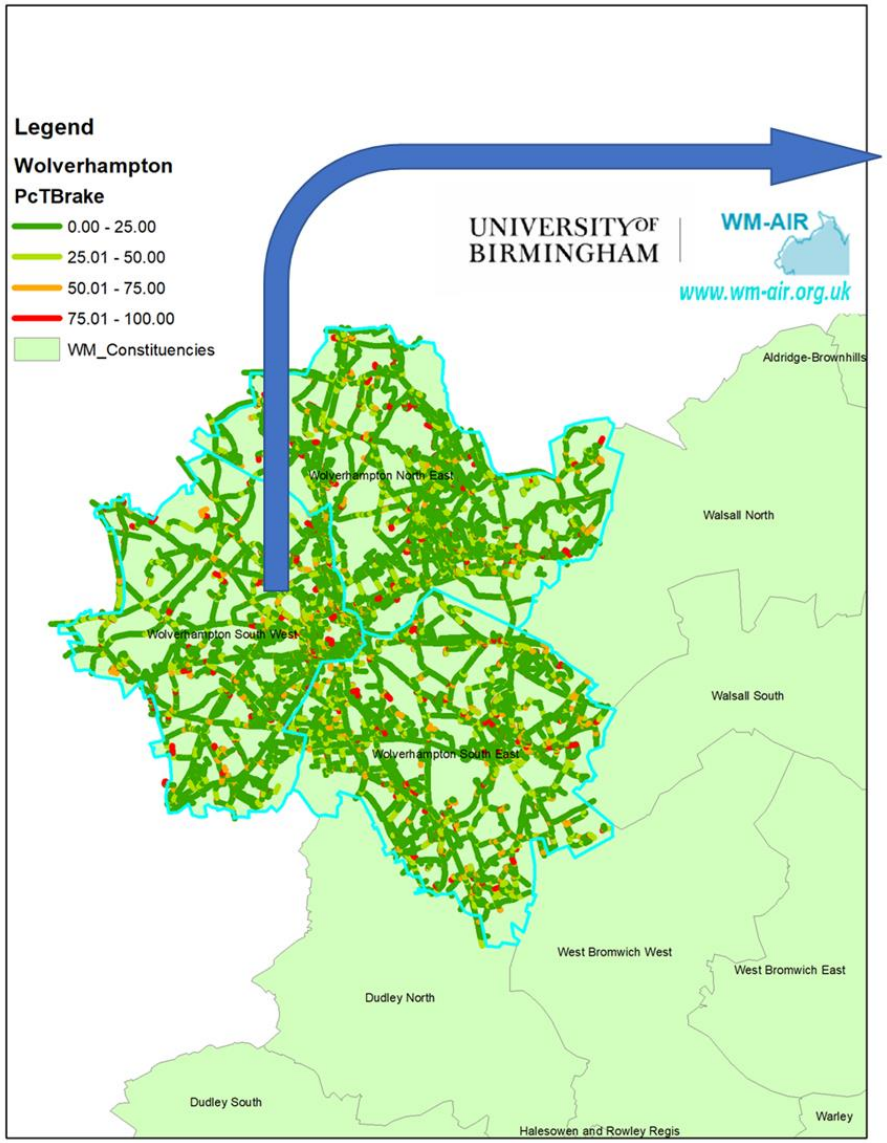
Speed

Mapping of Urban Mobility

Our calculations can be run at different resolutions

e.g. region, LSOA, ward to road segment

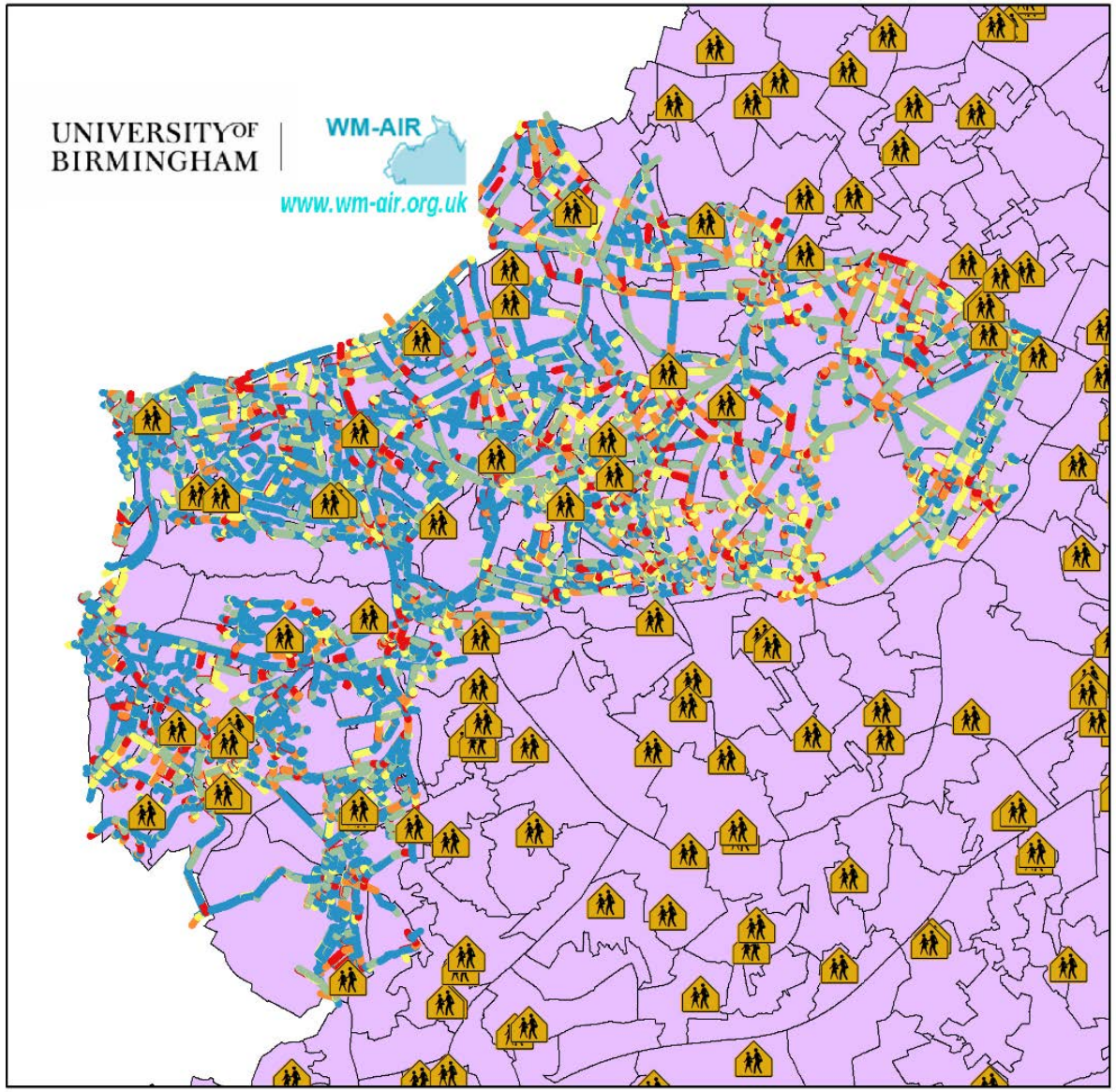


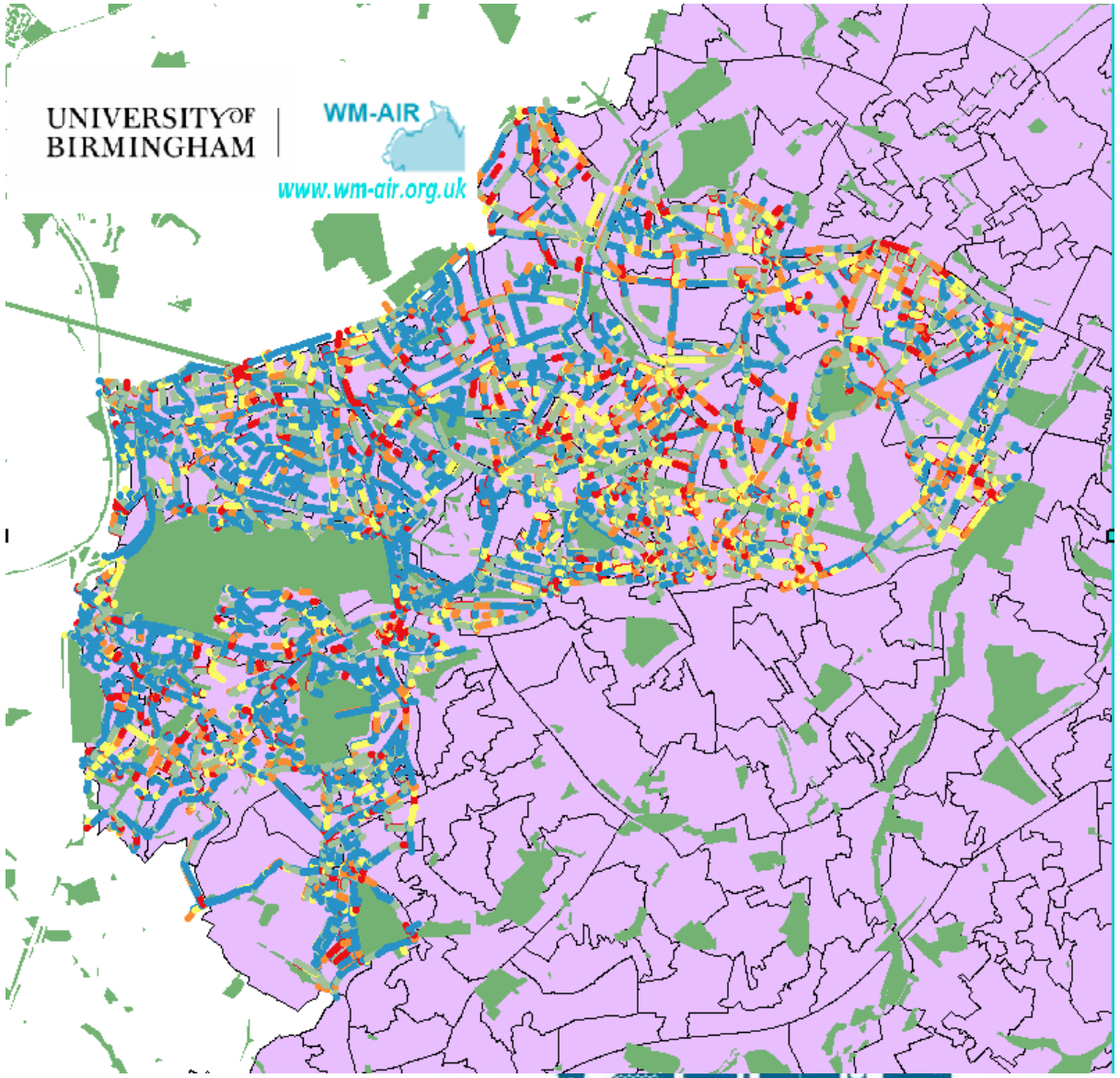


Fuel Consumption

- We can now calculate different dimensions of urban mobility in highly-detailed schemes.

Conceptualization of Spatial Relationships





The Benefits of Approach

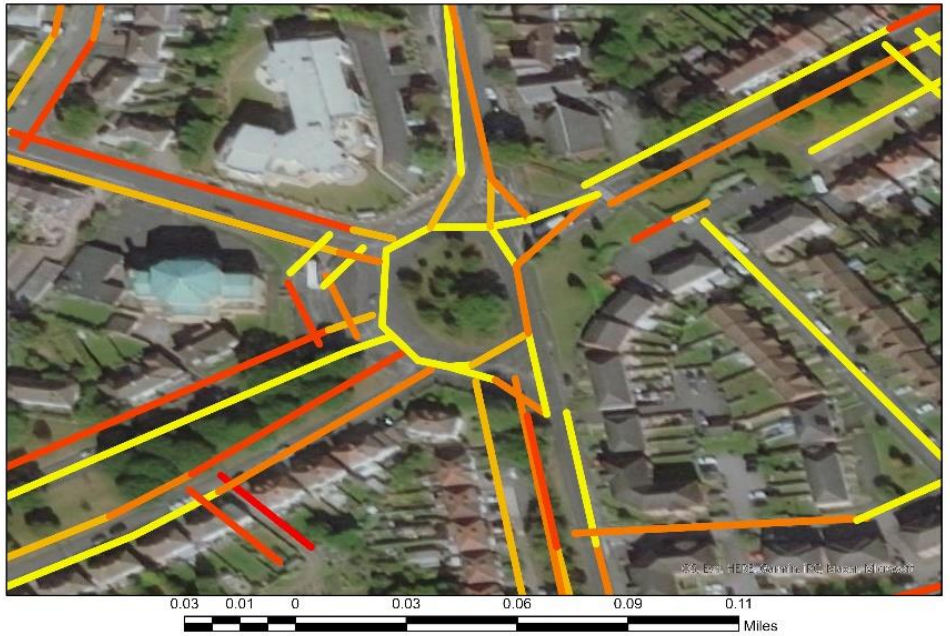
Improve the spatial and temporal resolution of the available emission inventories.

Designing emission mitigation scenarios

Hot spot analysis for local interventions

Provide data for existing traffic models and the other urban management programs

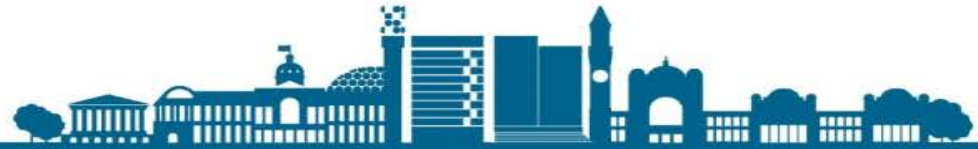
Real-world assessment of human behaviours toward external interventions e.g. COVID-19



Our future directions

The impacts of atmospheric events such as heat/cold waves and calendar events such as Christmas and school holidays could develop different dimensions of urban mobility

How urban features such as schools, green infrastructures, hospitals, etc., can influence the urban transport/mobility? Conceptualization and parametrization of spatial relationships

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