



Improving Air Quality In Cambridge – Issues and Actions

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Cambridge City Council

Outline

- 1. Monitoring, Modelling, Review and Action – Role of the local Authority**
- 2. Actions so far, Emission Factors,**
- 3. Current Commitments to be implemented**

21st Century Air Quality - Cambridge

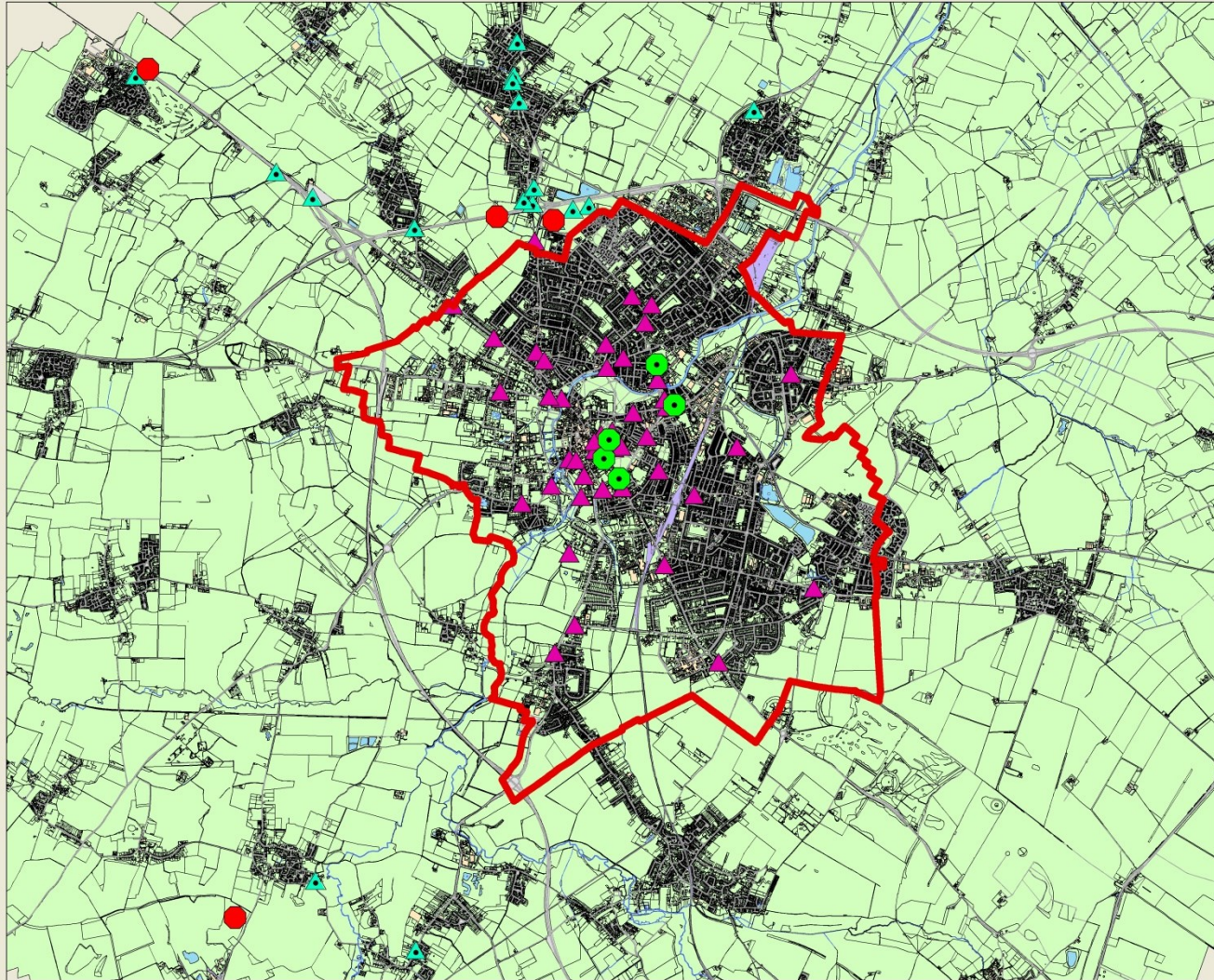
- No heavy industry
- Gas Heating systems dominate
- Road Traffic is the main local source of air pollution
- **Narrow congested streets in historic core**
- **Large commuter pull**
- **Very challenging population /employment growth**
- Nitrogen Dioxide and small particulates (PM10 / PM2.5) are the main pollutants of concern.
- PM 10 levels responsible for 20000-50000 early deaths per year in UK
- NO2 levels responsible for 20000+ deaths per year in UK
- 250 additional deaths per year in Cambridgeshire due to particulates (PHE)






Role of the Local Authority

- Duty to Review and assess air pollution (Environment Act 1995)
- Duty to take action in pursuit of national air quality objectives

What do we do

- Run and maintain an appropriate monitoring programme
- Develop and present modelled data to identify unmonitored problem areas and the extent of poor air quality
- Declare Air Quality Management Areas AQMA
- Work to identify local sources accurately
- Develop policy and partnerships to improve air quality



-  Cambridge City Boundary
-  City Council Continuous Monitors
-  SCDC continuous monitors
-  City Tube Coordinates 2009
-  SCDC Tube Coordinates 2009

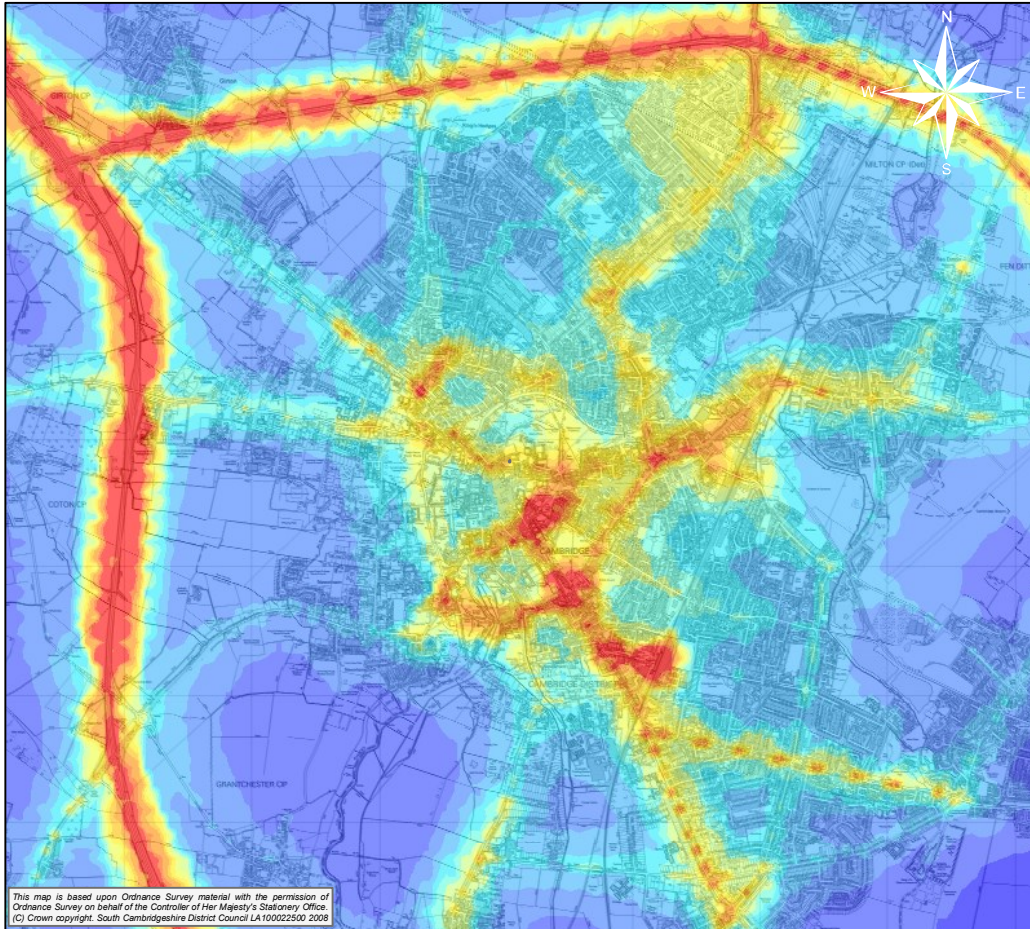


Monitoring Locations

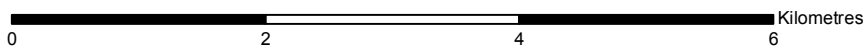
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Project Location & Name: J:\Projects\ArcGIS_Projects\Basemap; Layout Name: n/a

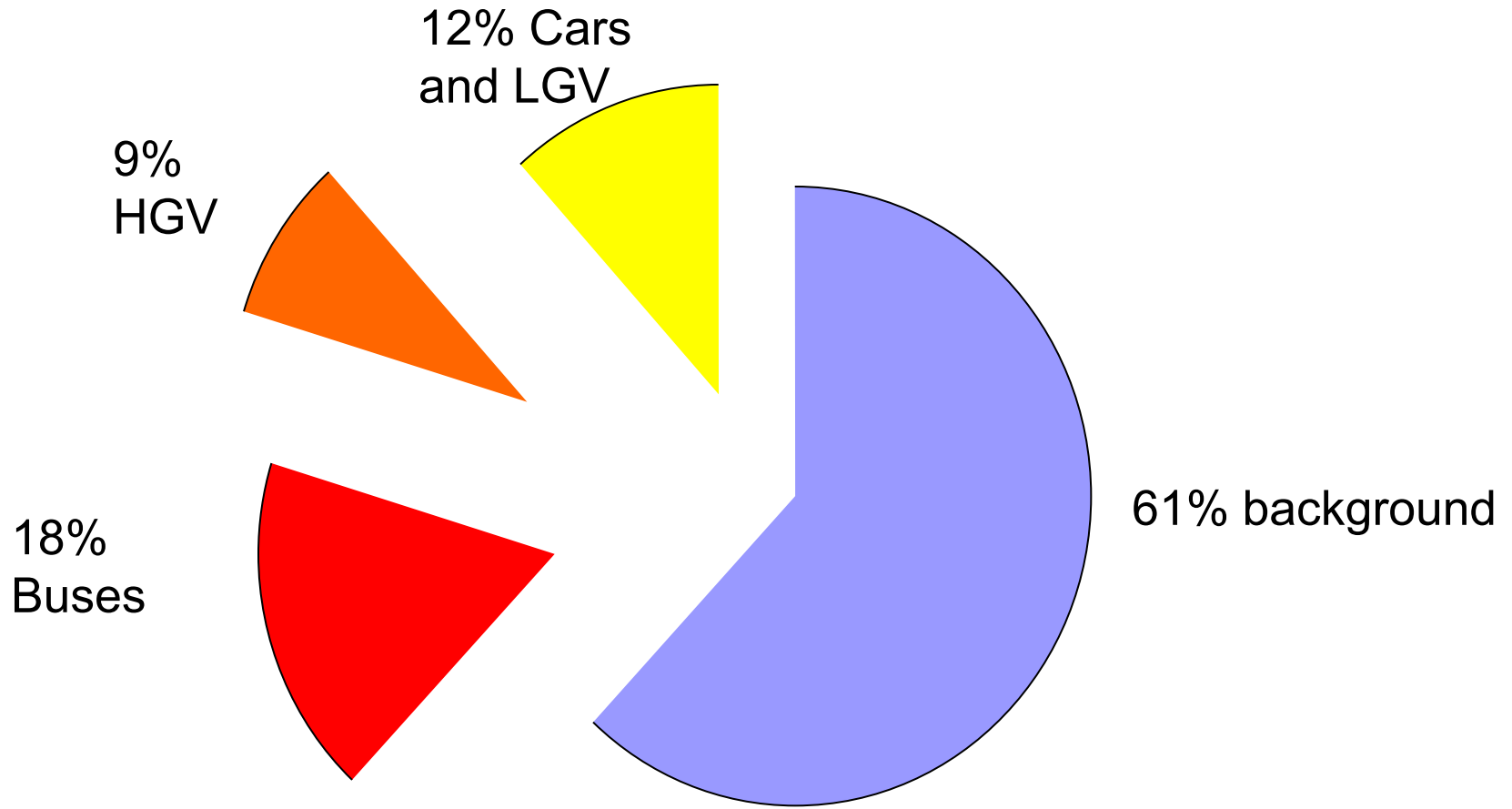
NO₂ Cambridge



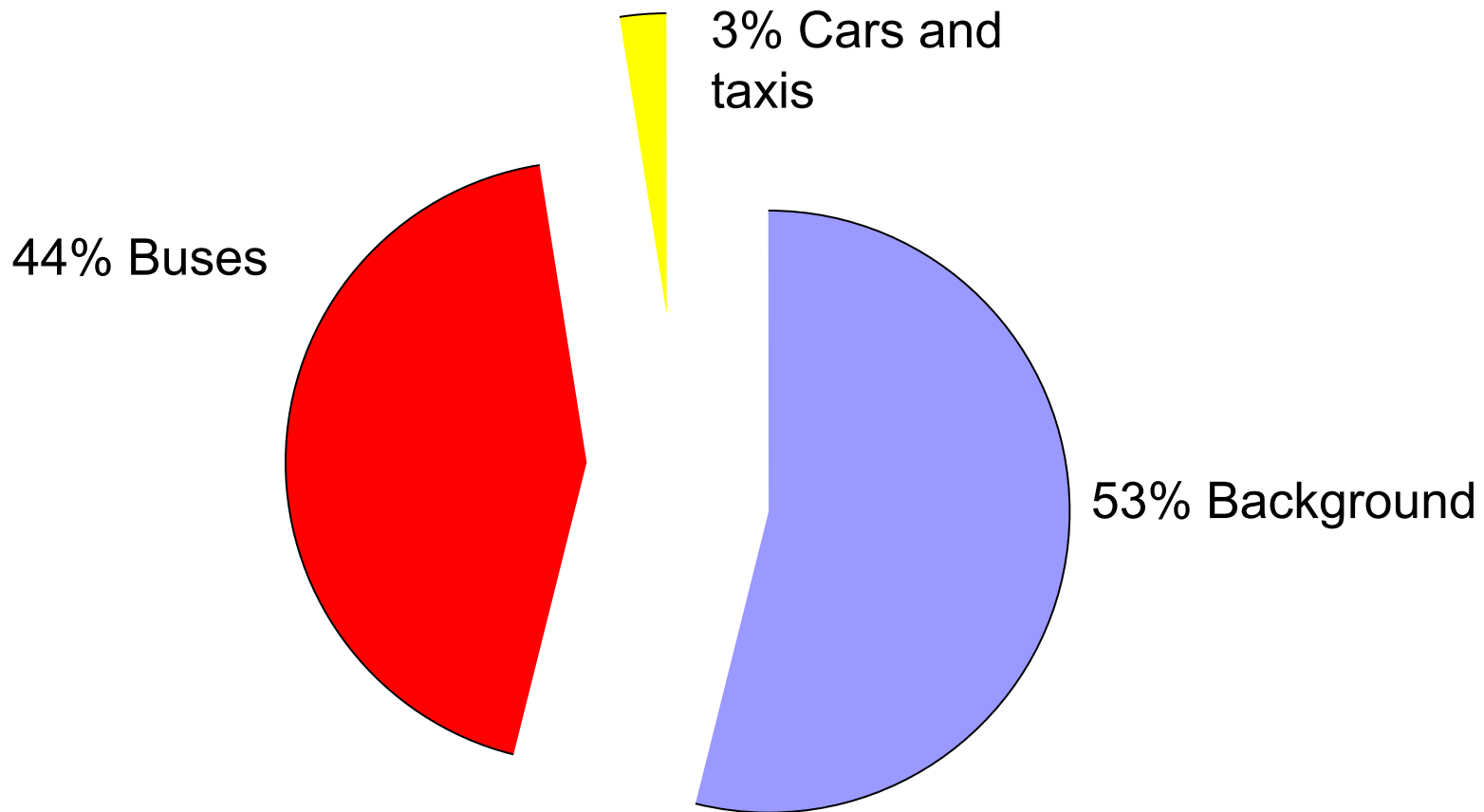
**NO₂ concentration
($\mu\text{g}/\text{m}^3$)**



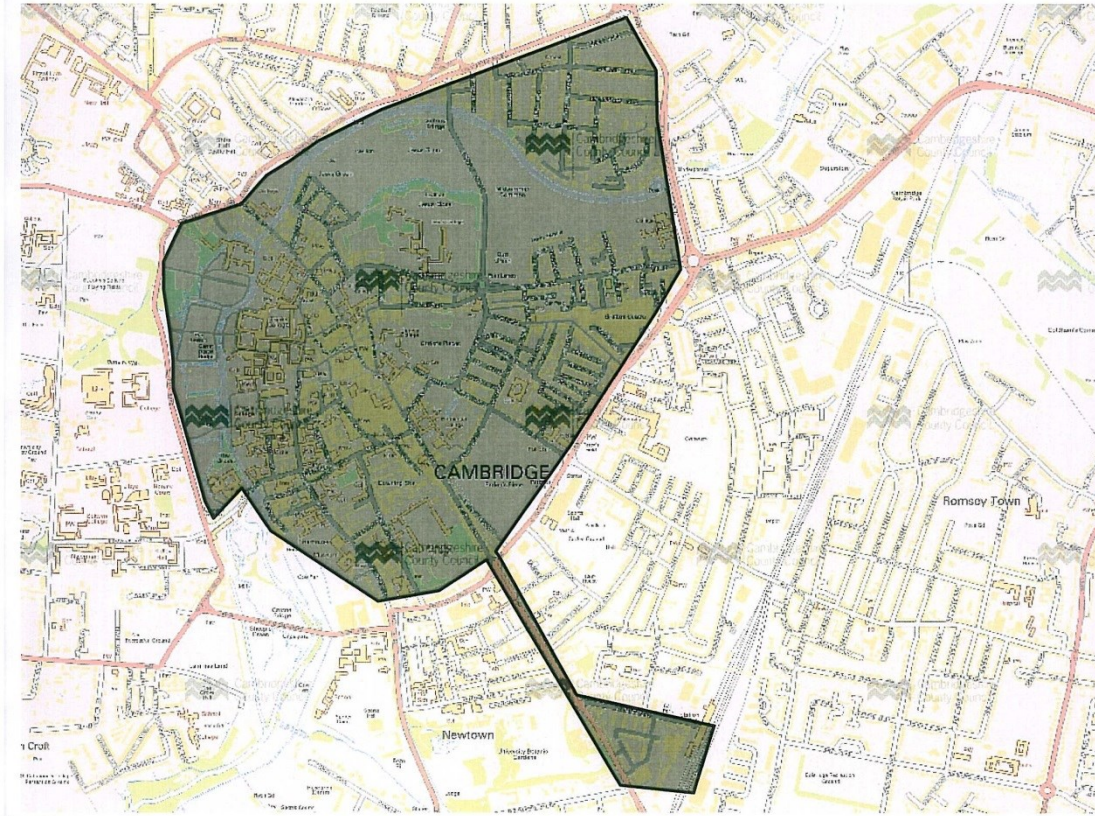
NO₂ Source Contribution Gonville Place/ Hills Road/ Lensfield Road/Regent Street



NO₂ Source Contribution Parker St / Drummer Street



Quality Bus Partnership



Calculated emissions in a fixed area

Operator nitrogen oxides (NO_x) budgets

Reducing each year

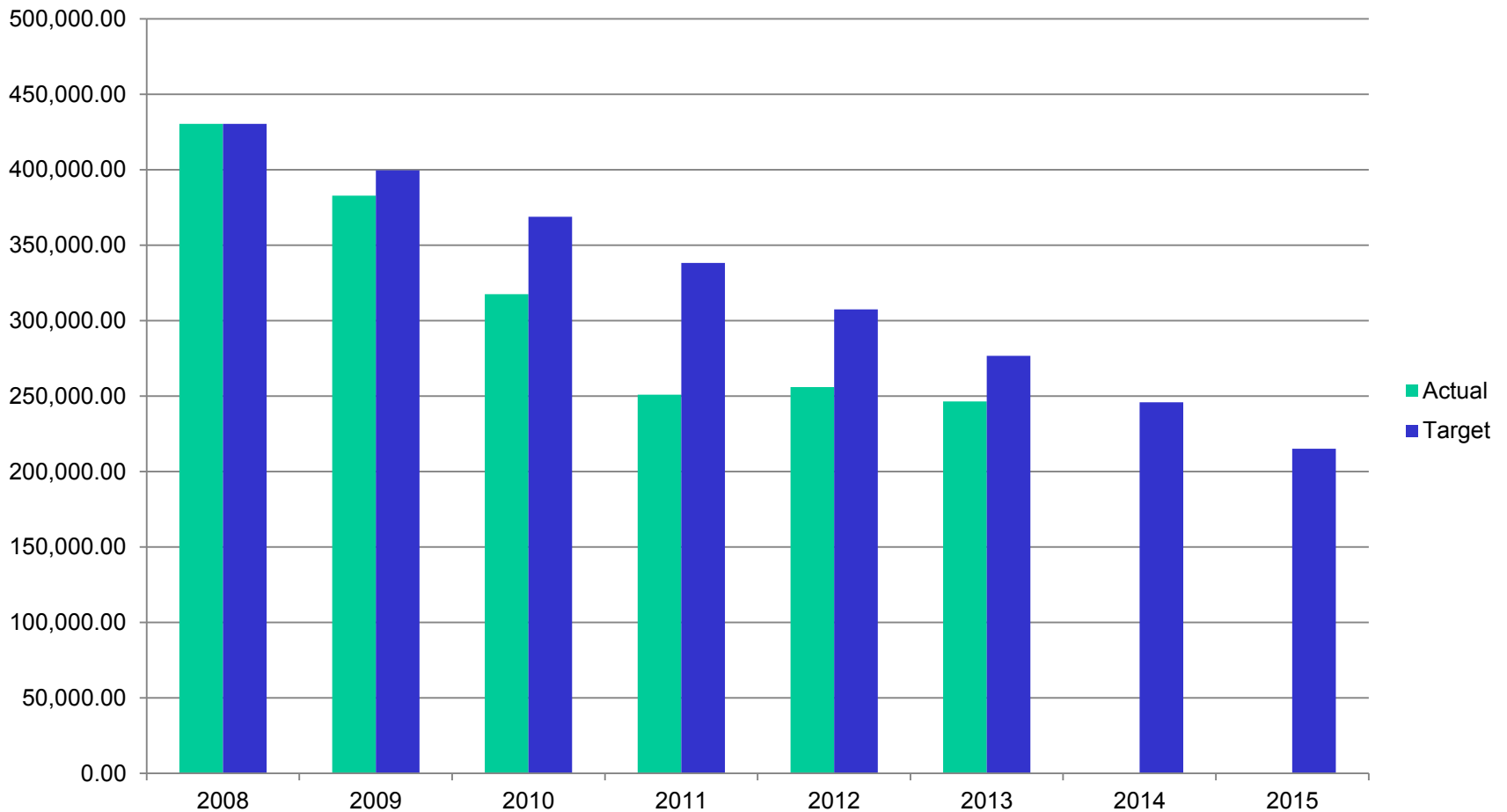
2008 baseline year

50% reduction by 2015 target year

Annual reporting requirement

Model predicted this would
Bring NO₂ below 40ug/m³

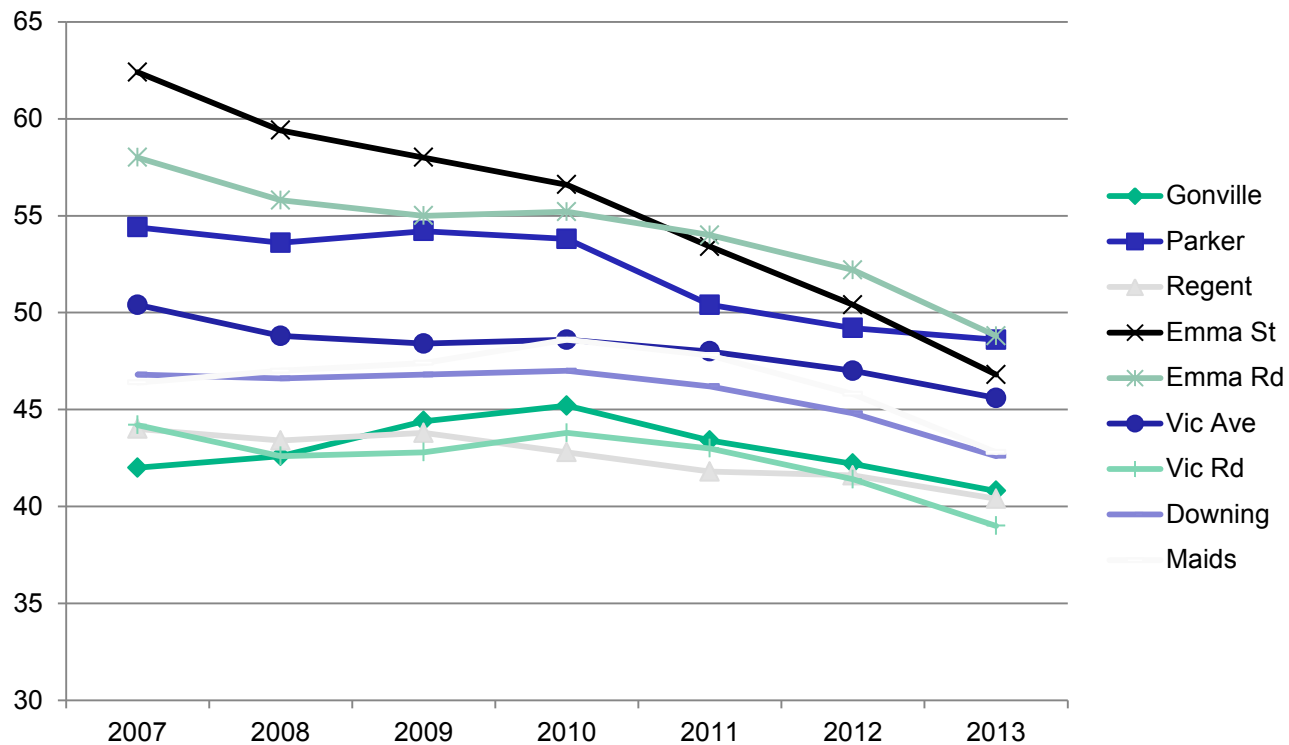
Update 2014 calculated NOx emissions, g/wk



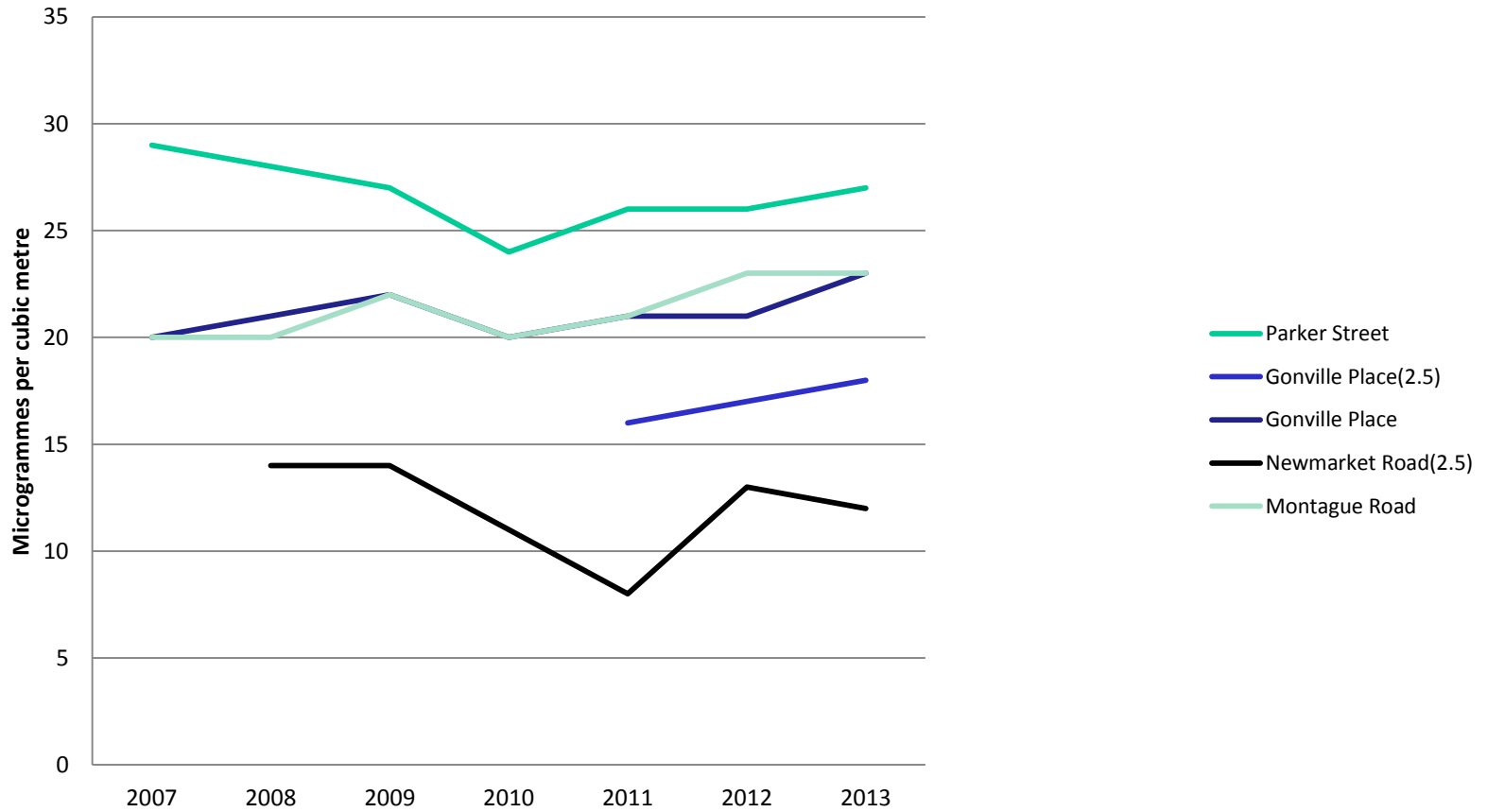
What has been Achieved

- The majority of the bus fleet has been improved over the period
- No pre euro 2 buses are in regular use in the city centre
- Over 88% Bus km in core area EU IV, V or VI
- Fleet miles in emissions envelope are slightly reduced
- Calculated emissions targets are close to or exceeding a 50% cut, but.... Expected NO₂ concentrations down by only 10% not the expected 25%

5 year rolling means NO₂



PM annual means 2007-2013



Real Emissions Project

- Successfully sought DEFRA Air Quality Grant Funding
- Worked with ITS Leeds University to select sites and carry out monitoring and analysis



Real Emissions Project

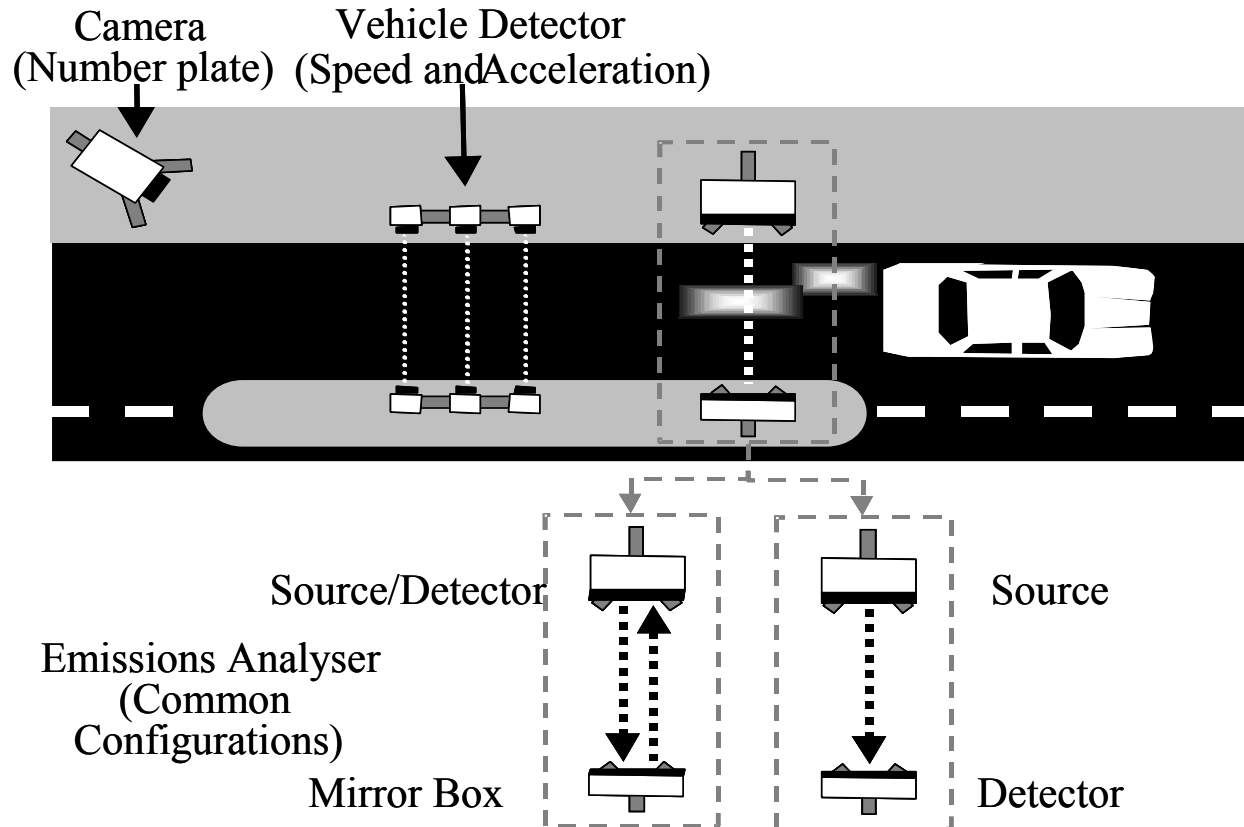
- Monitored using - AccuScan™ RSD-4600
- UV & IR Spectroscopy & Opacity measurement

ANPR used to identify vehicles and to cross-reference age, engine type, size and Euro Standard

- Specific aims:
 - to identify in operation emissions of the Cambridge fleet
 - Source apportionment in key locations

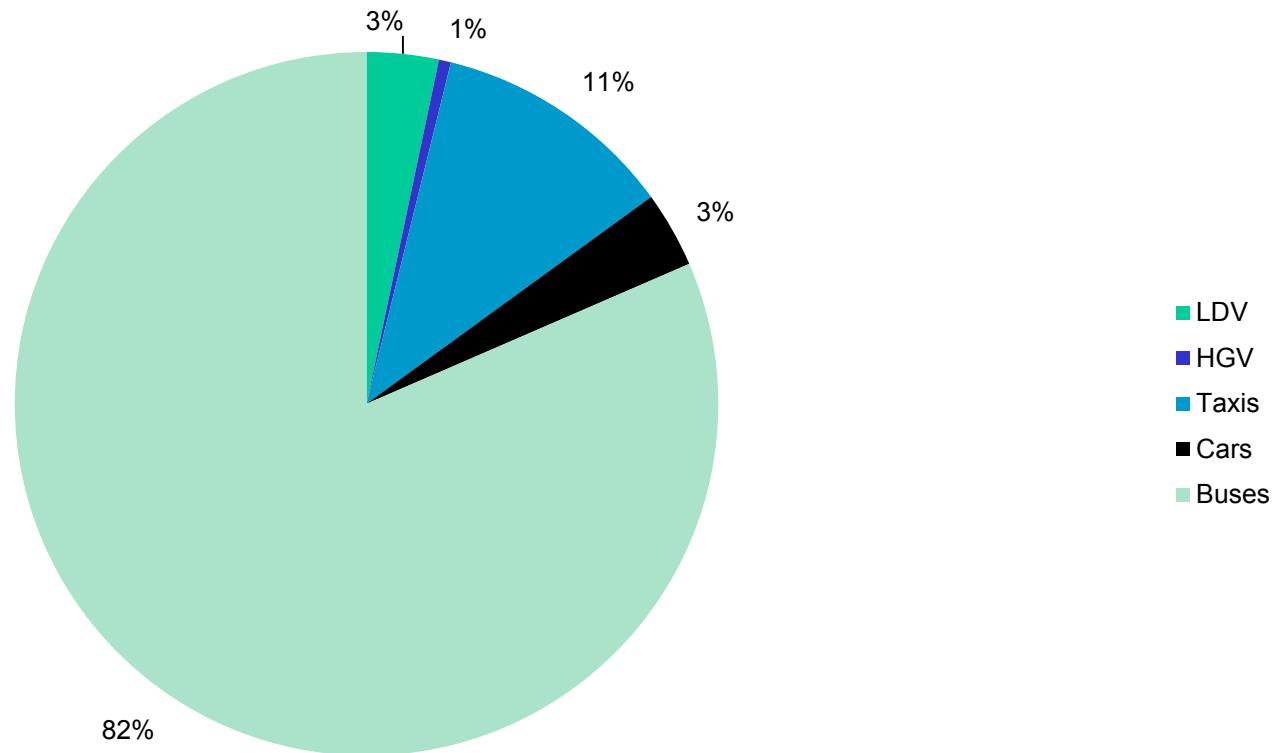


Real Time Emissions Monitoring



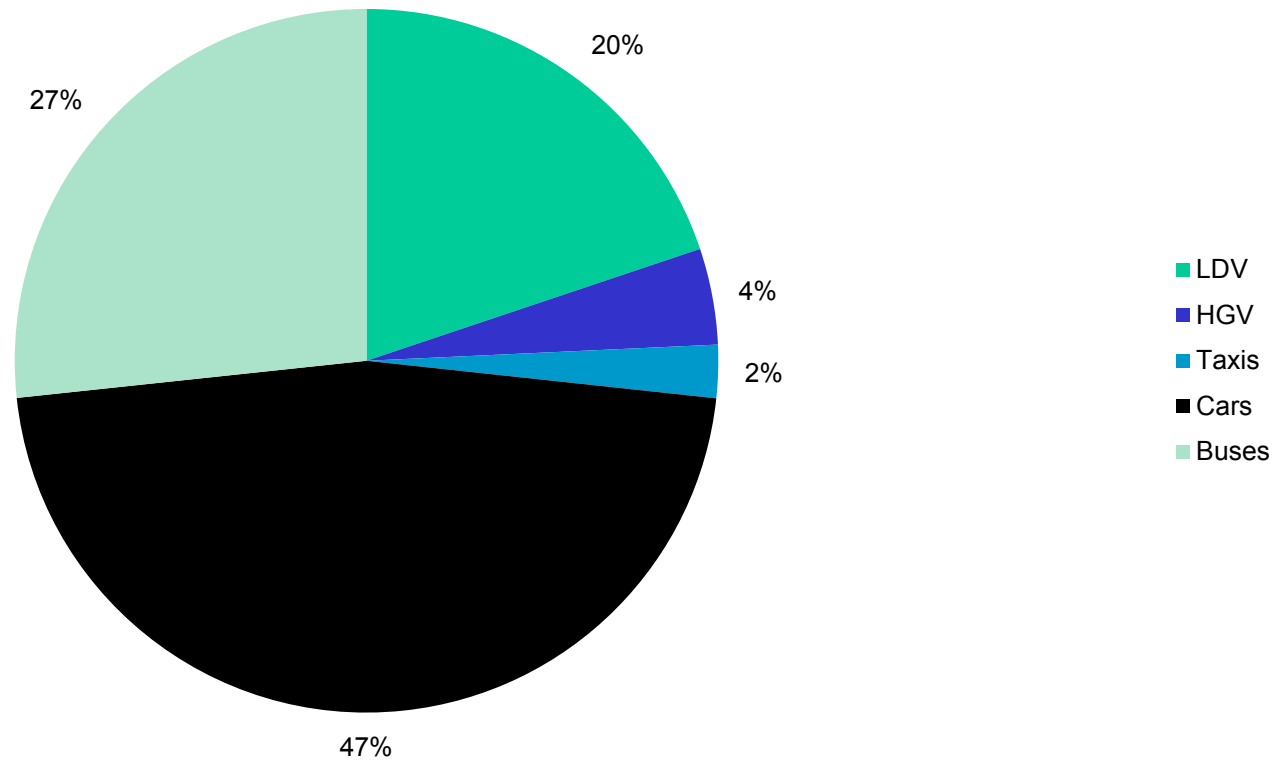
City Centre – NOx sources

contributions of NOx by vehicle type, King Street

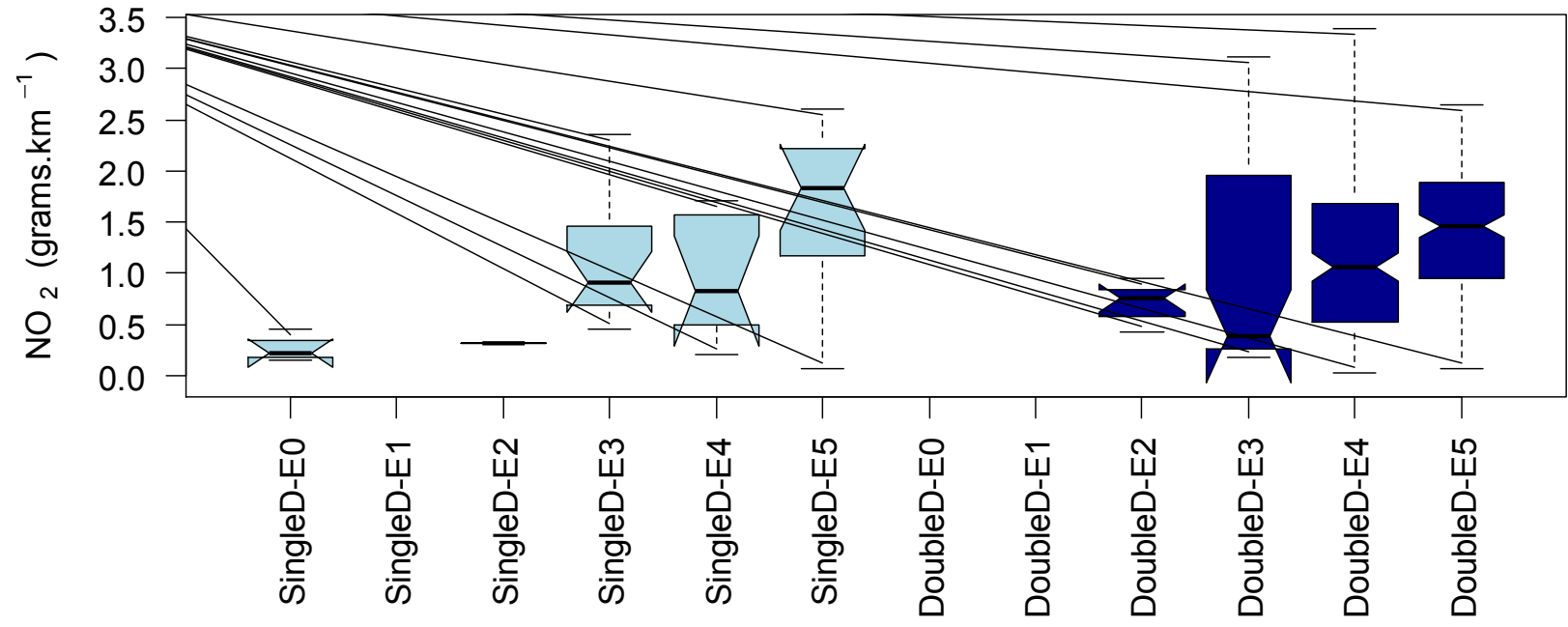


Feeder Road – NOx sources

contributions of NOx by vehicle type, Newmarket Road

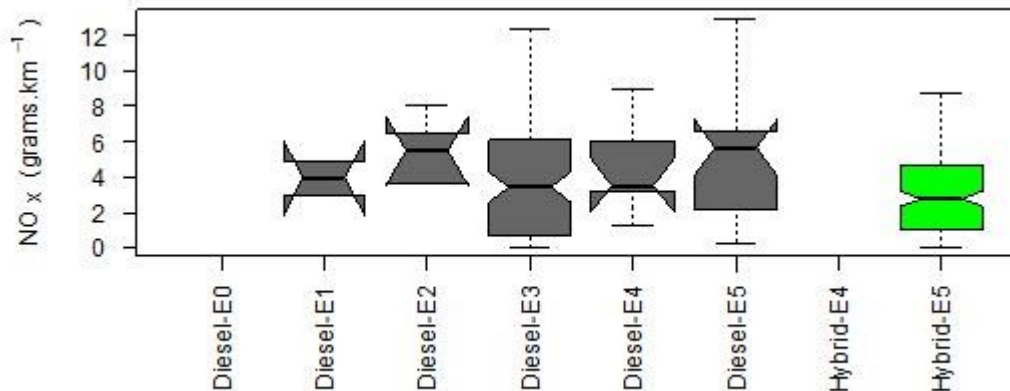


Bus Emission Factors Predicted NO₂ categorised Euro type



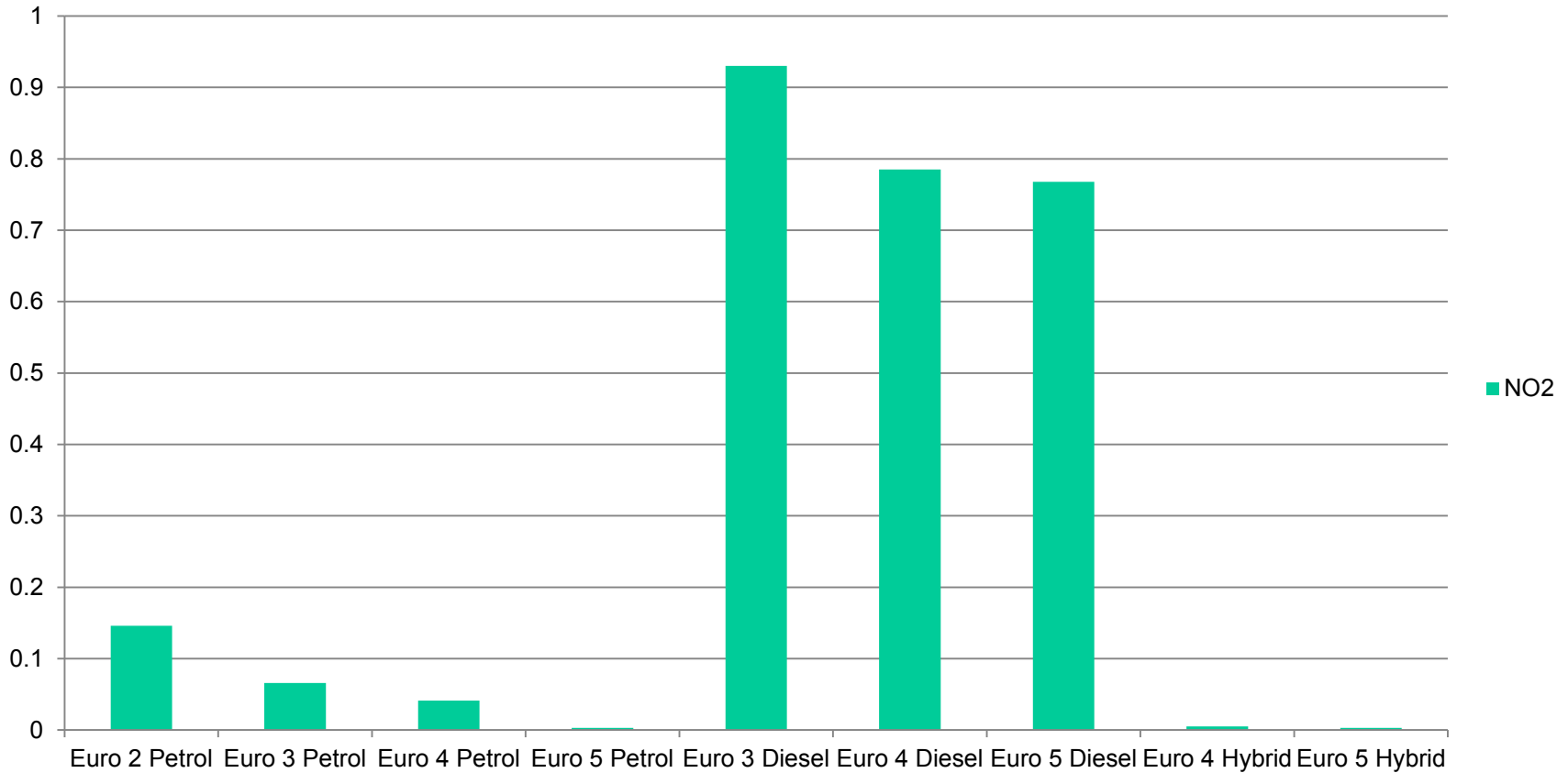
Bus Emission Factors Including Hybrids

The RSD assessment showed ~50% NO_x emissions of a comparable Euro 5 double-decker.



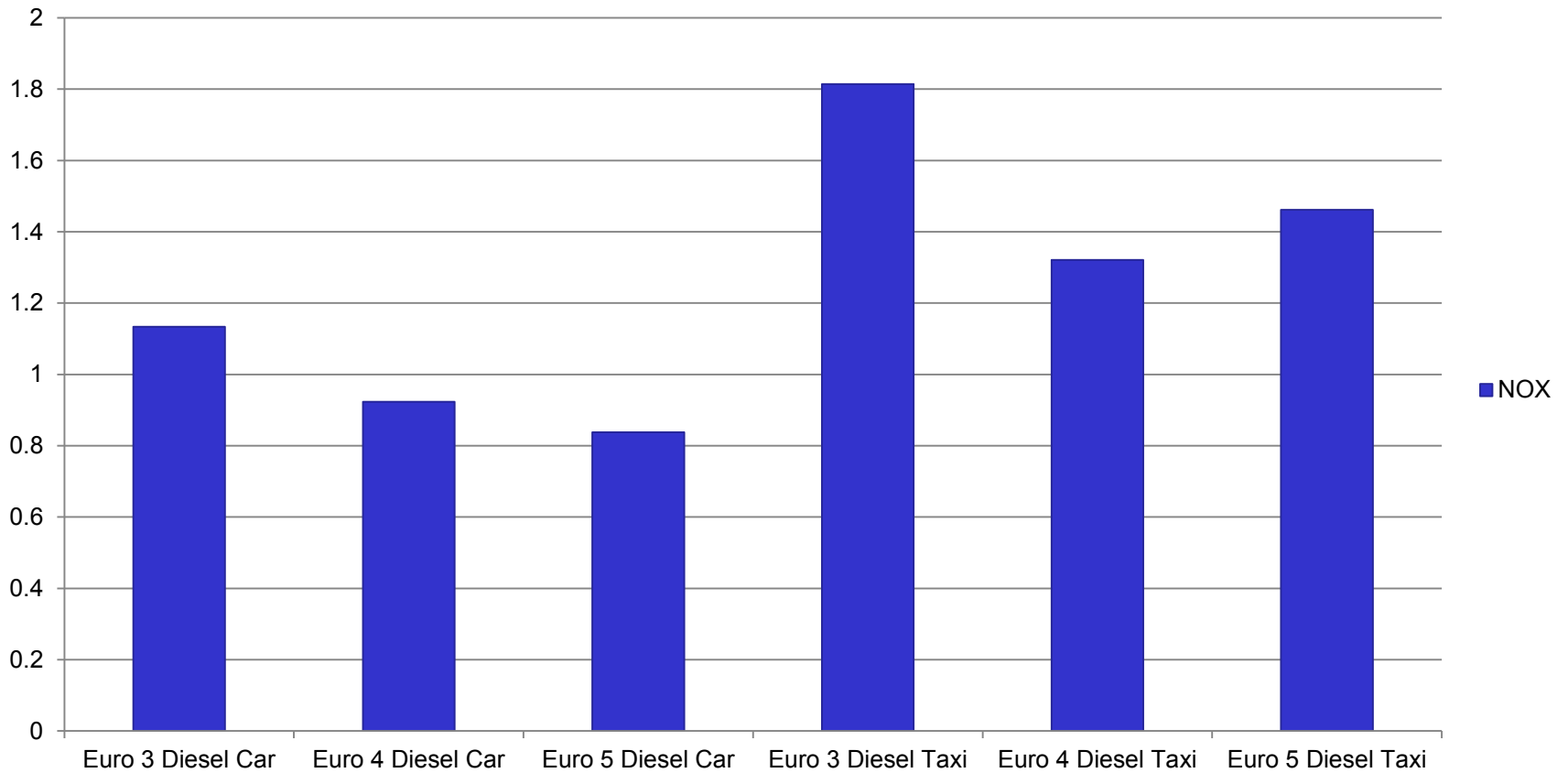
Petrol and Diesel v Hybrid Taxis NO2 emissions

NO2 g/km



Car emissions v Taxi emissions

NOX g/km



Strong Findings

- In terms of source apportionment our understanding was good but is now more detailed with the dominance of Bus emissions confirmed in the central area and the contribution of Taxis and Light goods vehicles now more apparent.
- The relationship between EURO Engine Standards and ‘in use emissions’ is poor and not as billed - particularly for larger engine diesel cars and buses
- The difference between the in service performance of petrol & hybrid vehicles in terms of NO₂ emissions compared to diesel engines is extreme

Current and Future Plans

- New draft action plan based around a shift to electric and ultra low emission vehicles
- Parallel bids to OLEV (Office for Low Emission Vehicles) for funding for:
 - EV Charging Infrastructure
 - Subsidy for Electric Hackney Carriage Purchase
 - **Unsuccessful** Grant funding for Fly Wheel / Hybrid Bus fleet (89 Buses)
- Developing Policy alongside City Deal Funding for Bus/vehicle access to City – ‘Potential Clean Air Zone’
- Working with County transport colleagues on new city centre access controls
- Looking at the feasibility of widespread public access EV Charging infrastructure

Current and Future Plans

- Cambridge City Council have consulted on and agreed plans for a transition to Hybrid and Electric Taxis.
- Commitment to consult on and implement that:
 - All new taxis to be low emission within 5 years;
 - Taxi License fees waived for early adopters;
 - All Cambridge licensed taxis to be low emission within 10 years
 - Rapid Charging infrastructure to be installed for Electric Taxis
 - Electric vehicle only taxi ranks
 - £100k capital and £150k revenue support for the transition

Potential Clean Air Zone

