



Cardiff Clean Air Feasibility Study

Welsh Air Quality Forum
9th October 2019



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Background

- The UK and devolved Governments have, since 2010, had a **legal obligation to achieve a nitrogen dioxide (NO₂) annual average limit value** of 40µg/m³ as set out in the EU Ambient Air Quality Directive (2008/50/EC) **in the shortest possible time.**
- The UK published an Action Plan in December 2015 that was **successfully challenged in High Court by Client Earth in 2016 for not meeting the requirements of the Directive.**
- As a result of the High Court Ruling the UK Government had to redraft and a new UK Action Plan was published in July 2017 - **identified Cardiff as an area with persistent non compliance beyond 2022.**



The Client Earth Challenge

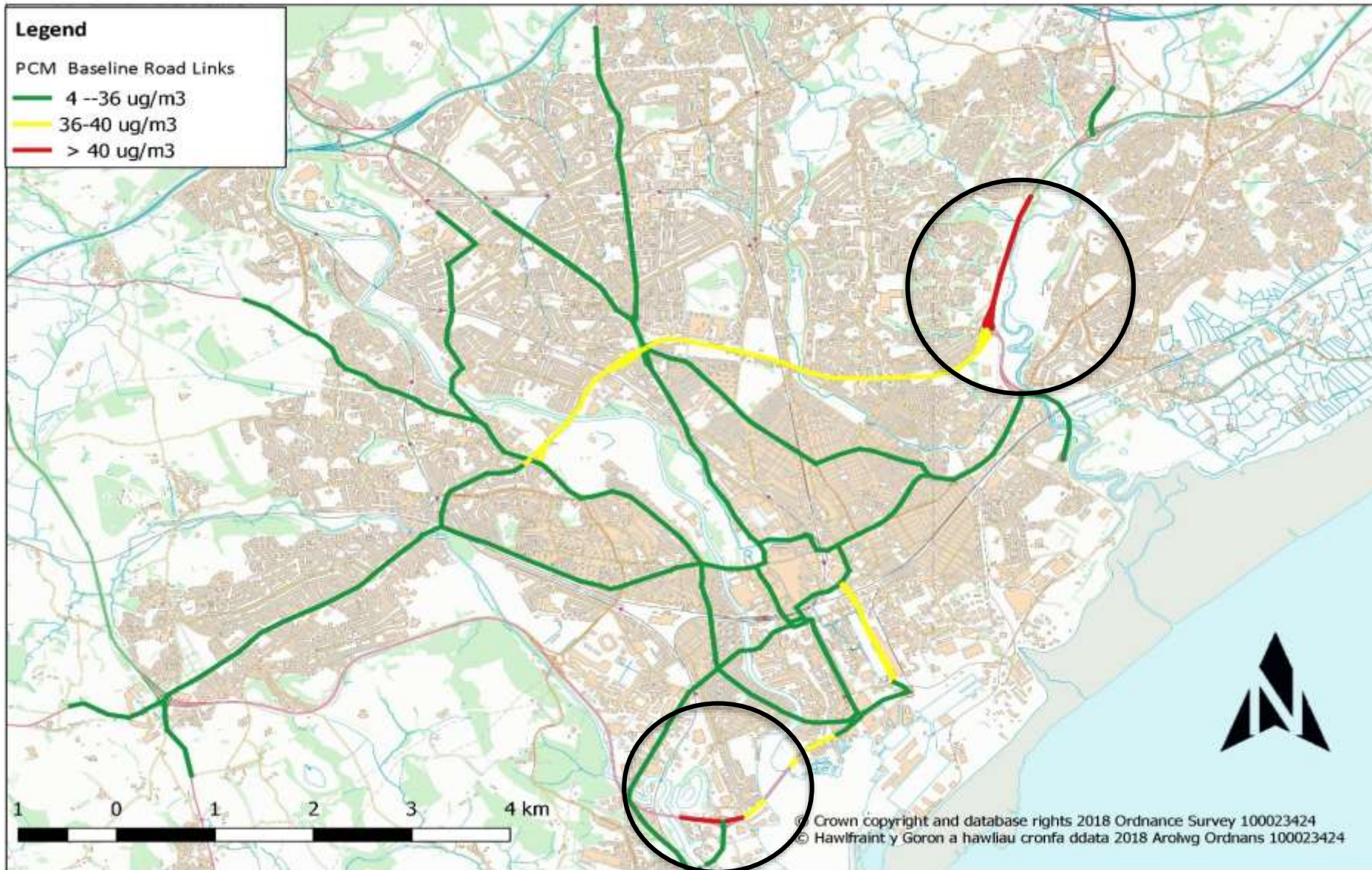
- The 2017 UK Action Plan was further challenged by Client Earth and in January 2018 Welsh Government agreed to a legally-binding 'consent order' with Client Earth.
- This resulted in a Legal direction being served on Cardiff Council under Part IV of the Environment Act 1995, Section 85(7) instructing Cardiff to:

“Undertake a feasibility study, to identify the option which will deliver compliance with legal limits for nitrogen dioxide in the area for which the authority is responsible, in the shortest possible time.”

- Cardiff Council are therefore **legally obliged** to introduce measures to mitigate against noncompliance in the **shortest possible time** – it is not a matter of discretion or choice.



The National Model Results



Elements of the Feasibility

- Transport modelling
 - Base year
 - Target year – baseline or do minimum
 - Target year – CAZ scenarios or do something

- **Air quality modelling**
 - Base year
 - Target year – baseline or do minimum
 - Target year – CAZ scenarios or do something

- Economic and social impact assessment

- Business case



The Modelling System Used

South East Wales Transport Model

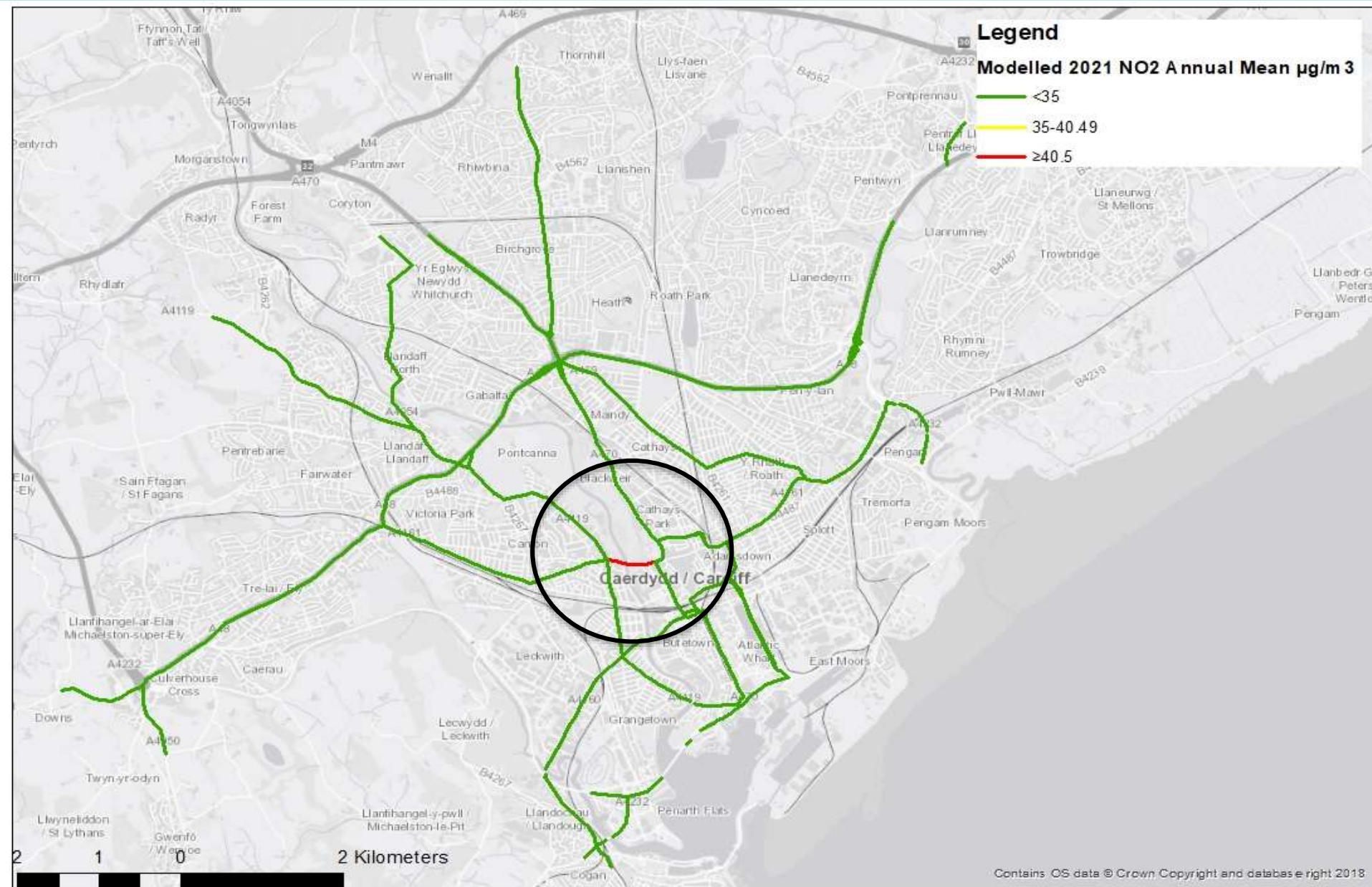
- Traffic flows
- Traffic speed
- Some 10,000 road links

The RapidAir emission and dispersion modelling system

ANPR data for local
fleet composition



The Local Baseline Model Results

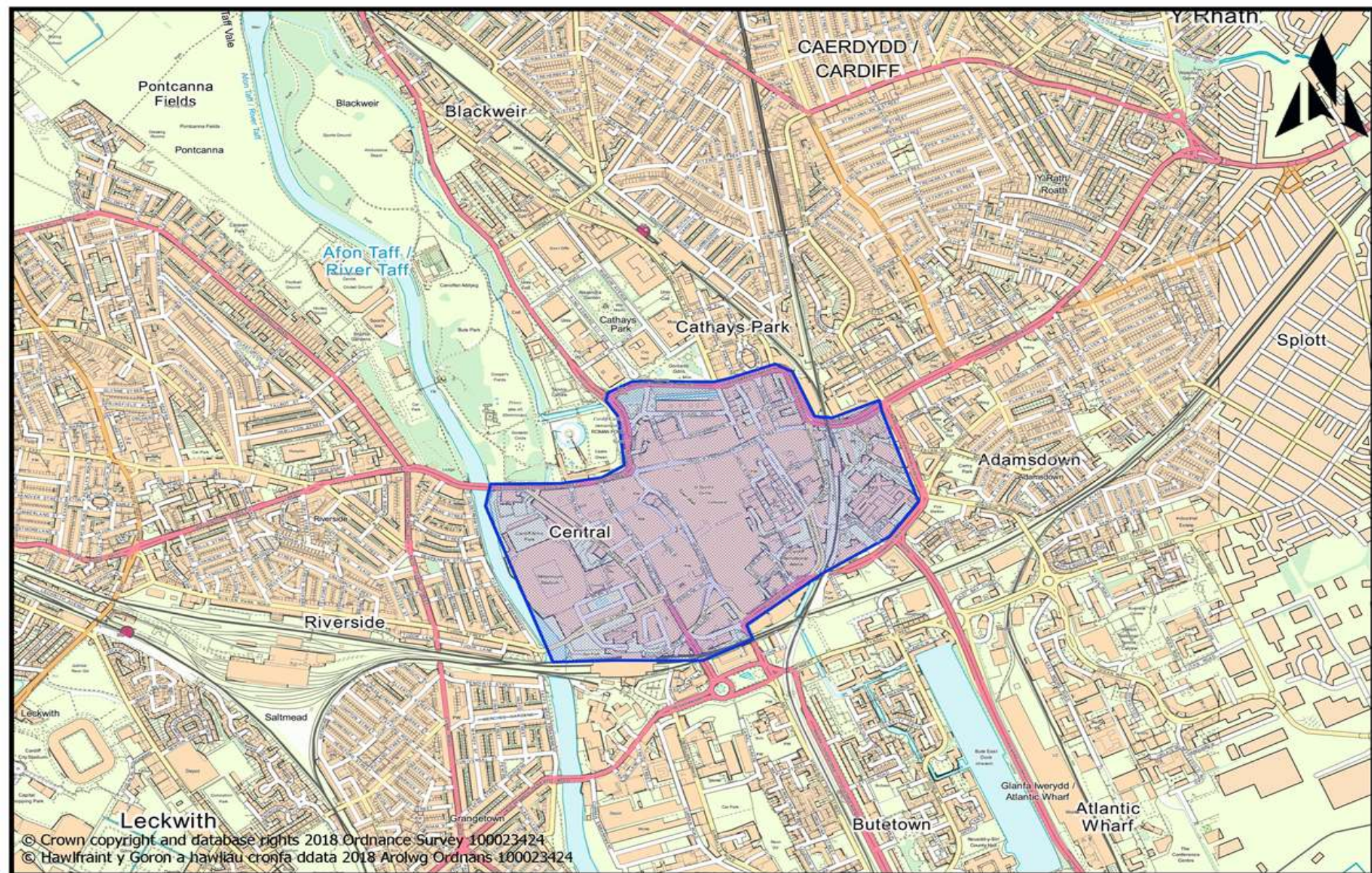


Options modelled

- A **Clean Air Zone (CAZ)** must be analysed as a compliance benchmark against against which other measures are compared:
 - CAZ 1 – targeting private cars
 - CAZ 2 – targeting HGVs
- A package of non-charging measures based on the Councils **Clean Air Strategy Action Plan (CASAP)**
 - 3 packages assessed
 - Final package developed as preferred option



The CAZ boundary



Preferred Option Modelled

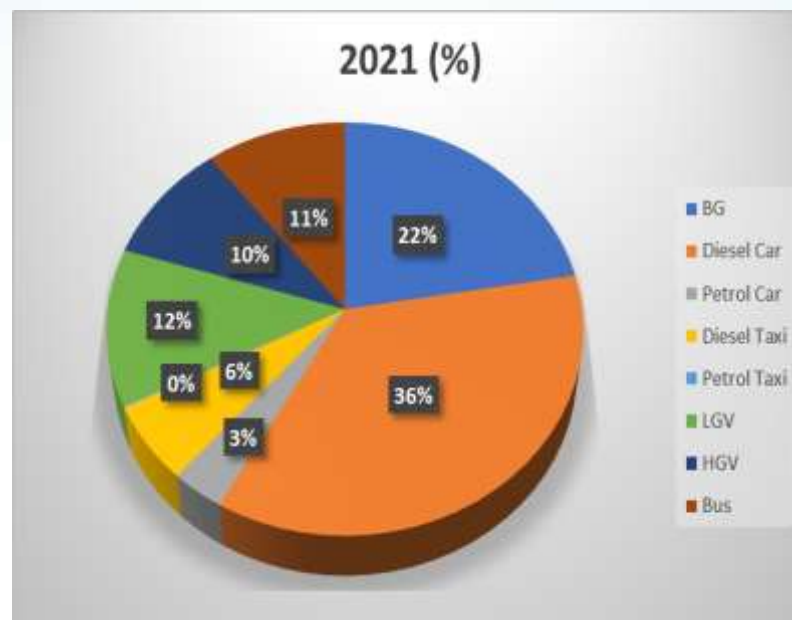
- **Electric Buses** – 36 Buses to be Implemented and bus fleet adjusted to reflect the removal of 36 older Euro3 vehicles.
- **Bus Retro Fitting Scheme** - Assumed 80% uptake of retrofit of remaining non-Euro 6 buses to Euro 6, to complement the electric buses measure above.
- **Taxi Licensing Policy and Mitigation** - Taxi fleet adjusted to remove all vehicles over 10 years old and replace these by new Euro 6 vehicles.
- **City Centre Access Management Schemes** – designed to reduce traffic on Castle street
- **Active Travel Measures** - 20mph zones and cycle scheme CS1 (Heath to City centre corridor)



Results for the Modelled Options

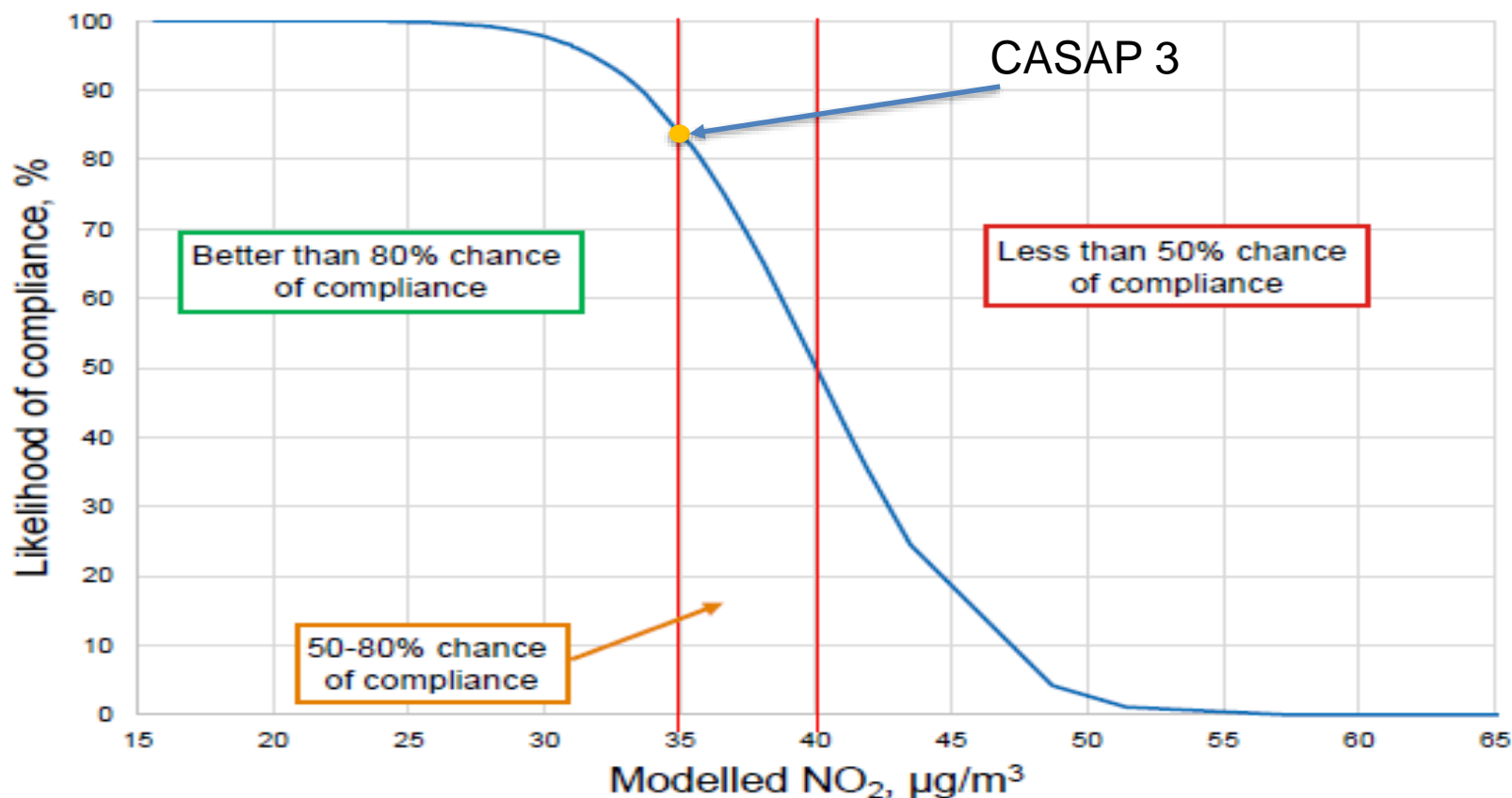
NO₂ concentration on Castle Street, ugm⁻³

BAU	CAZ1	CAZ 2	CASAP1	CASAP2	CASAP3	CASAP final
41.1	32.5	35.3	37.3	36.0	35.0	31.9

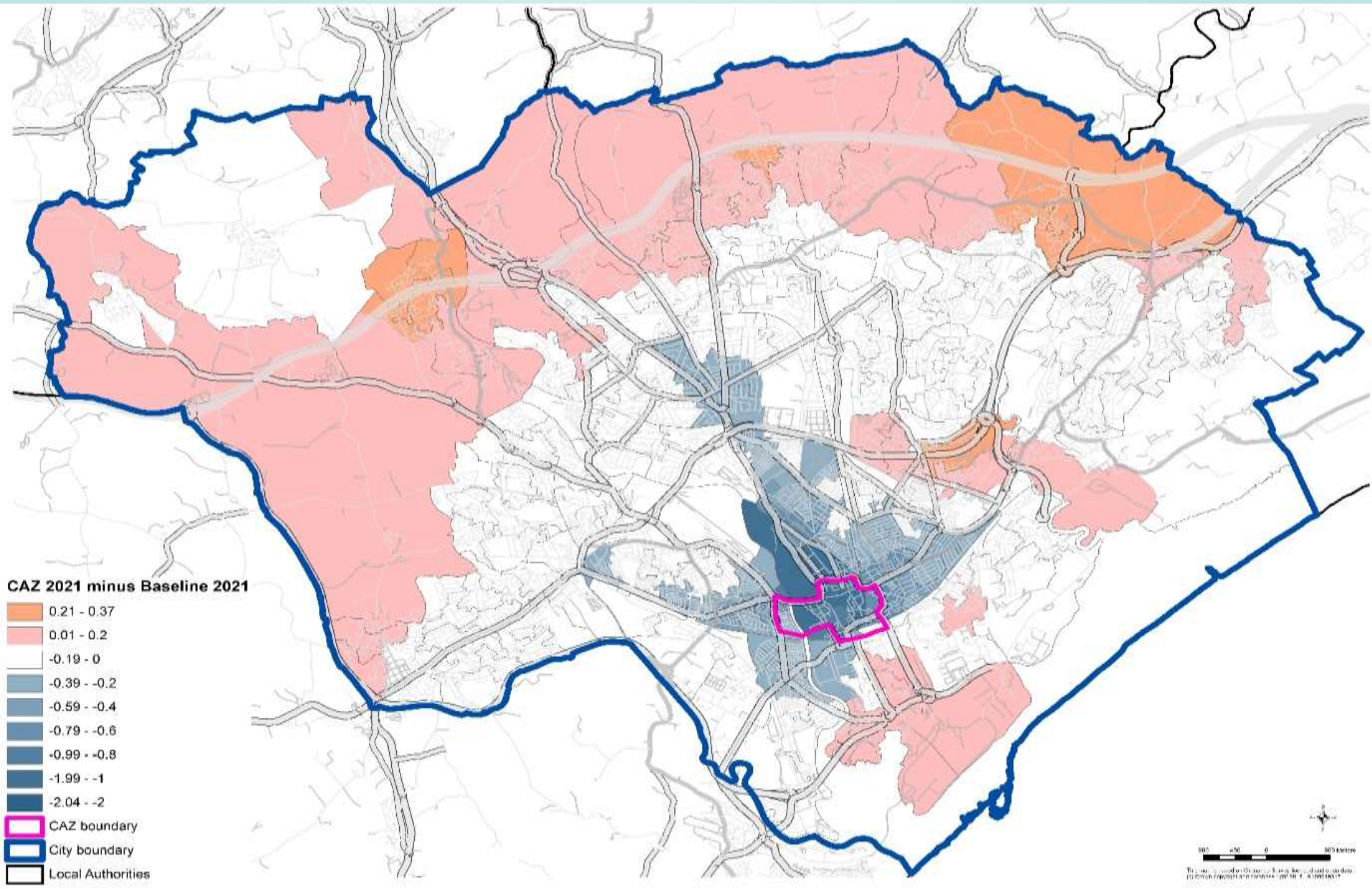


Understanding Uncertainty

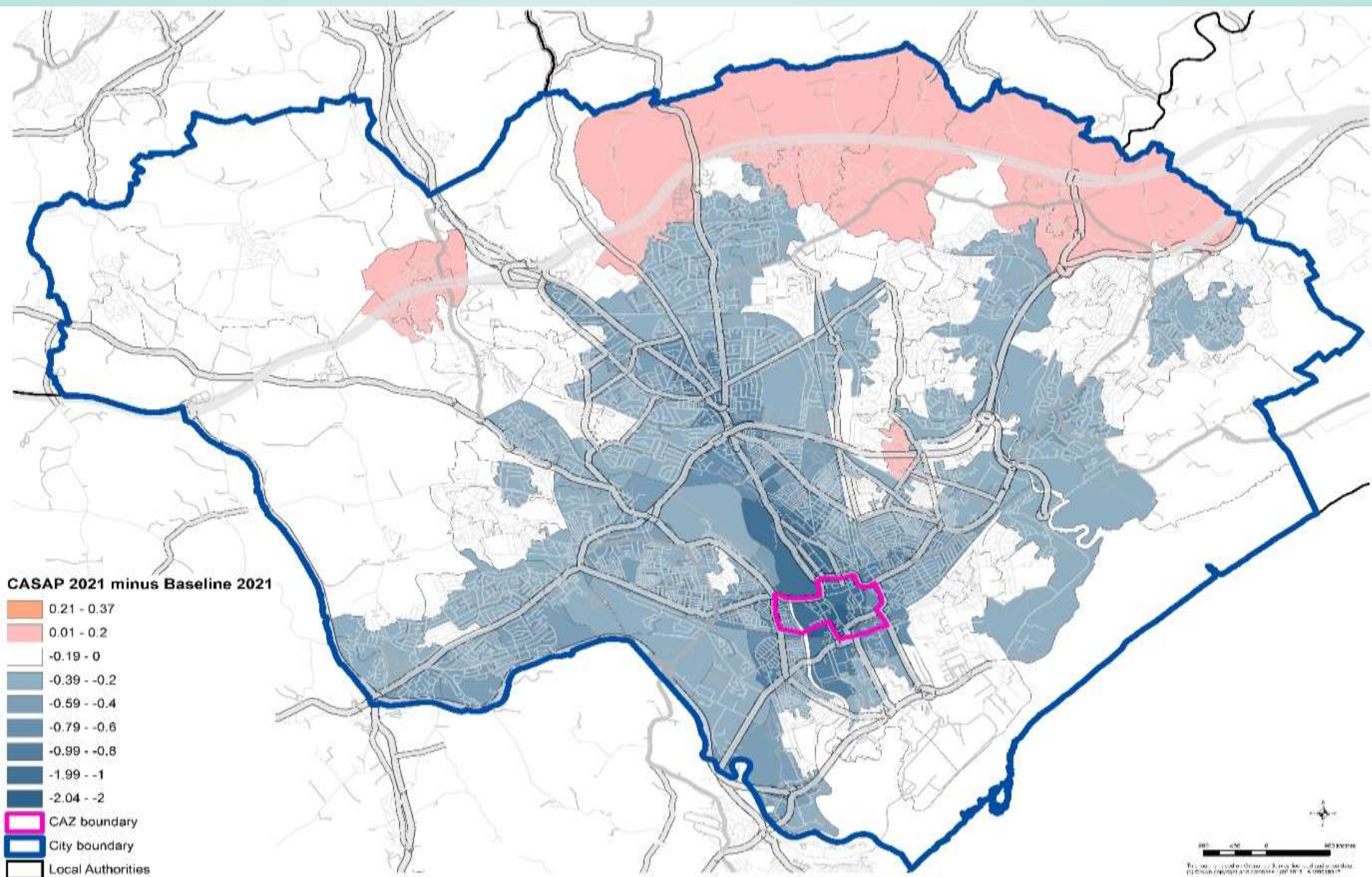
Model error is an RMSE (root mean square error) of $5 \mu\text{g}/\text{m}^3$ which gives the following probability distribution



Distributional Impact of CAZ 1



Distributional Impact of Final CASAP Option



Summary of Key Points

- **2021 baseline does not comply with the EU annual mean NO₂ limit value with out further interventions.**
- The modelling of the **preferred option indicates compliance with the limit in 2021.**
- **Most deprived part of the population would see the greatest improvements from the preferred option**
- The non charging package will deliver wider air quality benefits, and further reductions of emission such as PM2.5. **The CAZ scenario leads to an increase in PM2.5 emissions.**
- The **CAZ would place direct costs on households**, where as the main impact of the CASAP measures is increase journey times.
- The **preferred package will be quicker to implement than a CAZ** and so achieve compliance in the soonest possible time.

**Preferred option has now been
accepted in principle by Welsh
Government**



Beyond Compliance - Clean Air Strategy

- An overarching Clean Air Strategy and Action Plan sets out longer term measures intended to further improve AQ and satisfy LAQM requirements.
- Measures are included that are unlikely to have immediate impact on area of non-compliance, but likely to provide further AQ improvements including AQMAs such as:
 - Implementation of Non Idling Zones
 - Living Walls and other Green Infrastructure
 - EV Infrastructure and Council Fleet Measures
 - Car Clubs with Low Emission/ Zero Emission Vehicles
 - Air Quality Planning Guidance
 - Schools Active Travel
- Ambition is to reduce NO₂ and other pollutants as low as reasonably practicable to protect and improve public health

