

Appendix 1-Summary of results from Low Emission Zone Feasibility study

Bath Low Emission Zone Feasibility Study (May 2014)

B&NES Council has received DEFRA funding to undertake a feasibility study for the introduction of a Low Emission Zone (LEZ) or other restrictions in the vicinity of the A36 Cleveland Bridge, Bath and model options for a reduction in heavy goods vehicles and engine standard stipulations.

The aims of the study were:

- to identify to what extent the implementation of a Low Emission Zone would reduce levels of nitrogen oxides and fine particulate matter;
- to identify the costs of introducing and managing an LEZ;
- to identify options relating to the extent of the zone;

Elements of study:

A range of models were used:

- **S-Paramics traffic model** provided data for emissions and dispersion models
- **Instantaneous Emissions Model (PHEM)**- outputs estimated the total 'source' emission of various pollutants for each link in each hour;
- **Dispersion modelling (B&NES)**- 'ADMS Urban' provides predicted concentrations at specified points and across wider areas

In addition there was consultation with HGV operators, bus companies, neighbouring authorities and the Highways Agency. A cost benefit analysis was also carried out.

Scenarios tested:

Using the modelling techniques, 5 options were tested, including the current baseline situation ('do nothing option'):

- **Do Nothing:** No changes assumed except Rossiter Road scheme and the effect of growth 2012-15
- **Option 1:** HGV: Only Euro-class 5 or better for the A4 London Road and Bathwick Street - 24hr restriction
- **Option 2:** HGV/Bus: Only Euro-class 5 or better for London Road and Bathwick Street - 24hr restriction
- **Option 3:** HGV: Only Euro-class 5 or better for London Road and Bathwick Street - between 3pm and 10am, lesser standard permitted between 10:00am-3:00pm
- **Option 4:** HGV/Bus: Euro-class 5 or better for 'Central Area' - inside A36

Assumptions made:

- No diversions as a result of the LEZ to alternative routes e.g. A350 through Wiltshire
- All vehicles in LEZ options will be fully compliant with Euro engine standard stipulations

Headline results:

- NO₂ emissions reduced by 7% in 'do nothing' option 2012-15
- NO₂ emissions reduced by 7% in option 2 and 6% in option 4 compared to 2015 'do nothing'
- PM10 emissions reduced by 43% in 'do nothing' option 2012-15

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- PM10 emissions reduced by 25% in option 2 and 21% in option 4 compared to 2015 'do nothing'
- **BUT THIS DOES NOT TRANSLATE TO RESULTING PREDICTED CONCENTRATIONS** of NO₂ concentrations as follows:

Receptor name	2012 Base	2015 Base	2015 LEZ option 1	2015 LEZ option 2	2015 LEZ option 3	2015 LEZ option 4
Anglo Terrace, London Road	64	61	60	59	60	60
Widcombe Parade*	58	40	40	39	40	40
Manvers Street	53	50	50	47	50	47
Dorchester Street	54	53	53	49	53	49
Wells Road (bottom)	46	45	45	44	45	44
Beckford Road	46	44	44	43	44	44
Bathwick Street, no. 12 (R11)	48	46	45	45	46	46
Windsor Bridge/ Lower Bristol Road	52	51	50	50	51	50

* Widcombe Parade predictions reduced as a result of Rossiter Road/Widcombe scheme

- PM10 also modelled – already below national objective limit and similar results

Conclusions:

- The expected changes in concentrations of NO₂ are relatively negligible
- The future year and LEZ scenarios were significantly better for PM emissions as newer vehicles have better particle filters, but road traffic exhaust emissions typically make only a small contribution to total concentrations of PM10, which is dominated by background concentrations
- The largest local changes in concentrations occur between the base-line 2012 and base-line 2015 values
- Turnover of the vehicle fleet towards newer vehicles with higher emission standards will inevitably occur over time, the benefits of the LEZ will diminish accordingly (unless the Euro standard of the LEZ is raised in the future)
- The costs incurred by HGV operators in retro-fitting or replacing vehicles to comply with a Euro 5 LEZ restriction on Bathwick Street/London could be considerable – circa £10m
- The cost effect on bus operators in Bath could also be high, particularly with an LEZ targeting the central area which will inevitably affect most if not all services. The current bus fleet has only about 12% of vehicles which are Euro 5, so most buses would need to be retro-fitted or replaced to achieve compliance. The overall cost is estimated to be circa £1.65M
- The Option 4 annual emissions reductions are comparable with Option 2 but, unlike the latter, are not reliant on introducing a restriction on HGVs using the Primary Road Network (PRN). Any such effect on the PRN is likely to be contested by both Wiltshire Council and

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the Highways Agency, as both objected to the 18 tonne weight restriction on turns between Bathwick Street and Beckford Road. Whilst the modelling has assumed 'no diversion', and thus full compliance with any restrictions affecting Bathwick Street/London Road, there may be some re-routing of HGVs but numbers likely to do so are difficult to quantify without detailed knowledge of typical origin-destination patterns

Key Learnings:

- Little merit in pursuing options 1 or 2 (would be construed as having the same effect on the Primary Route Network as the 18t weight limit – objections from the Highways Agency and Wiltshire County Council)
- An LEZ in the central area (option 4) removes the PRN issue and is compatible with the Norwich and Oxford approaches where there was regulation of the bus route through a traffic regulation condition
- Central area restrictions could be extended to HGVs using central area for servicing/access – no option for diverting to other authorities. This option would also be supported by the Freight Transhipment Scheme using an electric vehicle
- Options 1, 2 or 3 will not necessarily remove any HGVs from London Road by encouraging use of alternative routes. The benefit assessed in this work is only that potentially achieved by attaining Euro 5 standard for the circa 70% of HGVs currently non-compliant now as opposed to an overall reduction in numbers as well due to diversion
- Emissions model assumes and predicts that concentrations may reduce anyway with turnover of the vehicle fleet

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