TRANSFORMING THE BUS FLEET TO TACKLE POLLUTION IN LONDON

Elliot Treharne
Air Quality Manager
November 2016
TODAY
AIR QUALITY IN LONDON

"Oxford Street pollution levels breached EU annual limit just four days into 2015"

NICHOLAS CECIL | Tuesday 6 January 2015
AIR QUALITY IN LONDON

Putney High Street breaches annual diesel pollution limit eight days in to 2016

JONATHAN PRYNN | 4 hours ago | 12 comments
NO$_2$ – A EUROPE WIDE CHALLENGE
HEALTH AND EQUALITIES

Health
• We estimate an equivalent of up to around 9,400 deaths were caused by long-term exposure to air pollution.
• A baby born in 2010 and exposed to that same level of air quality for its entire life would lose 2.2 years (if male) and 2 years (if female) of life expectancy.

Fairness
• The health impacts associated with air pollution fall disproportionately on our most vulnerable communities, affecting the poorest and those from minority ethnic groups more acutely.
• Tackling air pollution is about social justice and there is an urgent need to do more to tackle public health inequalities.
NO$_2$ CHALLENGE IN 2013

Legal limit

NO2 Annual Mean (ug/m3)
- 97
- 76
- 73
- 58
- 55
- 43
- 40
- 37
- 34
- 31
- 28
- 25
- 22
- 19
- 16
- 13

← Legal limit
NO$_2$ CHALLENGE IN 2025

NO$_2$ Annual Mean (ug/m$^3$)

- 97
- 76
- 73
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← Legal limit
NOx EMISSIONS IN 2013

Road transport 50%

- Diesel Car 12%
- Petrol Car 6%
- HGV 11%
- TfL Bus 10%
- Non-TfL Bus and Coach 3%
- Taxi 2%
- Motorcycle <1%

- Van and Minibus 6%

Non Road Mobile Machinery 7%
- Industry 7%
- Gas - Non-Domestic 8%
- Gas - Domestic 12%
- Domestic and Commercial other Fuels 3%
- Other 1%
- River 1%
- Rail 3%

Resuspension <1%
NEW MAYORAL PRIORITY

- The Mayor held a consultation on a number of measures within weeks of coming into office.

- Over 15,000 people responded and we recently started a second consultation with more detailed information.

“...we need big, bold and sometimes difficult policies if London is to match the scale of the challenge.”

www.london.gov.uk/cleanair
EMISSIONS SURCHARGE

- We will be consulting on an emissions surcharge (T-charge) on older polluting vehicles entering central London from 2017.
  - A £10 charge during Congestion Charge hours
  - On top of the existing £11.50 congestion charge
  - For pre-Euro 4/VI vehicles (generally those registered up to and including 2005)

- In July, there was strong support from the public – 81% of Talk London respondents and 62% of TNS respondents support.
ULTRA LOW EMISSION ZONE

Exempt but new licensing requirements

Euro 4 petrol (<13-14yrs old in 2020)
...or £12.50 a day

Euro 6 diesel (<4-5yrs old in 2020)
...or £12.50 a day

Euro VI (<6yrs old in 2020)
...or £100 a day
NEW ULEZ PROPOSALS

Central London ULEZ in 2019 (all vehicles)
- £12.50 per day
- £100 per day

Londonwide ULEZ, as early as 2019, but possibly later (heavy vehicles)
- Up to £100 per day

Inner London ULEZ, as early 2019, but possibly later (all vehicles)
- Up to £100 per day
- Up to £12.50 per day

Emission standards
- Petrol: Euro 4
- Diesel: Euro 6
- Motorcycle and L-Cat: Euro 3
ULTRA LOW EMISSION ZONE (ULEZ)

Central London ULEZ

• Hybrid and Euro VI requirement for TfL double deck buses introduced by September 2019 (instead of September 2020)

• Single deck buses to meet a minimum Euro VI standard by 2019 and all zero emission at tailpipe by 2020.

Londonwide ULEZ

• We are working to deliver a Euro VI standard for any enlarged ULEZ – i.e. not necessarily hybrid or zero emission
ELECTRIC BUSES

Single Deck

• 17 pure electric buses in the fleet
• Routes 507/521 - 51 ADL/BYD electric buses expected to be fully operational in December 2016 taking fleet to 66. Buses are preforming well so far.
• Next route converted to electric in late 2017
• Continuing to monitor energy consumption and charging
Double Deck

- Five pure electric double decks on trial on route 98
- Good performance when in service and positive feedback from drivers and customers
- Continuing to monitor energy consumption and charging
TECHNOLOGY TRIALS – INDUCTIVE CHARGING

Wireless Charging Bus Trials

• Electric range extended ADL hybrid buses
• Funded as part of ZeEUS European programme
• 3 in use on route 69, Walthamstow – Canning Town
• Specially designed buses to wirelessly charge their batteries while they wait at bus stands
• Trial objective to achieve running 80% of the time in EV mode
TECHNOLOGY TRIALS – CONDUCTIVE CHARGING

“On Street” Pantograph charging

• Range extended Volvo hybrid buses

• Objective: to trial pantograph conductive roadside charging solution(s) in real world London bus operating environment – up to four double deck buses will be used in this technology trial

• The focus of the trial is to gain operational experience using this type of opportunistic charging to top up battery, and understand how scalable this type of solution is.

• This could be extended to pure electric buses, enabling smaller batteries to be used.

• Operator chosen, finalising route selection

• Aim to introduce in mid 2017
TECHNOLOGY TRIALS – HYDROGEN

Current Bus Fleet:

• RV1: Eight buses gradually in service since 2011 as part of the Clean Hydrogen in European Cities (CHIC) project

• Over 1 million kilometres travelled and over 130 thousand fuel cell running hours to date

• Maintenance and refuelling facility constructed within a standard bus depot (Lea Interchange)

• Tower Transit undertaking all maintenance with support from Ballard and Wrightbus

• Two new VanHool 12m buses ordered for delivery in 2017 as part of the project 3Emotion

MAYOR OF LONDON
Next stage trial:

- Funding secured to increase fleet by at least 20 buses in London.

Hydrogen double deck:

- A prototype developed by Wrightbus being unveiled today, to be demonstrated in London in 2017.
CONCLUSION

• Mayor has set out commitment to transform London’s bus fleet

• Phasing out diesel and only procuring hybrid/hydrogen/electric double decks from 2018

• Long term commitment to have a zero emission fleet

• Other cities share the same challenges as London.

• Manufacturers now need to respond to the expectations re: zero emissions being set by cities
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