



**RHA NOx Emission Assessment
April 2019**

Road Haulage Association

26 April 2019

V.4

Policy context

1. The DEFRA Clean Air Zone Framework (2017)¹ requires local authorities to improve air quality in their areas. The Road Haulage Association (RHA) supports the UK government's aims to improve local air quality but disagrees with the approaches promoted by DEFRA and the Department for Transport (DfT). The focus to date has been in the creation of 'Clean Air Zones' with an emphasis on introducing high charges for pre-Euro VI lorries.
2. The RHA and others have highlighted that the problems this approach is causing in the road haulage sector and the ineffectiveness of current approach to focus solely on certain vehicle types (e.g. HGVs and buses) while ignoring other factors and other vehicle types.
3. Over the last two years the RHA assessed how NO_x emissions from HGVs have changed and will change to 2025. This paper provides our estimation of the changes to NO_x emissions between 2013 and 2025 based on the expected composition and use of the HGV fleet in Great Britain. The assessment is based on actual lorry fleet numbers up to the end of 2018 published by the DfT on the 11 April 2019², with estimates the fleet change by Euro class over time from 2019 to 2025.
4. The data shows that the HGV sector has already reduced NO_x emissions by just over 50% since 2013 without Clean Air Zones being imposed or disruption to the vehicle replacement cycle. If no further action was taken at all, that reduction would be over 80% by 2025.
5. This set of estimates is vital given that the sector has no option to avoid Clean Air Zone charges other than the replacement of all non-Euro VI lorries. There is no retrofit option available for lorries – nor any effective government support to provide lorry retrofit. The only options for operators are to replace vehicles prematurely, refuse to enter cities imposing CAZ fines, or to pay the fines levied by local authorities.
6. The RHA believes that CAZ policies should work with the normal vehicle replacement cycles and should not undermine business investment in vehicles (as is the case now). The focus should be on vehicles over 12 years old. Failure to do this is resulting in an excessive and unnecessary cost to businesses and consumers.

¹ DEFRA (2017). Clean Air Zone Framework. DEFRA, London, UK.

² DfT table VEH0511 - <https://www.gov.uk/government/statistical-data-sets/veh05-licensed-heavy-goods-vehicles>

RHA NOx emissions assessment - 2019

The RHA’s estimates for NOx emissions from the lorry fleet between 2013 and 2025 in Great Britain is presented in Figure 1. For indexing, we considered 2013 as a base year as this is the year Transport for London (TfL) use as their baseline for the London Ultra Low Emission Zones. We can see that following the introduction of Euro VI in 2014, NOx emissions fell by 52% to 48% of the 2013 baseline by the end of 2018. The 21% reduction in the RHA assessment between 2013 and 2015 is in line with the NAEI assessment as shown in Figure 3 below.

In summary, by 2025, NOx emissions from the lorry fleet is expected to be reduced to less than one-fifth of the base year emission level (i.e. the end of 2013).

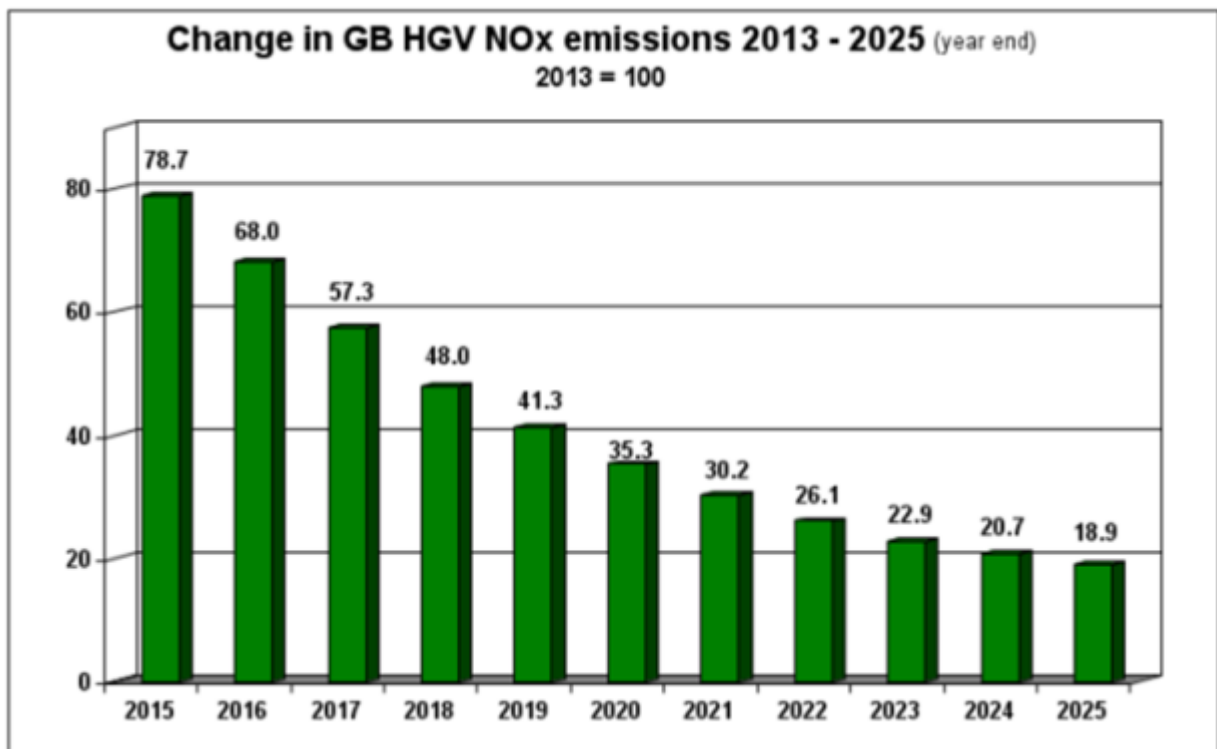


Figure 1: RHA Estimates of NOx emissions from lorries in Great Britain.
NOx Index 2013 = 100.

Fleet age profile by Euro class

Understanding how the lorry fleet changes over time is vital for policymakers so that they can assess the impact of any proposed Clean Air Zones on businesses.

It is not just operators who will be impacted by the proposed Clean Air Zones - businesses that service the haulage industry such as garages, parts suppliers and Roadworthiness Testing businesses stand to be dramatically impacted in the early application of CAZ areas on all non-Euro VI lorries.

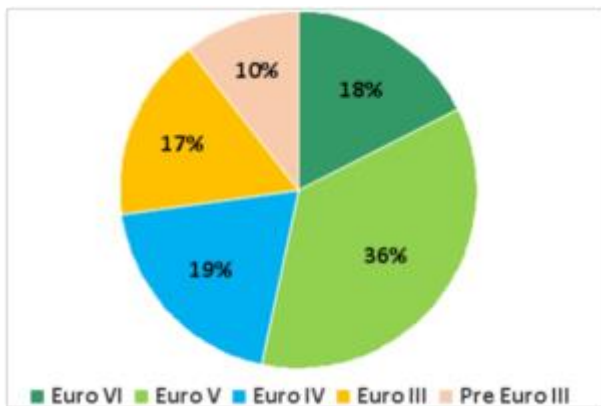


Figure 1a: GB HGV fleet by Euro class end 2015.

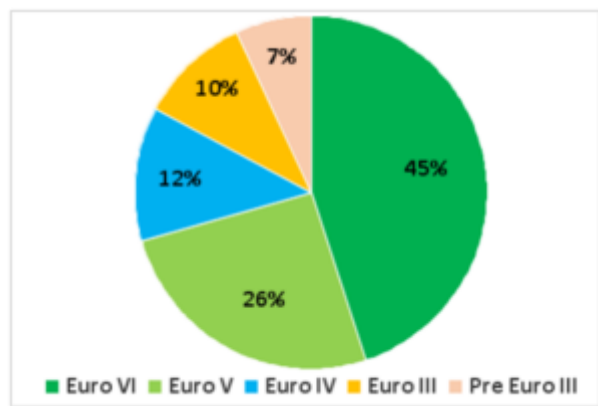
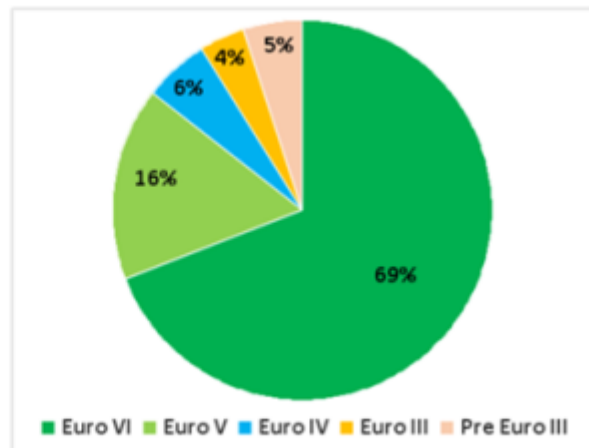
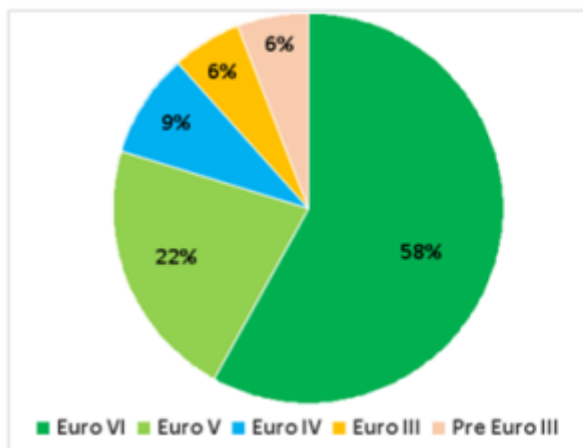


Figure 2b: GB HGV fleet by Euro class end 2018.

Figure 2c: GB HGV fleet by Euro class end 2020.

Figure 2d: GB HGV fleet by Euro class end 2022.



The above charts show how the composition of the GB lorry fleet evolves over time.

The assessment shows that at the end of 2020 over 40% of the lorry fleet will not be Euro VI – and will, therefore, be subject to Clean Air Zone “pay to pollute” charges where they apply from 2021.

The assessment (see Annex Table A2) shows that, even without Clean Air Zones, by 2025 the lorry fleet will be dominated by Euro VI – with about 80% fleet being Euro VI at that time. That 80% will represent nearly all commercially active vehicles at that time.

NOx emissions by source

Data published by the National Atmospheric Emissions Inventory (NAEI)³ show that NOx emissions from lorries and buses (i.e. heavy-duty vehicles⁴) is declining and accounted for a small proportion (7.6%) of the total NOx emissions in 2015 (Please see Figure 1b). In contrast, between 2013 and 2015, the proportion of NOx emissions from other transport and passenger cars has increased from 20% to 23% and 14.5% to 16% respectively (Please see Figure 3a and 3b).

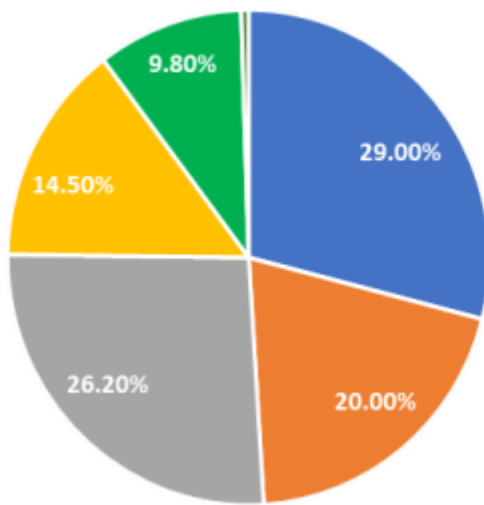


Figure 3a: NOx emissions by key sources in 2013 in the UK.

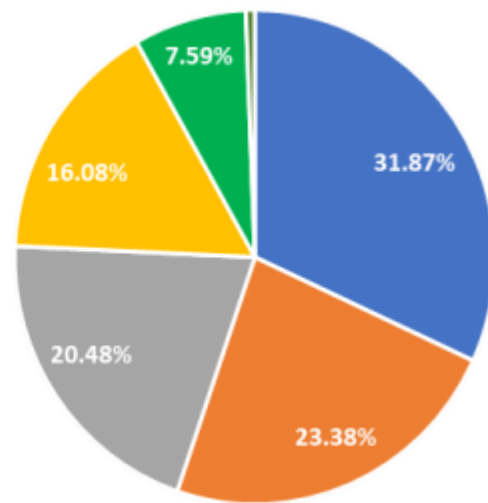


Figure 3b: NOx emissions by key sources in 2015 in the UK.

- Combustion in Industry
- Other transport
- Public electricity & heat production
- Passenger cars
- Lorries and buses
- Production processes: Agriculture/waste/other

³ NAEI - http://naei.beis.gov.uk/overview/pollutants?pollutant_id=6

⁴ Heavy-duty vehicle – A bus or lorry designed for heavy work. https://en.wiktionary.org/wiki/heavy-duty_vehicle.

Concluding remarks

The 2019 estimates build on the estimates done by the RHA in previous years. The consistent outputs between the 2018 and 2019 run give us a high degree of confidence in the data produced.

Our estimates continue to show that pre-Euro VI vehicles are rapidly being replaced by Euro VI and this trend will continue.

Our data also gives an indication of for how long modern Euro IV and Euro V lorries will be in active service. Generally, lorries last about 12 years in active service, we know that it is longer for specialised vehicles.

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The RHA predictions are clear. That given the changes in fleet profile consistent with the long-term replacement rates for lorries, by 2025 there will be an 80% decline in NO_x emissions level from the GB lorry fleet compared to the 2013 base year level - without imposing any restrictive measures on HGV movements. This reduction excludes any change due to alternative fuels or electrification – both of which may add to that reduction.

If the focus of the clean air zones was limited to the older proportion of the fleet – those lorries over 12 years old, much of the benefits would be obtained, but without the increasingly apparent serious commercial impacts on businesses – mostly SME businesses.

Duncan Buchanan,
Policy Director – England and Wales
Email: d.buchanan@rha.uk.net

26 April 2019

Annex - RHA Information on the GB lorry fleet and emissions

Table A1 below shows EU NOx emission standards for HGVs over time:

Table A1: NOx emissions - maximum permitted by Euro Standard

Euro standards	Year	NOx standard*
Euro VI	2014 onwards	0.4
Euro V	2009 to 2013	2.0
Euro VI	2006 to 2008	3.5
Euro III	2001 to 2005	5.0
Pre Euro III	1997 and older	7.5

(Rounded to full year)

Table A2 below shows the approximate Euro Standard for the GB lorry fleet in each selected year. Up to 2017, DfT data is used, RHA estimates are used thereafter.

Table A2: Licensed heavy goods vehicles at the end of the year in Great Britain between 2015 and 2025.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Euro VI	17.6%	28.0%	36.3%	44.9%	51.8%	58.0%	63.9%	69.2%	73.8%	77.9%	81.2%
Euro V	35.6%	32.1%	29.2%	25.7%	24.0%	21.7%	19.0%	16.4%	13.9%	11.6%	9.7%
Euro IV	19.4%	16.8%	14.5%	12.2%	10.6%	8.6%	7.0%	5.6%	4.5%	3.6%	2.9%
Euro III	16.9%	14.2%	12.2%	10.4%	7.3%	5.9%	4.8%	3.9%	3.4%	2.9%	2.4%
Pre Euro III*	10.5%	8.9%	7.9%	6.8%	6.3%	5.7%	5.3%	4.9%	4.4%	4.0%	3.7%

Data to 2018 extracted from DfT Statistics - VEH0511, published April 2019.

* RHA Data generated from long-term fleet profile information derived from VEH0511 - April 2019.

Figure A3 below shows NOx emissions by source – this data was published by the UK’s National Atmospheric Emissions Inventory.

Figure A3: NOx emissions from key sources between 2010 and 2015.
Data source: National Atmospheric Emissions Inventory (NAEI).

