Response by The Chartered Institute of Logistics and Transport to the draft Air Quality Plan *Tackling Nitrogen Dioxide in our towns and cities: A Consultation*

The Chartered Institute of Logistics and Transport is a professional institution embracing all transport modes whose members are engaged in the provision of transport services for both passengers and freight, the management of logistics and the supply chain, transport planning, government and administration. Our principal concern is that transport policies and procedures should be effective and efficient, based on objective analysis of the issues and practical experience, and that good practice should be widely disseminated and adopted. The Institute has a number of specialist forums, a nationwide structure of locally based groups and a Public Policies Committee which considers the broad canvass of transport policy. This submission draws on contributions from all these sources.

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Executive Summary

- The published draft Air Quality Plan shows a timidity by central government in 'owning' the overall air quality issue: too much of the responsibility for action on the ground and for developing and evaluating new packages of measures and assuring their effectiveness is placed on local authorities. Government needs to provide stronger guidance and facilitate the sharing of lessons learned and best practice between the 40-odd local authorities most of whom may have to implement Clean Air Zones (CAZs). Government needs to provide more political cover in the likely (in our view) event that charging or exclusion-only zones will be required to achieve the stated objectives.
- The Draft Air Quality Plan treats the introduction of 'charging CAZs' as the last resort when all other non-charging measures can be shown not to be effective. This is unhelpful and disingenuous, given that the government's own comprehensive Technical Report clearly states that non-charging methods will not achieve compliance with statutory limits on roadside NO_2 concentrations within the required timescale, except where exceedances are small; and that only charging will achieve this objective.
- Government needs to investigate and be prepared to consider – as an alternative to charging CAZs - exclusion-only non-charging CAZs: these are common across Europe with some 200 towns and cities in 13 countries using various versions of them. They may be more acceptable, can be implemented quickly at much lower cost and in less time; their minimum emissions standards can be progressively tightened.
- The overall strategy should recognise that buses in particular are an essential part of the solution – providing acceptable alternatives to the private car for journeys and with current Euro standards providing much better emissions performance per passenger-km than cars. Buses should continue to be prioritised for retrofitting to achieve Euro VI standards, and incentivised under the Low Emission Bus scheme for replacement with ultra-low-emission technologies (hybrids, EVs and other technologies) or with Euro VI engines.
- We are suggesting government should establish a CAZ Advisory Panel, bringing a small number of experienced individuals from local authorities, DfT and its relevant agencies, the ITS community and other bodies together to provide guidance, lessons learned and advice to local authorities faced with designing, developing, evaluating and implementing CAZs and related measures.
- We recognise there are particular concerns about air quality on certain motorways and main roads providing access to London Heathrow Airport. We recommend serious consideration be given, as part of the planning and development consent process for the third runway, to the idea of Heathrow Airport being designated an Ultra Low Emission Zone (ULEZ). This should be alongside and with the same conditions and charging arrangements as the extension in 2020 or 2021 of the London ULEZ to the area inside the North and South Circular Roads, which is being considered by the London Mayor and likely to be the subject of statutory consultation later in 2017.

Introduction

1. CILT welcomes the opportunity to comment on the government's latest Draft Air Quality Plan. As the draft plan states, the levels of roadside air pollution on certain roads in many towns and cities across UK, and along a growing number of heavily used strategic roads, exceed the acceptable limits set out in UK legislation and are known to be injurious to health. The elements of roadside air pollution that are of most concern are Nitrogen Dioxide

(NO_2), which is produced by the combustion of fuel oils, particularly in diesel engines, and fine particulate matter PM_{10} and $PM_{2.5}$ produced by diesel engines, tyre wear and road surface wear. Some 80% of the pollution is caused by road transport vehicles, the overwhelming majority from traffic local to the points of measurement.

2. Within the last 18 months the government has experienced rejections by the Supreme Court of two previous Air Quality plans, on the grounds that they were inadequate to reduce pollution sufficient to meet the requirements of the Air Quality Standards Regulations 2010. This is the third plan, focussing on reducing NO_2 concentrations in towns and cities, on which consultation is now taking place. Government owes it to the millions of pedestrians and road users in the UK affected by poor air quality, as well as to its own reputation, to ensure that this latest plan is **targeted, deliverable** within a very few years, **effective** in reducing roadside concentrations of NO_2 below the statutory limits and **affordable/value for money**. CILT's response pays particular attention to these four requirements. The following general observations and comments are reflected in our responses to the specific consultation questions which follow.

The government's approach

3. The draft plan states that, based on a combination of observation and modelling, there are roads within 40 local authorities (including Greater London) which now experience significant exceedances of NO_2 concentrations - either the statutory maximum annual average concentration (40µg/m^3) or the statutory maximum number of hours in a year (18) where concentration exceeds 200µg/m^3, or both[1]. The overall extent of NO_2 exceedances is now much greater than the six urban areas in the previous plan, and is attributed to recognising the widespread non-compliance of many makes of cars and vans with recent Euro standard engines, where real world emissions of NO_2 are much higher than those specified in the standards. By contrast the compliance levels in real-world conditions for Euro VI engines in buses, coaches and HGVs are good[2].

4. The government's approach is to pass to local authorities the responsibility for preparing and putting into place appropriate measures to secure a reduction in roadside NO_2 concentrations. Of course every area needs to determine its own package of measures and to be accountable for their impacts and effectiveness. But the published Air Quality Plan shows a timidity by central government in 'owning' the overall air quality issue and the actions necessary to address it, and seems to be taking something of a hands-off approach. Too much of the responsibility for action on the ground, and for developing and evaluating new packages of measures and assuring their effectivenessis is placed on local authorities. This hands-off approach expects local authorities to start from scratch to work out the deliverability and effectiveness of different measures with apparently little guidance from central government, not giving enough weight to measures that will need national coordination, for example to ensure interoperability between towns, and without the political cover for exploring policies that may not initially be popular locally. Government needs to provide more substantial guidance

[1] Air Quality Standards Regulations, 2010

[2] *Comparison of real-world off-cycle NO_x emissions control in Euro IV, V and VI,* the International Council on Clean Transportation, March 2015. http://www.theicct.org/sites/default/files/publications/ICCT_Briefing_EuroIV-V-VI-NOx_Mar2015.pdf Retrieved 8 June 2017.

and coordinate the sharing of lessons learned and best practice for the 40 or so local authorities who may have to implement CAZs. There should be a shared effort to maximise the use of current knowledge and experience, and available resources.

5. Unlike carbon emissions and their effects on global warming, which are worldwide in their nature and consequences, air pollution and health risks caused by excessive concentrations of nitrogen dioxide and particulate matter are essentially local. The consultation document notes that action to reduce NO_2 **needs to be targeted to problem areas, which are specific roads located mostly in cities and towns[3],** and needs **to be targeted on the sources that make the biggest contribution to the problem[4],** that is, diesel powered vehicles, discriminating as appropriate between their ages and compliance with different Euro engine standards, and between different vehicles types**.** We agree with this focus on geography and on source by type, and it informs the CILT response.

6. The consultation document proposes a number of parallel measures, some of which apply to cars (and vans) and some to heavy-duty vehicles (trucks and/or buses) and some to all vehicles[5].

    1) Retrofitting "exhaust cleaning" technology to older, higher-emission diesel engines to reduce their toxic emissions
    2) Public sector replacement of polluting vehicles – buses, cars and vans - by procuring ULEVs (Ultra Low Emission Vehicles), and encouraging private transport operators to do the same
    3) Reduction in car use through encouraging travel behaviour change
    4) Reduce emissions by improving road layouts and junctions to optimise traffic flow, using the relationship between emissions and the variability and levels of road speed (and engine rpm)
    5) Charging certain types of vehicle to enter or move within a Clear Air Zone (CAZ)

    And the need is noted to work with local businesses and neighbouring authorities to ensure a consistent approach.

Prospects for improvement

7. These various measures hold very differing prospects for successful mitigation of toxic emissions and improvements in air quality. Their success depends on how well each meets the requirements to be targeted, deliverable, effective and affordable/value for money:

[3] Para 16, *Tackling nitrogen dioxide in our towns and cities: A Consultation,* Defra and DfT, May 2017
[4] Para 17, *ibid*
[5] Para 24, *Ibid*

a. Measures may be poorly targeted at the more polluting vehicles – for example, measures to encourage travel behaviour change through sustainable travel initiatives. Often worthwhile in their own right they apply to all car users; they are unlikely to be effective in significantly reducing the proportion of more polluting vehicles, especially without any incentive.

b. Measures may not be deliverable in the scale required - such as encouraging take-up of battery-powered ULEV cars through continuation of the existing grant scheme. Market penetration (1% of all new registrations) is still small and immature, and dominated by 'early-adopters'. In any case, continuing the grants on the scale required may not be affordable or value for money.

c. Measures for reducing emissions by optimising traffic flow, reducing congestion and idling vehicles can be well targeted, and individually may be deliverable and effective[6]; but while some localised emissions hotspots can be mitigated, this approach is not readily scalable and unlikely to be a solution for a whole network.

d. In trucks and buses, retrofitting equipment to reduce NO_s and particulate emissions to existing engines meeting earlier standards, or replacing older engines with modern Euro VI engines, is well targeted and the results suggest can be effective. Is the industry capability available to carry this out at the required scale? And is there sufficient incentive for operators outside London's regulated bus network to pay for it? Since buses are part of the solution as well as part of the problem, we return later to how this approach can be delivered successfully for buses.

8. At the heart of the plan is the adoption of Clean Air Zones (CAZs), with or without some form of charging of non-compliant vehicles. As part of the process of preparing the previous, second Air Quality Plan, the government consulted on a Clean Air Zone Framework [7] and published the definitive CAZ Framework at the same time as the draft (third) Air Quality plan. Where no charges for access are applied, the CAZs provide a focus for a wide range of measures – such as those mentioned above and some in the CAZ Framework. But there is no enforcement mechanism to mandate the adoption of any of these measures within a CAZ[8]. So even where the CAZ is well targeted, and deliverable, we doubt whether it will ever be effective without enforcement.

9. Charging in CAZs. The government's approach is to contemplate a charging proposal from a local authority only if – one by one - they can demonstrate that non-charging measures would not be effective. We think this is a disingenuous and time consuming step, particularly as the government's own Technical Report accompanying the draft Air Quality Plan itself says that charging would be necessary in most cases to achieve compliance within a few years. The report, having reviewed the wide range of options and measures in Table 10.3 on pp187-188, goes on to say on p189[9]: "*All options, except*

[6] For example the Newcastle Compass 4D scheme

[7] *Clean Air Zone Framework*, Defra and DfT, May 2017

[8] The framework acknowledges that for buses, taxis and private hire vehicles licensing, franchising and partnership powers may be used for enforcing adoption of more recent Euro engine standards

[9] *Draft UK Air Quality Plan for tackling nitrogen dioxide: Technical Report,* Defra and DfT, May 2017

charging CAZs, are shown to be similar to the baseline projection, bringing forward compliance in only a small number of zones where the exceedance is small. It is clear that charging CAZs have the greatest impact by bringing the majority of zones into compliance by 2021".

10. Acceptability of the charging CAZ could be enhanced by introducing it first with less demanding emissions standards than Euro VI, and then progressively raising those standards. The approach being taken in London reflects this phased approach: first, all types of vehicle with less than Euro 4 (cars and small vans) and Euro IV for buses, coaches and HGVs) will from October 2017 be charged within the Central London Congestion Charge Area (CCA) and with the same timings. Next, probably from April 2019, a ULEZ will be introduced for the central London CCA with Euro 6 and Euro VI minima for diesel vehicles, operating 24/7, and non-compliant vehicles will be charged. At a later stage, probably 2020 or 2021, the plan is for the ULEZ for cars and vans to be extended to the area bounded by the North and South Circular Roads, and the ULEZ for buses, coaches and HGVs extended to the whole Greater London area. The evidence of health impacts on which the Mayor is justifying his plans[10] will have some relevance in other large conurbations and cities and help support the need for action.
11. The charging CAZ principles set out in the Consultation Document and in the CAZ Framework documents are too inflexible – it should be possible for a local authority to decide to introduce a less demanding emissions standard initially, and to progressively tighten it over a few years.
12. While the CAZ Framework provides some guidance for local authorities, there is a need for some way of providing practical advice to up to 40 local authorities who may need to progress a CAZ and who mostly have very little experience of this – and are strapped for resources. To avoid 're-inventing the wheel' several times over, and to enable the lessons of the last 15 years to be brought to bear, we propose that DfT should create a CAZ Advisory Panel, bringing a small number of experienced individuals together from local authorities (including TfL), DfT and its relevant agencies, the ITS community, traffic management and independent experts. The aim is to provide guidance and share lessons learned and best practice (including from Europe), to offer advice to local authorities faced with designing, developing, evaluating and implementing CAZs and related measures.

A non-charging, exclusion approach for CAZs

13. We are surprised that there is no mention in the consultation documents of a different approach to CAZs which is to be found throughout Europe, in over 200 towns and cities in 13 countries – the non-charging exclusion zone. A CAZ – or LEZ as they are usually called - simply excludes vehicles with old emission standards, subject to a fine for non-compliant vehicles. The idea is to have a gentle start based on excluding 15 or 20 year old vehicles, and progressively over a few years raising the emissions standards to exclude the more polluting vehicles.

[10] *Understanding the Health Impacts of Air Pollution in London*. Walton, H., Dajnak, D., Beevers, S., Williams, M., Watkiss, P. & Hunt, A, King's College London, 2015. Retrieved 20 March 2017 from www.kcl.ac.uk/lsm/research/divisions/aes/research/ERG/research-projects/HIAinLondonKingsReport14072015final.pdf

14. Both the minimum Euro emission standards and the classes of vehicles to which they apply vary between countries and cities[11]. Most at this stage require emission standards Euro 1, 2 or 3 diesel, applying to all vehicles, or vehicles with 4+ wheels, or trucks and buses or just trucks. Nearly all locations plan progressively to raise the minimum Euro engine standards to Euro 4, 5 or 6 over the next 3-5 years. LEZ enforcement is at this time mostly manual, many based on a paper windscreen sticker – in France, vehicles entering Paris, Lyons and Grenoble require a 'Crit' Air' colour-coded nationally valid windscreen certificate obtainable on line for €4.60. At the moment only vehicles registered before 1 January 1997 (Euro 2) are excluded under the French scheme, but the minimum standard will be raised annually over the next three years. Enforcement in Belgian and Dutch LEZs, and in Milan, is by ANPR, as are of course the current and future LEZs in London.

15. We do not know how effective the European LEZs are, based on exclusions rather than charging, or whether the plans to raise progressively the required EU standard for LEZ access will be successfully introduced. But the idea of a CAZ without charging but with access control based on certain Euro engine standards should be among the tools available for a local authority as part of the Clean Air Zone framework; this could be with manual (windscreen sticker) or ANPR enforcement.

16. For relatively small CAZs an exclusion approach rather than charging may be a better alternative: sticker enforcement could be practical and effective, the scheme could be introduced quite quickly, it might be seen as more acceptable than charging, and it would not be necessary to invest in equipment and back office systems for digitally-based (eg ANPR) enforcement and charging. An '80-20' rule may well apply, in that the exclusion only of (for example) pre-Euro 4 diesel cars and vans (Dec 31 2005), and the equivalent for buses and trucks over 3.5T, may bring a disproportionate benefit in mitigating NO_2 emissions. It would begin to provide the incentive the other measures need in order to have some impact overall.

17. In the medium term, an exclusion-based CAZ could become a charging CAZ: charges could be introduced progressively for Euro standard engines below the latest Euro 6 and Euro VI, as an alternative to exclusion – perhaps for reasons of social or business impacts of exclusion. We do not believe it is necessary – nor likely to be acceptable in the short run – for the Charging CAZs to start by charging all diesel vehicles with less than Euro 6 or Euro VI emission standards: in the early stages Euro 5 or Euro 4 could be acceptable. Overriding this is the requirement of the Supreme Court that the government's plans must achieve compliance with the standards in the 'shortest time possible'. This should mean 2021 or 2022 at the latest.

18. The urgency of action is recognised and fully endorsed by CILT. But unless government is prepared to *require* that a charging CAZ is adopted with only the highest emission standards not charged – and to provide the political cover for it – it is surely better for a local authority to adopt either an exclusion-only non-charging zone or, as a starting point, less demanding emission standards for a charging zone, than to rely only on 'encouragement' with no powers of enforcement as suggested in the consultation document.

[11] See www.urbanaccessregulations.eu/overview-of-lezs

Buses and Coaches

19. The Technical Report (Fig 1.2) notes that buses and coaches account for some 15% of roadside concentrations of NO_2 contributed by local traffic. There is a tendency, seen elsewhere as well as in the draft Air Quality Plan, to 'demonise' buses as one of the first vehicle classes to be excluded, charged, subject to mandatory retrofitting of improved engines. Is this justified by the relative emissions levels, and taking account of the relative load factors of buses and cars? The Consultation Document[12] has a graph which suggests that - averaging across the present fleet mixes - buses emit about 10 times the NO_x of a diesel car on a vehicle-mile basis. On an all-week basis, with car occupancy at 1.61 and bus occupancy nationally at 12.2[13], the emissions *per passenger-km* work out at some 25% lower in the car; in peak periods with higher bus occupancy and lower car occupancy the advantage would pass to the bus. However, although the data allows occupancy to be examined by smaller time intervals for cars the data for PSVs, and HGVs are only available at the all-week level. Wherever possible emissions should be compared on a *per passenger-km* basis.

20. But the relevant comparison is not with average fleet mixes. Buses with Euro VI engines at urban average speeds emit 0.93g/km of NO_x while cars with Euro 6 diesel emit 0.34 g/km[14] (and real-world car emissions remain worse than this); so the bus emissions are less than three times those of the car even when the latter is in full compliance. When average occupancy is factored in, a modern bus emits one-third of the NO_x of a modern car per passenger-km. With peak hour occupancies the comparison is more favourable to buses. A recent report by Professor David Begg[15] published by *Greener Journeys,* which presents evidence that Euro VI buses with effective priority measures can deliver 75% less emissions than cars.

21. While measures to make buses more attractive have generally had modest impacts on transfer of trips from car to bus when carried out in isolation, improvements in bus services, including information and ease of ticketing and use, are certainly an essential part of a strategy that would exclude or deter through pricing the use of cars – and help to make such measures more palatable and acceptable.

22. The key point is that buses must now be treated as part of the solution. This does not mean relaxing the emissions standards for buses compared with other vehicles. But what it does mean is using all possible value for money methods to get buses – especially those serving urban areas – up to Euro VI standards (or using other low emission drive trains) within a short space of time. This means pushing hard on retrofitting suitable equipment to existing buses, bus replacement with Euro VI engines, and bus replacement with battery electric, hybrid and alternative fuel drive trains. Such a programme should be feasible and relatively affordable given that the total parc of buses is less than 1.5% of the number of diesel cars.

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[12] Ibid, p8, Fig 4

[13] *WebTAG: TAG data book, March 2017 v1.7, Table A 1.3.3,* Department for Transport, available online at https://www.gov.uk/government/publications/webtag-tag-data-book-march-2017

[14] From the COPERT factors from the NAEI, see http://naei.defra.gov.uk/data/ef-transport

[15] *Improving Air Quality in towns and cities,* Professor David Begg, Greener Journeys, London available online at http://www.greenerjourneys.com/publication/improving-air-quality-towns-cities/

23. The momentum is already there. The government has consistently supported the modernisation of the bus fleet. Recent initiatives include the Low Emission Bus scheme (LEB)[16]; initially a £30m competition run by the government's Office of Low Emission Vehicles (OLEV): a further £100m was made available in November 2016 to be allocated in the second quarter of 2017. The recent statutory requirement for disabled access to buses has already brought about fleet renewals to modern standards. Where there are publicly procured contracts for bus services – such as the regulated environment in London, and schools and social service contracts elsewhere, there should be progressively introduced requirements for or towards Euro VI standards. As the consultation documents recognises, franchising and partnership arrangements provide mechanisms for local authorities to mandate Euro VI standards.

24. There is a danger that large operators will reallocate lower standard vehicles from cities with CAZs to towns without, and risk transferring the problem. In the longer run, government and industry must recognise the need for all buses serving urban areas on regular scheduled services to meet Euro VI standards universally; it will be for government to review with the industry whether and when this can be made to come about through continuing support of the industry or whether mechanisms such as the Bus Service Operators Grant Scheme (BSOG) should be adjusted to provide a sharper incentive to achieve this objective. Such an approach is a deliverable and effective way of significantly reducing emissions from this class of vehicle and reinforces buses playing their role as part of the solution.

Taxis and Private Hire

25. The adoption of petrol-hybrid vehicles (notably the Toyota Prius) for private hire purposes is increasingly common, largely because the high annual mileage with better fuel efficiency tends to justify the higher initial cost of the vehicle. As substitutes for diesel private hire vehicles they benefit carbon emissions and noise as well as toxic emissions. We believe there may be a good case for encouraging the adoption of battery electric drives (BEVs) to replace diesel engines in 'black cabs' (hackney carriage/ply for hire licenses). There is emerging evidence that the duty cycles of the hackney carriage (stop-start in traffic; low-ish average speeds with high-ish daily mileage but evenly spread through the year) may suit the steadily improving range of BEVs, and their ability to take rapid charge during breaks. There may evolve low-emission policies specific to taxis and private hire which recognise their unique operating circumstances.

Freight Vehicles – light vans and trucks

26. Freight vehicles – vans under 3.5T (LGVs) and HGVs account together for 40% of roadside concentrations of NO2 contributed by local traffic. Unlike private car travel, where the choice of mode of travel can be influenced for many journeys, journeys by freight vehicle, whether bringing goods from A

[16] *Low Emmission Buses,* Low Carbon Vehicle Partnership, available online at http://www.lowcvp.org.uk/initiatives/leb/Home.htm

to B or supporting construction or servicing premises, cannot be substituted by other modes of travel, and the journey has to be made to support the local and regional economy.

27. Much work has been done recently to explore the scope for alternative logistical solutions, such as those involving transfers of goods to different vehicles (perhaps ULEZ or electric vehicles) for the 'last mile'. Such ideas have been developed in the current CITYLAB and FTC2050 initiatives[17]; other multimodal and transmodal programmes are seeking to redesign the entire supply chain towards a low emissions paradigm. These and other measures, such as land use policies to permit urban hubs for delivery consolidation, better rail freight connectivity, the use of telematics on all goods vehicles , and road user charging to replace VED, have been argued for in CILT's Freight Vision 2035. They have the potential to make a significant impact on freight vehicles in cities over the longer term. However, we have to recognise that such measures, many worthwhile in their own right, are unlikely to be viable at the scale necessary to make a significant impact on current NO_2 exceedances in the short term.

28. With much less available choice of alternatives for trucks and vans, compared with passenger cars, the scope for voluntary measures to mitigate truck and van emissions is more limited; in the same vein a higher proportion of freight vehicle owners are likely to choose to pay a CAZ charge than other road users, with the consequent knock on to business costs and eventually to the consumer. This is confirmed in Table 4.5 of the Technical Report[18], where modelling suggests that nearly half of light vans would pay the charge, as would more than a third of HGVs, while only 1 in 6 cars would pay.

29. Where a charging CAZ is introduced it might be helpful to limit the charge to those periods of the day – eg peak periods – when NO_2 concentrations are highest, as some flexibility in delivery times is achievable for some delivery journeys; this will mitigate the impact of a charge as well as transferring a proportion of the emissions to a less critical time in the day – providing the problem is not spread to other times of the day. However, the scope for such timing flexibility is much more limited for vans whose journeys typically encompass a wider variety of purposes and tasks, many of which are about servicing premises and not about deliveries.

30. There is also a need to recognise that LGVs and HGVs generally visit more than one local authority in the course of their daily work as illustrated by figures from TfL[19]. Under the proposed scheme many of these vehicles would need to register and incur charges in each. This has the potential to be an unacceptable cost and administrative burden. It will be helpful to consider a national or regional scheme for freight vehicles.

31. We repeat the observation made in the previous section on buses, that the experience of Euro VI engines in trucks (as well as buses) has demonstrated a high level of compliance to the emissions standards under real-world conditions, much more so than the equivalent Euro 6 compliance levels achieved with passenger cars and vans. It is important to reflect this in the way CAZ charging (and indeed CAZ exclusion) policies are developed. It is

[17] See www.citylab-project.eu www.ftc2050.com

[18] Ibid, p67

[19] There are 217,000 registered vans in London, and TfL in their Travel in London Report 8 point to just under 200,000 vans crossing the inner London cordon daily, and nearly 350,000 crossing the boundary cordon daily (TfL, 2015: 66, Figure 3.14). Some vans will cross more than one cordon in a day; others will cross none, and are hence not counted in these TfL statistics.

also useful to note that the average life of HGVs in the UK parc is significantly shorter than most of other vehicle types, largely due to the high mileage per annum of HGVs which contributes to a shorter economic life. The consequence is that a higher proportion of HGVs have the most recent Euro VI engines anyway.

32. Vans have similar emissions characteristics to cars, and like cars there needs to be a manageable incentive for them to be steadily replaced at the Euro 6 level. The scale of the van parc (3.6m in 2015) makes it difficult to justify a universal scrappage or replacement scheme but there is the possibility of a targetted scheme associated with specific CAZs, which should be explored. There is an argument for a progressive implementation of exclusion CAZs – starting at a modest level - rather than charging CAZs applying to vans as well as cars, where the pressure to replace the vehicle in a reasonable period of time is clear, without having to face an additional charge in the meantime.

Aviation

33. Aviation is relevant to roadside concentrations of NO_2 in a very particular way. Aircraft themselves make only a very small contribution to emissions which have an effect on receiving locations in the vicinity of an airport. It is the intensity of road traffic generated by the multiple activities of a major airport, on the main and access roads serving the airport, which has the potential to generate significant exceedances of roadside NO_2 concentration. This is actually the case for the major roads (especially the M4 and M25) surrounding and serving London Heathrow Airport.

34. Under the Aviation Policy Framework (2013), airports are required to work with central and local government to improve air quality, through international and local measures, and also to prepare Airport Surface Access Strategies which contribute towards reducing emissions. While airports will therefore especially benefit from any national or local measures designed to reduce emissions from diesel engines in public transport, freight and taxi fleets, in practice it will be the airport management itself, in partnership with the highway and transport authorities, that is best placed to take, lead, promote or require measures which will have an effect on toxic emissions on the main and access roads serving airports – even where those roads fall well outside the relevant airport estate.

35. The current development and consultation on the Aviation National Policy Statement, which will provide the statutory context for the decision on the third runway at Heathrow, requires that the surface access strategy by Heathrow Airport Ltd (HAL) should enable the required mode targets to be achieved – with an overriding objective of no net increase in airport related traffic. CILT's response to the draft NPS suggests that this objective should be a condition of the Development Planning Consent. Heathrow has a long record of policies, measures and investment to contain and reduce car use to and from the airport, both by those working at the airport and by air passengers and their meters and greeters, and their experience can and should be used to achieve this as well, using new tools such as charging for access.

36. However, to mitigate the current and forecast air pollution levels on main roads serving the airport, the 'no net increase in airport related traffic' policy must be associated with specific measures to address the emission levels of older diesel vehicles. This could take the form of a progressive exclusion from the Heathrow estate of older diesel vehicles not meeting specific Euro engine standards – initially Euro 4 diesel cars, vans and taxis, leading to Euro 6; and Euro IV leading to Euro VI buses and HGVs.

37. A more practical and acceptable alternative might be to designate a Heathrow Airport ULEZ at the same date (2020 or 2021) as the London Mayor will later this year be proposing to extend the London ULEZ to the area within the North and South Circular roads, applying to all vehicles. This would require all diesel vehicles to be Euro 6 or Euro VI. In practical terms, special legislation might be necessary for the Secretary of State, in collaboration with the London Mayor, to designate a ULEZ for Heathrow Airport, possibly in association with the Development Consent Order for the third runway. If the terms, conditions, charges and payment arrangements were the same for Heathrow Airport as for the inner London ULEZ, it could be made completely seamless for the road user. In this way it could be effective in substantially reducing entry to the airport of non-compliant vehicles: this would directly affect a proportion of traffic on the surrounding motorways (M4, M25) as well as on the airport access and local roads such as the A4. .

Rail

38. Diesel engines on locomotives and on multiple units are subject to the similar principle of the progressive tightening of emissions standards as for road vehicles. While there are issues of excessive NO_2 concentrations in a few enclosed stations, potentially affecting staff more than passengers due to the periods of exposure (such as at Birmingham New Street), rail emissions have no impact on roadside concentrations. Their scale is also proportionately much less significant per passenger –km or per freight tonne-km, in comparison with road diesel vehicles.

39. Rail is, however, potentially part of the solution in those towns and cities with excessive roadside concentrations where rail commuter networks can draw significant percentage of peak period travel; the same applies where extensive light rail or tram networks are present, as in Manchester and of course London. While air quality benefits will never provide the dominant case for rail investment, it is important to take them fully into account when considering and evaluating developments in heavy or light rail. As well as tackling diesel emissions at the city centre locations where they have the worst impact, a wider role for electrically powered transport, both freight and passenger, should be actively considered. The consultation document makes fleeting references to public transport (24d) and bus and rail improvement measures (31) but looking at transport and logistics more holistically could help make a major contribution. The Institute considers that electric rail should be promoted as a more environmentally clean solution to improve freight deliveries in major cities. The use of sites along main rail corridors on the approaches to cities to effect modal transfer into electric vehicles, both road and rail, has been considered and implemented in some cases but many obstacles to its wider adoption exist, not least planning constraints. Such schemes would need to be cost-effective, and would probably not replace a large proportion of diesel powered movements, but could have a significant impact on reducing the level of emissions in the most polluted areas. The recent reduction in budgets to encourage modal shift to railfreight should also be reversed. Further trials of electric vehicles for last mile logistics deliveries should also be undertaken. Passenger operations involving local rail, light rapid transit schemes and hybrid / electric buses and taxis could also make more of a contribution. Such schemes should not just be assessed on their cost benefit ratios but also on the wider societal benefits, including reduced carbon impacts, that they can help deliver.

40. The DfT's Mode Shift Revenue Support Scheme (MSRS)[20], designed to provide revenue support in specific cases to secure transfer of freight from road to rail (and water), uses the evaluation of environmental benefits to justify grants under the scheme. No specific mention is made in the Guidance that these benefits include reductions in emissions of carbon dioxide, nitrogen dioxide and particulates. Inclusion of this would better align the MSRS grant scheme with government strategy on emissions reduction.

41. In calculating the environmental benefits the guidance note differentiates between "Motorways Standard" and "Motorways High Value" (Table D1.1). It is likely that all motorways in urban areas will fall in areas where there are high levels of emissions. The MSRS grant scheme would be better placed to assist in tackling high levels of emissions/air pollution if the "Motorways high value" category was reviewed and revised to include all motorways in areas of high emission levels.

42. A particular area to be reconsidered is the more specific impact arising from the recent problems encountered following increased costs and delays to rail electrification schemes. Terminating Great Western electrification east of Bath, and delaying the extension of Midland Main Line electrification north of Bedford, and relying in both cases on the use of existing diesel trains or auxiliary diesel power should only be a short term solution. The air quality disbenefits at city centre stations, some of them enclosed and affected by diesel engine emissions while trains call, should not be acceptable in the long term.

Responses to the Consultation Questions

1. How satisfied are you that the proposed measures set out in this consultation will address the problem of nitrogen dioxide as quickly as possible?	Overall the Draft Air Quality plan as presented is disappointing and unlikely to achieve the objectives because • Nearly all the measures proposed fail, on their own, one or more of the four criteria we propose of being- **targeted, deliverable, effective and affordable/value for money,** and will not on their own achieve the objectives • Only Clear Air Zones (CAZs) with charging (or other incentives and enforcement) can deliver the objective as quickly as possible; their effectiveness and acceptability will be enhanced where some or all of the other measures are implemented in parallel. This is the conclusion of the government's own Technical Report accompanying the Air Quality Plan • A charge-based CAZ is not the only option: we strongly recommend consideration should be given to exclusion-type CAZs without charging, as are to be found in some 200 towns and cities across 13 countries in continental Europe. Starting by excluding early Euro standards engines, the minimum requirements for entry into a CAZ

[20] Guide to Mode Shift Revenue Support Scheme (MSRS), Department for Transport, April 2015

	can be progressively tightened over a few years. In areas with modest exceedances this may be more acceptable and sufficiently effective (as an alternative to charging), and quicker, cheaper and less complex to introduce. "Exclusion CAZs" could migrate to charging CAZs over time as a means of tightening emissions standards
	• There are many detailed points in the text above which should be taken account of in modifying the Air Quality Plan, such as
	  ○ Enabling the adoption initially of less demanding standards (eg Euro 4 and IV, or Euro 5 and V) for charging CAZs, progressing to Euro 6 diesel and Euro VI after a short period
	  ○ Government has a role in ensuring common standards and methods apply across CAZs – even where individual schemes differ – in order to ensure for road users interoperability between towns.

2. What do you consider to be the most appropriate way for local authorities in England to determine the arrangements for a Clean Air Zone, and the measures that should apply within it? What factors should local authorities consider when assessing impacts on businesses?	• The recently published Clean Air Zone Framework, taken together with the comprehensive 253-page Technical Report, provides a formidable challenge to resource-strapped local authorities in developing practical plans. LAs will need help and advice, to avoid reinventing the wheel and incurring substantial consultancy expenditure. As an immediate measure we urge the government to establish and resource a CAZ Advisory Panel, consisting of experienced individuals with local authority experience, representatives of the ITS community, traffic management experts, and relevant government agencies and independent experts: this would help develop and promote best practice, provide an advisory resource, and enable learning from existing experience (eg TfL) and early implementation. • Where charging (or exclusion) CAZs become evidently necessary, government must provide sufficient policy and political cover to enable these to be progressed: to say in the current draft Plan that charging must be a last resort only when non-charging approaches can be demonstrated not to be effective is a time-consuming, resource-hungry and disingenuous approach, especially when the government's own Technical Report says that in most cases only charging will be effective. • Local authorities must be able to consider and propose non-charging exclusion CAZs along the lines discussed in 1. above and in the main text. • Government in their turn must very quickly be clear about their policy and commitments to those national measures which set the context for local authorities' development of their own plans – such as policy towards bus retrofit and diesel scrappage schemes; the long term support through grants of the ULEV market; the willingness to fund and support cost-effective CAZ schemes; and being tough on car manufacturers whose vehicles continue to be blatantly non-compliant in real-world conditions, and while real-world standards become embedded in new emissions testing regimes.

	• The key impacts on business will be associated with the impacts of CAZs on a) the movement of and costs to HGVs and light vans, and b) the ability for their workforce to reach their places of work. Local authorities should work closely with the business community to explore all the ways in which impacts can be mitigated while still achieving the objectives of reducing toxic emissions in the relevant areas, such as peak period only charging/exclusion, to promote a clear understanding within the business community of the wider issues, and to help ensure business is aware of government support for measures such as retrofitting.
3. How can Government best target any funding to support local communities to cut air pollution? What options should the Government consider further, and what criteria should it use to assess them? Are there other measures which could be implemented at a local level, represent value for money, and that could have a direct and rapid impact on air quality? Examples could include targeted investment in local infrastructure projects. How can Government best target any funding to mitigate the impact of certain measures to improve air quality, on local businesses, residents and those travelling into towns and cities to work? Examples could include targeted scrappage schemes, for both cars and vans, as well as support for retrofitting initiatives.	• Commit to continuation of the Low Emission Bus (LEB) scheme to grant aid retrofitting to achieve Euro VI emission standards, and introduce a similar scheme for HGVs and purpose-built taxis, ensuring where practical through the local authorities that such vehicles will be used in the relevant CAZs • We think it unlikely, based on the Technical Report's evaluation, and independent assessment such as the recent report by the RAC Foundation, that a generic scrappage schemes for diesel cars can be made cost effective. However, a targeted scrappage scheme for (purpose built) taxis licensed to operate within specific CAZs may well be cost-effective, given the usual levels of taxi utilisation. A generic scrappage scheme for light vans is unlikely to be cost-effective, but where part of an appropriate urban logistics package to consolidate deliveries and reduce vehicle movement a scrappage scheme may be cost effective. • The planning system should be used to mandate urban consolidation and smart city measures for freight and logistics; and land use planning frameworks should be used to reserve capacity for urban consolidation • Government must ensure local authorities are sufficiently well resourced to carry out the planning, evaluation, implementation and ongoing operation of CAZs. • Government to ensure the proposed CAZ Advisory Panel is well enough resourced to provide valuable advice, support and learning to the LA community – to help them develop and implement CAZ schemes in the most efficient, timely and cost-effective way. • Government should consider seriously as a new option for CAZs the exclusion-type non-charging mentioned in 1. above and in the main text. • Government should be prepared to consider alternatives to Euro VI and Euro 6 emission standards as a requirement for free access in the CAZ charging scheme – such as Euro 4 or Euro 5, certainly for an initial period. • Measures to encourage changes in travel behaviour – such as infrastructure investment in new public transport systems – can help to achieve long term solutions not only to emissions problems but more generally to congestion and reducing traffic in urban areas. But they need to be carefully targeted, deliverable within a short timescale to be relevant to achieving roadside air quality compliance in the stated timescale, be effective

How could mitigation schemes be designed in order to maximise value for money, target support where it is most needed, reduce complexity and minimise scope for fraud?	and value for money. The same goes for less capital intensive sustainable transport measures, We have already expressed the view that such measures are unlikely to be effective in reducing emissions within a few years without some CAZ disincentive and enforcement, and that value for money evaluation would need to recognise that. The government's own Technical Report (p189) says this too. • To maximise value for money and target support, it essential that proposed mitigation schemes are a) deliverable within in the timescale and b) effective, and c) that budgets and funding are set so that the best value for money plans are affordable within these budgets.
4. How best can governments work with local communities to monitor local interventions and evaluate their impact? The Government and the devolved administrations are committed to an evidence-based approach to policy delivery and will closely monitor the implementation of the plan and evaluate the progress on delivering its objective.	• An evidence-based policy would help prioritise the most effective solutions, rather than the most popular solutions. The Technical Report accompanying the draft Air Quality plan highlights and analyses many aspects of policy and policy options, measurement, design and evaluation; the resources and people involved in producing this comprehensive Technical Report should continue to be available to monitor and report both local implementation experience as well as the effectiveness of nationally-mandated measures. • Air Quality Monitoring arrangements need to be reviewed by government in order to ensure that the effectiveness of the CAZs and other policies can be effectively monitored and evaluated; LAs need to be resourced accordingly. • The technical team could usefully review and report on the development and achievements of the 200 or so LEZ schemes operational in towns and cities across 13 countries in continental Europe. • With government support, the proposed CAZ Advisory Panel has a key role in helping to collate and disseminate information, learning and best practice about local interventions across all interested authorities.
5. Which vehicles should be prioritised for government-funded retrofit schemes? We welcome views from stakeholders as to how a future scheme could support new technologies and innovative solutions for other vehicle types, and would welcome evidence from stakeholders on emerging technologies. We currently anticipate that this funding could support modifications to buses, coaches, HGVs, vans and black cabs.	• We agree that buses are the key priority for government-funded retrofit schemes, given that they are part of the solutions as well as part of the problem, and the continuation of the government's current schemes to support bus replacement with low –emission vehicles. Next, purpose-built taxis (black cabs) should be prioritised for government-funded retrofit schemes, and for possible EV development. Note the comment in the main text, based on work for *Greener Journeys*, claiming that with effective priority measures buses can deliver 75% fewer emissions per passenger-km than cars. A grant aided retrofit scheme for HGVs should be considered too; the arguments for retrofitting light vans are less clear. • The acceleration of EVs for bus, black cabs, and in the right locations and context road freight vehicles, should be a policy for the longer term, particularly for locations where air quality issues are significant; this will help to mainstream EVs also.

6. What type of environmental and other information should be made available to help consumers choose which cars to buy?	• The most important step is to ensure through legislation, enforcement and strong penalties that vehicle manufacturers and suppliers provide information that is as close to real world performance as possible. Given that, then the relevant Euro engine emissions standard for the two most toxic emissions - $NO_{x,}$ and particulate matter – compared with the actual real-world performance of the vehicle on these critical emissions types, together with CO_2 emissions performance.
7. How could the Government further support innovative technological solutions and localised measures to improve air quality?	• We strongly support the broad initiatives of the Office of Low Emissions Vehicles (OLEV) and the Low Carbon Vehicle Partnership as mentioned in the draft Air Quality Plan, and also commend the ambitious and comprehensive approach of the Mayor, GLA and TfL in mitigating the severe air quality issues in London. There should be mechanisms to ensure that lessons learned by TfL can be available to other authorities – hence our suggestion of the CAZ Advisory Panel.
8. Do you have any other comments on the draft UK Air Quality Plan for tackling nitrogen dioxide?	• The Technical Report is impressively thorough, and for government already to have consulted and now published the Clean Air Zone Framework is helpful. But the draft Air Quality Plan does not use or reflect sufficiently some of the key conclusions of the Technical Report. • Our comments in summary are: ○ The published draft Air Quality Plan shows a timidity by central government in 'owning' the overall air quality issue: too much of the responsibility for action on the ground and for developing and evaluating new packages of measures and assuring their effectiveness is placed on local authorities. Government needs to provide stronger guidance and facilitate the sharing of lessons learned and best practice between the 40-odd local authorities most of whom may have to implement Clean Air Zones (CAZs). Government needs to provide more political cover in the likely (in our view) event that charging or exclusion-only zones will be required to achieve the stated objectives. ○ The Draft Air Quality Plan treats the introduction of 'charging CAZs' as the last resort when all other non-charging measures can be shown not to be effective. This is unhelpful and disingenuous, given that the government's own comprehensive Technical Report clearly states that non-charging methods will not achieve compliance with statutory limits on roadside NO_2 concentrations within the required timescale, except where exceedances are small; and that only charging will achieve this objective. ○ Government needs to investigate and be prepared to consider – as an alternative to charging CAZs - exclusion-only non-charging CAZs: these are common across Europe with some 200 towns and cities in 13 countries using various versions of them. They may be more acceptable, can be implemented quickly at much lower cost and in less time; their minimum emissions standards can be progressively

	tightened. ○ The overall strategy should recognise that buses in particular are an essential part of the solution – providing acceptable alternatives to the private car for journeys and with current Euro standards providing much better emissions performance per passenger-km than cars. Buses should continue to be prioritised for retrofitting to achieve Euro VI standards, and incentivised under the Low Emission Bus scheme for replacement with ultra-low-emission technologies (hybrids, EVs and other technologies) or with Euro VI engines. ○ We are suggesting government should establish a CAZ Advisory Panel, bringing a small number of experienced individuals from local authorities, DfT and its relevant agencies, the ITS community and other bodies together to provide guidance, lessons learned and advice to local authorities faced with designing, developing, evaluating and implementing CAZs and related measures. ○ We recognise there are particular concerns about air quality on certain motorways and main roads providing access to London Heathrow Airport. We recommend serious consideration be given, as part of the planning and development consent process for the third runway, to the idea of Heathrow Airport being designated an Ultra Low Emission Zone (ULEZ). This should be alongside and with the same conditions and charging arrangements as the extension in 2020 or 2021 of the London ULEZ to the area inside the North and South Circular Roads, which is being considered by the London Mayor and likely to be the subject of statutory consultation later in 2017.

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