

**London Low Emission Zone Variation Order:  
Proposed deferral of the inclusion of larger vans  
and minibuses in the LEZ from 2010 to 2012**

**Supplementary Information**

**Public and stakeholder consultation**

**May 2010**

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## 1. Overview and contents

- 1.1 The London Low Emission Zone (LEZ) was introduced in February 2008, with the first phase requiring heavy goods vehicles (HGVs) over 12 tonnes to meet the Euro III standard for PM emissions. The second phase, which commenced in July 2008, required all HGVs over 3.5 tonnes, buses and coaches to meet the Euro III for PM standard. When the LEZ Scheme Order was confirmed by the Mayor in May 2007, it was originally intended that the third phase would require larger vans and minibuses to meet the Euro III for PM standard from October 2010. On 10 May 2010, the Mayor published his revised Transport Strategy (MTS), which includes a proposal to defer the extension of the LEZ to larger vans and minibuses to 2012.
- 1.2 Transport for London (TfL) is consulting the public, businesses and stakeholders on a Variation Order to defer the extension of the LEZ to larger vans and minibuses from October 2010 to January 2012. Following consultation, TfL will report to the Mayor, who will decide whether or not to confirm the Variation Order, with or without modifications.
- 1.3 The consultation on the Variation Order will run for six weeks from 17 May 2010 to 28 June 2010. The Variation Order and supporting documents can be found on the LEZ website at [www.tfl.gov.uk/lezlondon](http://www.tfl.gov.uk/lezlondon). Representations regarding the proposed date change can be made by email to [lez@tfl.gov.uk](mailto:lez@tfl.gov.uk) or in writing to:  
  
LEZ VO consultation  
Transport for London  
Windsor House  
42-50 Victoria St  
London SW1H 0TL.
- 1.4 This document describes the rationale for the Variation Order; the operation of the larger vans and minibuses phase, including the vehicles affected; the projected economic, air quality, health and social impacts of the proposed deferral; and the wider context of the Mayor's draft Air Quality Strategy (MAQS) for London.

## **2. Background to the Variation Order**

- 2.1 It was originally intended that larger vans and minibuses would be included in the LEZ from October 2010. In February 2009, the Mayor announced his intention to suspend the planned introduction of the larger vans and minibuses phase of the LEZ in 2010 in light of the economic recession. On 10 May 2010, the Mayor confirmed his intention to defer the introduction of larger vans and minibuses in the LEZ with the publication of his revised Transport Strategy. If confirmed by the Mayor, following consultation, the Variation Order would defer the implementation of the larger vans and minibuses phase to January 2012.

### **The Mayor's Air Quality and Transport strategies**

- 2.2 Following consultation with the London Assembly and functional bodies and with the public and stakeholders, the Mayor published his revised Transport Strategy on 10 May 2010. MTS proposal 95 (b) states that: "*The Mayor will defer extending the Low Emission Zone to larger vans and minibuses (which was due to commence in 2010) to 2012*". On 17 May 2010, TfL made a Variation Order to the Greater London Low Emission Zone Charging Order 2006 (the Scheme Order, confirmed by the Mayor following consultation in May 2007) to defer the extension of the LEZ to larger vans and minibuses to the proposed date of 3 January 2012. Confirmation of the Variation Order is subject to a decision by the Mayor following consultation.
- 2.3 Following consultation with the London Assembly and functional bodies, on 28 March 2010 the Mayor published his draft Air Quality Strategy (MAQS) for public and stakeholder consultation. This sets out a comprehensive approach to improving London's air quality by addressing emissions from a range of sources, including transport, with the aim of protecting the health of Londoners and meeting EU limit values.
- 2.4 The planned and proposed phases of the LEZ (including the extension of the LEZ to larger vans and minibuses; the tightening of the LEZ standard for HGVs, buses and coaches to Euro IV for PM in January 2012; and the proposed inclusion of a NO<sub>x</sub> standard for HGVs, buses and coaches in 2015) form an important part of the package of measures set out in the draft strategy. The draft MAQS includes an equivalent proposal to that in the MTS in relation to deferring the extension of the LEZ to larger vans and minibuses to 2012. It is anticipated that the MAQS will be published in autumn 2010.
- 2.5 During the consultations on the MTS and the MAQS, a number of responses were received in relation to the deferral of the larger vans and minibuses phase of the LEZ. These representations give an insight into the various stakeholder concerns and aspirations and have been considered in the development of both strategies.

- 2.6 In response to the MTS consultation, 23 stakeholders made representations commenting on the deferral of the extension of the LEZ to larger vans and minibuses. Representations from the public, businesses and other organisations on the LEZ made up less than one per cent of responses to the consultation, and the issues raised were broadly similar to those raised by stakeholders. The majority of stakeholder organisations opposed the deferral of the introduction of the larger vans and minibuses phase, including London boroughs, London Assembly Members, environmental organisations, professional associations and trade unions. The primary reason given by respondents for opposing the deferral was its adverse impact on air quality, in particular how the deferral would affect London's ability to meet EU and national air pollutant limit values. Business representative and motoring organisations supported the deferral on economic grounds, in terms of allowing operators more time to comply with the emissions standard, but asked that the Mayor consider the cost implications for businesses and voluntary organisations of any future changes to the LEZ scheme. TfL's analysis of responses to the consultation on the MTS is available at [www.london.gov.uk/publication/transport-strategy-consultation-responses](http://www.london.gov.uk/publication/transport-strategy-consultation-responses).
- 2.7 A number of boroughs also expressed concern about the deferral of the inclusion of larger vans and minibuses within the LEZ in response to the Assembly and functional bodies' draft of the MAQS, which was published in October 2009. The Greater London Authority's analysis of responses to the public consultation on the MAQS will be made publicly available following publication of the final strategy.

### **Van and minibus emissions in London**

- 2.8 Road transport is the dominant source of PM<sub>10</sub> emissions in Greater London, contributing around 60 per cent in 2008, about half of which arise from non-exhaust sources such as through tyre and brake wear. Road transport is also a significant source of NO<sub>x</sub> emissions in central London, contributing 46 per cent in 2008. In 2006, larger vans travelled 3.9 billion vehicle kilometres in Greater London, representing 12 per cent of the total vehicle kilometres travelled in London. This corresponds to an estimated 21 per cent of total road traffic emissions of PM<sub>10</sub> (12 per cent across all emission sources in London) and 10 per cent of road traffic emissions of NO<sub>x</sub> (four per cent across all emission sources in London). In recent years, volumes of vans across London have been broadly stable. However, the MTS assumes there will be growth in freight movement, with the number of vans forecast to grow by up to 30 per cent between 2008 and 2031, accounting for 15 per cent of traffic.

## **Broader influences on air quality policy**

- 2.9 The Air Quality report published by the House of Commons Environmental Audit Committee refers to studies that suggest that poor air quality reduces the life expectancy of everyone in the UK by an average of seven to eight months and up to 50,000 people a year may die prematurely because of it<sup>1</sup>. Air pollution also causes significant damage to ecosystems. The report concludes that despite these facts being known, air quality is not seen as a priority across government and the UK is failing to meet a range of domestic and European targets.
- 2.10 Transport is the major cause of exposure to harmful air pollutants, and air quality targets will not be met without a significant shift in transport policy. The Environmental Audit Committee suggests that local authorities need to do more to tackle poor air quality, and they must be given information on how to develop local air quality strategies.
- 2.11 The GLA Act 1999 requires the Mayor to include in his Air Quality Strategy policies and proposals for the achievement in Greater London of national air quality standards. These national air quality standards are based on EU limit values. Failure to meet the limit values could result in infraction proceedings against the Government which may lead to a significant fine.

## **Meeting EU limit values for PM<sub>10</sub> and NO<sub>2</sub>**

- 2.12 On 29 January 2009, the European Commission sent a warning letter to the UK Government (along with nine other Member States) over the failure to meet PM<sub>10</sub> limit values, thus launching the infraction process. The infraction process was then effectively put on hold when the UK Government submitted its time extension notification.
- 2.13 In April 2009, the Government submitted an application to the European Commission to obtain an extension for the PM<sub>10</sub> limit values for eight areas across the UK, including Greater London. A number of other EU countries are experiencing similar problems. Twenty five of the 27 Member States have exceeded the PM<sub>10</sub> limit values in at least one part of the country, normally the major cities.
- 2.14 In December 2009, the European Commission announced that it had rejected the UK Government's application for a time extension for the Greater London area. This means that the next step of the infraction process – the 'reasoned opinion' – could occur at any time. However, there is no indication from the Commission as to when, or if, this might happen.
- 2.15 The Government has now made a further submission using updated projections which show that compliance is expected to be achieved in 2011 – including in London, even with the deferral of the larger vans and minibuses phase.

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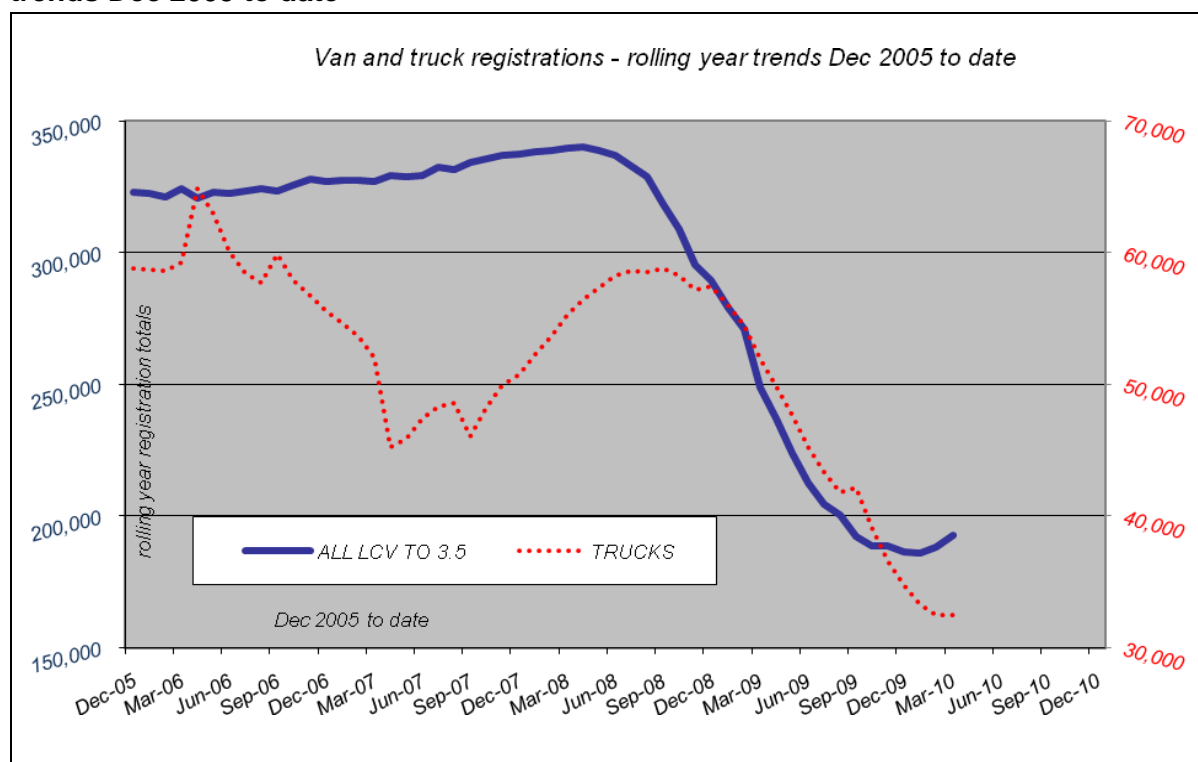
<sup>1</sup> House of Commons Environmental Audit Committee, 2009, *Air Quality: Fifth Report of Season 2009-10*, <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/229/229i.pdf>

- 2.16 The Government intends to apply to the European Commission in 2010/ 2011 for a time extension to the NO<sub>2</sub> limit values until 2015. NO<sub>2</sub> is a national problem and the application will cover many regions and cities in the UK, not just Greater London.

### **3. Rationale for the deferral**

- 3.1 It was originally intended to include larger vans and minibuses in the LEZ from October 2010. However, it should be noted that introducing the scheme in October 2010 is now no longer feasible given the lack of time to make necessary operational changes and the expectations that operators have about when they need to take action. In addition, with the publication of the MTS, any alternative proposal to not include larger vans and minibuses in the LEZ at all could only be implemented if the MTS (and draft MAQS) were to be further amended.
- 3.2 When the Mayor announced his intention to defer the larger vans and minibuses phase in February 2009, the UK was in the midst of the most severe economic recession in peacetime. The UK economy contracted for six consecutive quarters between the second quarter of 2008 and the third quarter of 2009, with total economic output declining by about five per cent over the period. Since then the economy has grown extremely slowly, with GDP increasing by 0.4 per cent in the last quarter of 2009 and 0.2 per cent in the first quarter of 2010. In contrast GDP grew at 2.7 per cent a year on average between 2001 (when the LEZ was first considered) and 2006 (when the then Mayor published his Transport and Air Quality Strategy Revisions to allow for the introduction of a London-wide LEZ).
- 3.3 A particular feature of the recession has been the financial crisis which significantly reduced the availability of credit finance. This had particular significance for operators seeking to secure credit to buy a LEZ compliant larger van or minibus.
- 3.4 Figure 1 illustrates data from the Society of Motor Manufacturers and Traders (SMMT) showing rolling yearly sales of new light commercial vehicles weighing up to 3.5 tonnes. The data shows a drop in sales between March 2008 and March 2010. In normal times around 10 per cent of the vehicle fleet is replaced annually with cleaner vehicles with newer vehicle technology but this declined to about five per cent in the recession.

**Figure 1: Van (up to 3.5 tonnes) and truck (over 3.5 tonnes) registrations – rolling year trends Dec 2005 to date**



Source: Based on data from Society of Motor Manufacturers and Traders (March 2010)

- 3.5 Deferring the introduction of the larger vans and minibuses phase will result in postponing, and to some extent reducing, compliance costs and their impact on business and the smaller voluntary organisations that operate minibuses. Relatively speaking, the same levels of compliance costs have a larger impact on businesses when margins are tight and profitability is low; the impact of such costs is also, therefore, lessened by the deferral.
- 3.6 However, delaying the implementation of the larger vans and minibuses phase will also reduce its air quality and associated health benefits. Nevertheless, with the implementation of this phase of the LEZ in January 2012 (delivering benefits in 2011) and the implementation of a range of actions set out in the draft MAQS, such as targeted local measures, it is projected that London would meet the EU limit values for PM<sub>10</sub> in 2011. Through targeted local measures shorter term action can be focussed on the areas that are at risk of exceeding the daily limit value for PM<sub>10</sub>, alongside the broader measures at a London-wide level.
- 3.7 The impacts of the deferral are analysed in more detail in the Integrated Impact Assessment of the Variation Order, which is available from the LEZ website ([www.tfl.gov.uk/lezlondon](http://www.tfl.gov.uk/lezlondon)), and are summarised in Chapter 5 of this document.



#### **4. Details of the operation of the larger vans and minibuses phase of the LEZ, as confirmed in the LEZ Scheme Order**



4.1 The London LEZ is one of the principal mechanisms through which the Mayor seeks to reduce emissions of air pollutants from ground-based transport in London. The first LEZ phase was introduced in February 2008 and required heavy goods vehicles (HGVs) over 12 tonnes to comply with a standard of Euro III for Particulate Matter (PM) in order to drive within London. The second phase, from July 2008, applied a standard of Euro III for PM to all diesel HGVs over 3.5 tonnes, buses and coaches (passenger carrying vehicles over five tonnes with more than eight seats plus the driver's seat). The next phase of the LEZ will see the tightening of the emission standard for HGVs, buses and coaches to Euro IV for PM from January 2012.

4.2 The Variation Order being consulted on proposes that the date for including larger vans and minibuses in the LEZ is deferred from 4 October 2010 to 3 January 2012. This phase will require diesel-engined larger vans and minibuses to meet the Euro III for PM standard. In addition, the Variation Order proposes a number of minor amendments to the LEZ scheme including:

- an increase of the penalty charge following clamp and removal action from £60 to £70, to bring the penalty charge in line with the Congestion Charging scheme;
- clarification of the exemption for Ministry of Defence vehicles following changes contained in primary legislation that has recently been brought into force; and
- a minor amendment to correct paragraph numbering, which was previously wrong.

The Variation Order does not propose any other changes to the operation of the LEZ scheme, as specified in the LEZ Scheme Order.

4.3 The vehicles affected by the larger vans and minibuses phase are set out in the table below:

Vehicle Type	Definition	Date Affected	Required Emissions Standard
<b>Larger vans (larger vans) and horseboxes</b> 	Diesel-engined vehicles between 1.205 tonnes (unladen) and 3.5 tonnes (gross vehicle weight); vehicle type N1, class II and III	<b>Proposed:</b> <b>3 January 2012</b>  (Previously 4 October 2010)	Vehicles registered as new with the DVLA on or after 1 January 2002 are assumed to meet the Euro III standard.  Vehicles that do not meet the emissions standards could be made to do so by modifying them to meet the Euro III for PM standard.  Operators of vehicles that do not meet the Euro III for PM standard would need to pay a daily charge of £100 to drive within the LEZ.
<b>Minibuses</b> 	Diesel-engined vehicles with more than eight seats plus the driver's seat below five tonnes (gross vehicle weight); vehicle type M2		
<b>Motor caravans and ambulances</b>	Diesel-engined motor caravan and ambulance vehicles between 2.5 and 3.5 tonnes		

4.4 The larger vans (vehicle type N1, class I) are excluded from the LEZ scheme, as are cars and motorcycles. Petrol vehicles are also excluded from the LEZ scheme. There are no plans to extend the LEZ to include these vehicles.

4.5 The LEZ applies to all roads and some motorways across most of Greater London. It operates 24 hours a day, every day of the year, and is enforced using automatic number plate recognition cameras. TfL uses data from the Driver and Vehicle Licensing Agency (DVLA), the Vehicle and Operator Services Agency (VOSA) and the SMMT to determine whether a vehicle meets the emission standards. All operators of vehicles registered outside of Great Britain which meet the emissions standard must register their vehicle with TfL to drive in the zone without having to pay a daily charge or risk incurring a penalty charge. More information on registering a vehicle is available from the LEZ website at [www.tfl.gov.uk/lezlondon](http://www.tfl.gov.uk/lezlondon).

4.6 There are very few exemptions or 100 per cent discounts from the LEZ. Such exemptions are granted on the basis that there are technical reasons why the vehicle cannot meet the required emissions standards. Larger vans or minibuses that could be exempt or entitled to a 100 per cent discount include historic vehicles built before 1 January 1973 and Showman's vehicles registered to a person following the business of a travelling showman and modified or specially constructed. There is more information about exemptions from the LEZ scheme and registering for exemptions and discounts on the website at [www.tfl.gov.uk/lezlondon](http://www.tfl.gov.uk/lezlondon).

## Compliance options

- 4.7 Owners of vehicles wishing to drive within the zone can use the compliance checker on the TfL website ([www.tfl.gov.uk/lezlondon](http://www.tfl.gov.uk/lezlondon)) to determine if their vehicles are affected by the LEZ and if they comply with the required PM standard.
- 4.8 If a vehicle is not compliant a number of options are available. Vehicle owners can avoid the LEZ, purchase a newer vehicle model (registered on or after 1 January 2002), reorganise their fleet, replace the engine, retrofit approved abatement equipment or pay the daily charge. All modified vehicles need to undergo an annual inspection and test by VOSA to prove that the LEZ standards have been met. There is more information on fitting and certifying abatement equipment on TfL's website at [www.tfl.gov.uk/lezlondon](http://www.tfl.gov.uk/lezlondon).

### *Costs of compliance*

- 4.9 The majority of operators of larger vans are in the service sector, rather than in the haulage or freight sector, while the single largest industry sector is construction. The impact on companies and private operators with smaller fleets and older vehicles could be greater, and these operators could incur higher van unit costs of compliance – assuming they went for the same sort of vehicles as the larger firms, although they may be more likely to opt for cheaper vehicle replacement. There would be some benefits for the vehicles sales and retrofit industry resulting from the LEZ scheme.
- 4.10 The majority of minibus business activity is in the 'hire and reward' and the vehicle rental sectors. Due to the high intensity of use and the trend towards contract leasing, vehicles servicing these sectors tend to be younger than in other sectors. However, a small proportion of minibus activity is related to community organisations providing mainly voluntary and charitable services. These tend to have older fleets and limited transport alternatives.
- 4.11 TfL estimates that many larger van and minibus operators would seek to replace a non-compliant vehicle with a newer second-hand vehicle model. Larger vans and minibuses that did not meet the Euro III standard for PM emissions in January 2012 would be at least ten years old. Operators could therefore purchase a compliant Euro III vehicle of up to ten years of age. Alternatively, operators may wish to purchase a more recent model, first registered on or after 1 January 2006, that met the Euro IV standard. TfL estimates a new larger van/ minibus would be in the region of £10,000 to £20,000 and for a compliant second-hand vehicle would be in the region of £1,500 to £8,000, depending on age. For example, a good quality Euro III medium length van, such as a 2004 Ford Transit 3, would cost around £3,000; a long wheelbase, 3.5 tonne Euro IV van, such as a 2007 Citroen Relay, would cost around £8,000. Newer vehicles would have relatively lower running and maintenance costs than older vehicles.

- 4.12 It is expected that a smaller proportion of operators would retro-fit particulate abatement equipment to meet the Euro III standard for PM emissions. TfL estimates that the average expected cost of compliance through retro-fitting particulate abatement equipment for larger vans would be between £1,000 and £2,000 per vehicle, with some more specialist equipment costing up to £2,500 per vehicle; for minibuses this could be between £1,400 and £2,500 per vehicle. This might be a more attractive option for more expensive vehicles.

### **Paying the daily charge**

- 4.13 If a vehicle affected by the LEZ scheme does not meet the required emissions standard described above and has not been registered as exempt or entitled to a 100 per cent discount, the vehicle would be subject to a daily charge to travel in the zone. If this charge is not paid by midnight on the next working day after the first day of travel, a Penalty Charge Notice (PCN) may be issued. A penalty charge is reduced by 50 per cent if paid within 14 days. The table below shows the LEZ charges and PCNs for the different vehicle classes affected by the proposed date change:

<b>Vehicle</b>	<b>Weight</b>	<b>Daily Charge</b>	<b>Penalty Charge Notice (PCN)</b>	<b>PCN (if paid within 14 days)</b>
<b>Large vans</b>	Between 1.205 unladen and 3.5 tonnes	£100	£500	£250
<b>Horseboxes</b>				
<b>Motor caravans</b>				
<b>Minibuses</b>	Below 5 tonnes			

- 4.14 The daily and penalty charges have been set at levels that mean that it makes economic sense for an operator to take action to make their vehicles compliant, such as fitting pollution abatement equipment, rather than pay the daily or penalty charges. Where any penalty charges remain outstanding, a warrant may be applied for and issued to bailiffs to recover the amounts due.
- 4.15 TfL will issue a 28 day warning letter instead of a PCN the first time a non-compliant vehicle is seen in the Zone in order to give registered keepers every opportunity to comply with the Scheme. If the vehicle is used in the Zone again after the 28 day warning period has expired, and it is still non-compliant, the registered keeper may be issued with a PCN.
- 4.16 The campaign to raise awareness for those vehicles affected by the larger vans and minibuses phase of the LEZ will commence from early 2011. It is proposed to include press, poster, road advertising, additional information on TfL's website and direct mail contacts.

## **5. Impacts of the deferral**

- 5.1 For this consultation TfL commissioned emissions modelling to be undertaken by King's College London's Environmental Research Group. This data has then been analysed by Paul Watkiss Associates Environmental Consultancy to provide a comparable assessment of health benefits and the economic benefit in money terms. The Integrated Impact Assessment (IIA), which has been published with this Supplementary Information, includes further analysis of the impacts of the deferral.
- 5.2 It is worth noting that TfL's analysis of the impacts of the LEZ larger vans and minibuses phase is not directly comparable with the assessment undertaken to inform the development of the LEZ scheme. Air quality modelling data has been updated to reflect information within the London Atmospheric Emission Inventory data for 2008 and new vehicle emissions factors for road transport demand by DfT in 2009. Emissions benefits and health modelling have been updated to reflect these changes.
- 5.3 In summary, the IIA shows that there would be a moderate positive economic effect and minor negative environmental and associated health effects in deferring the LEZ larger vans and minibuses phase from 2010 to 2012.

### **Vehicles affected**

- 5.4 In mid-2009, approximately one quarter of larger vans and minibuses did not meet the Euro III standard for PM emissions. TfL estimates that the extension of the LEZ to larger vans and minibuses in January 2012 would affect around 70,000 vehicles, or 12 per cent of the fleet, that would not comply with the Euro III standard for PM emissions. This compares with an estimated 90,000 vehicles, or 17 per cent of the fleet, if the LEZ was extended to larger vans and minibuses in 2010 as originally planned. The lower number of non-compliant vehicles in 2012 is as a result of continuing fleet renewal.

### **Emissions impacts**

- 5.5 TfL estimates that the effect of deferring the extension of the LEZ to larger vans and minibuses by 15 months, in terms of the emissions of air pollutants, is to reduce the magnitude of the PM<sub>10</sub> benefit by 10 per cent and of the NO<sub>x</sub> benefit by 20 per cent over the period to 2015. Consequently there is a minor negative environmental impact of the deferral. If this phase was implemented in 2010, as originally planned, it would have had a greater effect on emissions reduction.
- 5.6 The emissions calculations do not assume any reduction in vehicle kilometres. Some vehicles may potentially be deterred by the LEZ scheme and no longer come into the zone. This would result in reduction in vehicle kilometres within the LEZ and associated emissions reductions, which would be additional to those shown below.

### *PM<sub>10</sub> impacts*

- 5.7 Road transport is the dominant source of PM<sub>10</sub> emissions in Greater London, contributing around 60 per cent in 2008. Deferring the extension of the LEZ to larger vans and minibuses to January 2012 would mean that some benefits from introduction in October 2010 would be lost. However, for 2011, due to expected pre-compliance, similar emissions reductions could be expected as for a 2010 start, which contributes to the achievement of EU limit values for PM<sub>10</sub> in 2011.
- 5.8 In total, extending the LEZ to larger vans and minibuses in 2010 is estimated to save around 90 tonnes of PM<sub>10</sub> (between 2010 and 2015) compared with not including these vehicles in the scheme. Extending the LEZ to larger vans and minibuses in 2012 reduces the benefits by around one tenth, but will still save around 80 tonnes of PM<sub>10</sub> to 2015. Figure 2 below shows the estimated PM<sub>10</sub> emissions savings from the inclusion of larger vans and minibuses in the LEZ. As can be seen, the bulk of emissions savings are achieved in the lead up to (as a result of pre-compliance with the emissions standards) and immediately following the implementation of the scheme.
- 5.9 Not including larger vans and minibuses in the LEZ would mean that PM<sub>10</sub> benefits are lost. This could affect the achievement of EU limit values for PM<sub>10</sub> in 2011.

**Figure 2: Comparison of estimated PM<sub>10</sub> emissions savings from the introduction of larger vans and minibuses into the LEZ in 2010 as originally planned and in 2012 as proposed**

PM <sub>10</sub> (tonnes)	2010	2011	2012	2013	2014	2015	Total
<b>2010 launch</b>	44	33	16	5	-1	-6	91
<b>2012 launch</b>	-	32	28	15	6	0	81
<b>Difference*</b>	-44	-1	12	10	7	6	-10

Note: Numbers are rounded

### *PM<sub>2.5</sub> impacts*

- 5.10 The specific association between long term exposure to fine particles and mortality effects has also been observed for PM<sub>2.5</sub>. Emission controls for vehicles under LEZ as a whole will be effective for this fraction as well as for PM<sub>10</sub> and it should be understood that whilst the assessment here refers predominantly to PM<sub>10</sub>, the health consequences for changes in concentrations also apply to PM<sub>2.5</sub>. Smaller particles including PM<sub>2.5</sub> are associated with respiratory and cardiovascular health impacts, whilst particles from road transport, including black carbon may have an important role in climate change through their ability to trap heat in urban environments.

### *NO<sub>x</sub> impacts*

- 5.11 The inclusion of larger vans and minibuses in the LEZ is primarily focused on delivering reductions in emissions of PM<sub>10</sub> by introducing a new PM standard for these vehicles. However, as many operators will choose to upgrade their vehicles rather than retrofit particle filters it is also expected to deliver NO<sub>x</sub> benefits.
- 5.12 In total, as set out in Figure 3, introducing the larger vans and minibuses phase in 2010 is expected to save around 1,600 tonnes of NO<sub>x</sub> (over a five year period from 2010 to 2015). Introducing it in 2012, meanwhile, would save around 1,200 tonnes of NO<sub>x</sub>, a reduction of saved emissions of around 20 per cent.
- 5.13 Not including larger vans and minibuses in the LEZ would result in any potential savings being lost. This is important given the scale of the challenge in meeting EU limit values for NO<sub>2</sub> in 2015.

**Figure 3: Comparison of estimated NO<sub>x</sub> emissions savings from the introduction of larger vans and minibuses into the LEZ in 2010 as originally planned and in 2012 as proposed**

NO <sub>x</sub> (tonnes)	2010	2011	2012	2013	2014	2015	Total
<b>2010 launch</b>	530	440	280	180	100	50	1,570
<b>2012 launch</b>	-	390	380	260	150	70	1,240
<b>Difference*</b>	-530	-60	90	80	50	20	-340

Note: Numbers are rounded

### *Meeting EU limit values*

- 5.14 The GLA Act 1999 requires the Mayor to include in his Air Quality Strategy policies and proposals for the achievement in Greater London of national air quality standards, based on EU limit values for PM<sub>10</sub> and NO<sub>2</sub>. Failure to meet the EU limit values could result in infringement proceedings against the Government which may lead to a significant fine for each pollutant exceeded, recurring every year that limit values are not met.
- 5.15 TfL's analysis indicates that London is close to meeting the EU limit values for PM<sub>10</sub>; only a small number of central London locations remain at risk. London is permitted 35 exceedance days in a year at any given location. The inclusion of larger vans and minibuses in the LEZ from January 2012 is one of a number of measures in the draft MAQS that are expected to result in London meeting its EU limit values for PM<sub>10</sub> for 2011. There is a risk to compliance with EU limit values given the variations in air quality year by year due to changes in weather conditions and the contribution from external sources. Therefore, the extension of the LEZ to larger vans and minibuses in January 2012, with pre-compliance benefits in 2011, is an important element of the approach and gives greater confidence that the limit values will be met.

- 5.16 TfL's analysis indicates that including larger vans and minibuses in the LEZ from October 2010 could reduce the number of exceedance days (where the daily limit value for PM<sub>10</sub> is exceeded) at priority locations in London in 2011 by between one to two days. Deferring the inclusion of larger vans and minibuses in the LEZ to January 2012 would not impact this. An important part of this calculation is early pre-compliance during 2011 by larger van and minibus operators in order to meet the Euro III standard for PM emissions before January 2012. The reduction of between one to two days is notable given that only a small number of exceedance days need to be removed to make the priority locations in London compliant.
- 5.17 For NO<sub>x</sub>, not including larger vans and minibuses in the LEZ would mean that there are no NO<sub>x</sub> savings to contribute towards the 2015 NO<sub>2</sub> target. Given the scale of the challenge to meet these EU limit values it is important that all sources contribute to reductions in Londonwide emissions of NO<sub>x</sub>.

#### *CO<sub>2</sub> impacts*

- 5.18 Extending the LEZ to larger vans and minibuses in 2010 would have delivered some marginal benefits in reducing CO<sub>2</sub> emissions through accelerated entry into the vehicle fleet of more fuel efficient vehicles.
- 5.19 The predicted impact on CO<sub>2</sub> emissions of deferring the introduction of LEZ for larger vans and minibuses from 2010 to 2012 was assessed to be adverse in the context of London as a whole but minor, if not marginal in magnitude given the limited timeframe for deferral. The adverse impact would be greater if the LEZ was not extended to larger vans and minibuses, as any potential emissions savings would be lost.

#### **Health impacts**

- 5.20 The reduction of emissions as a result of the inclusion of larger larger vans and minibuses in the LEZ would be expected to give rise to positive health impacts for residents, especially those who tend to be disproportionately affected by air quality, such as children, the elderly and those with pre-existing conditions. The deferral of the extension of the LEZ to larger vans and minibuses to 2012 would therefore result in health benefits not materialising until 2011 (through pre-compliance) and a small reduction overall in health benefits associated with smaller emissions benefits.
- 5.21 TfL's analysis of the health benefits of the LEZ larger vans and minibuses phase is not directly comparable with the health impact assessment undertaken to inform the development of the LEZ scheme for a number of reasons. Firstly, air quality modelling data has been updated to reflect information within the London Atmospheric Emission Inventory data for 2008 and new vehicle emissions factors for road transport demand by DfT in 2009. Therefore, emissions benefits and health modelling have been updated to reflect these changes.



- 5.22 Additionally, since the health impact assessment was undertaken to inform the development of the LEZ scheme in 2006, the Department for Environment, Food and Rural Affairs (Defra) has updated its methodology for valuing the overall impact of air pollution in response to reporting by the Intergovernmental Group on Costs and Benefits. This includes new monetary values assigned to emissions of pollutants including PM<sub>10</sub> and NO<sub>x</sub> based on the type of geographical location the emissions occur in.
- 5.23 The original assessment of health benefits to inform the development of the scheme aggregated the four phases of the scheme. The emissions reductions and associated health benefits were greatest for the first two phases of the scheme that required HGVs, buses and coaches to meet the Euro III standard for PM emissions compared to the third phase. The impacts of the inclusion of larger vans and minibuses in the LEZ continues to have relatively smaller – but still important – benefits compared to the tightening of the standard for HGVs, buses and coaches.
- 5.24 TfL has estimated the monetised health benefits (net present value) to 2015 associated with the inclusion of larger vans and minibuses in the LEZ at around £3m to £30m for an October 2010 launch, and around £2m to £30m for a January 2012 launch. This calculation uses the Defra approved methodology, which ascribes unit costs per tonne of PM<sub>10</sub> and NO<sub>x</sub>. The Defra methodology is conservative and is consistent with COMEAP guidance. It captures the most obvious health impacts of air pollution but does not take into account other more minor health effects that are probably caused by air pollutants, such as restricted activity days.
- 5.25 TfL's analysis estimates that the inclusion of larger vans and minibuses in the LEZ in January 2012 would lead to a reduction in respiratory medication use in children of around 1,200 days to 2015; a 2010 launch would lead to reduction of around 1,500 days to 2015, suggesting the deferral would reduce this benefit by around 15 per cent. In terms of restricted activity days<sup>2</sup>, a 2012 launch would lead to a reduction of around 31,000 days to 2015, while a 2010 launch would lead to a reduction of around 37,000 days to 2015, suggesting the deferral similarly would reduce this benefit by around 16 per cent. In terms of respiratory hospital admissions, a 2010 launch would lead to a reduction in five cases to 2015, compared with four cases for a 2012 launch.
- 5.26 The European CAFE method was used as a sensitivity in the development of the previous phases of the LEZ. This approach attaches higher benefits to NO<sub>x</sub> reductions and includes European benefits (i.e. from trans-boundary pollution). This approach gives monetised health benefits of around £20m to £60m for a 2010 launch and around £15m to £45m for a 2012 launch.

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<sup>2</sup> Restricted activity days refers to restrictions on individual's ability to complete every day activities through ill-health caused by poor air quality.

- 5.27 In addition to these benefits, the introduction of larger vans and minibuses into the LEZ would affect vehicles that also drive outside London, and could therefore have wider associated health benefits outside London. These benefits are complex to estimate because they depend on operator behaviour. In cases where operators fit abatement equipment, or scrap and replace older vehicles, there are emissions benefits outside London. However, if operators remove older vehicles from London routes and switch these to routes outside London, there can be disbenefits. It is estimated that the potential effects of including larger vans and minibuses in the LEZ are likely to lead to modest increases in net benefits that would add to the modelled health benefits in London.
- 5.28 The inclusion of larger vans and minibuses in the LEZ could have some adverse socio-economic consequences for some small businesses, individuals and community groups and those who are reliant upon community owned vehicles (which are non-compliant) for transportation. Some of these groups will provide health and wellbeing services. Were these services to be adversely affected this could have an impact (although likely to be small) on health and wellbeing.
- 5.29 While somewhat uncertain, the overall health impact of the proposed deferral is considered to be negative, but only of a minor magnitude. However, relative to the option of not including larger vans and minibuses in the LEZ at all, the proposed later implementation in 2012 still confers an important benefit, albeit delayed for 15 months.

### **Economic impacts**

- 5.30 The total compliance cost facing all operators is expected to reduce by around £30m from the deferral to 2012 of this phase of the LEZ. The deferral would therefore have a significant positive impact on small business and other operators of non-compliant vehicles.
- 5.31 The compliance costs to operators reflect the net impact once costs which would have been incurred regardless of introducing the scheme have been removed. The costs of the various compliance alternatives relate to industry outlays of between £40,000 to £70,000 per year 'standing and running' costs of operating a light commercial vehicle. For many small operators, upgrading to a compliant second-hand vehicle, at a cost of between £1,500 and £8,000 (which could be up to nine years old) or retro-fitting existing vehicles with a PM trap, at a cost of around £1,000 to £2,000 (with some more specialist equipment costing up to £2,500) remain economical ways to compliance.
- 5.32 TfL estimates that in 2010, around 90,000 vehicles would not have been compliant with the new LEZ standards for larger vans and minibuses. By 2012 this figure is expected to have fallen to around 70,000 vehicles, taking into account natural vehicle replacement.

- 5.33 The total compliance costs for these vehicles depend on the replacement choice made by operators. Based on estimations of operator behaviour, in 2010, compliance costs for operators were expected to be in the region of around £115m to £130m. In 2012, this is expected to fall to around £85m to £100m, resulting in a reduction in costs for operators of around £30m.
- 5.34 It is important to also consider the wider context. Should the EU limit values for PM<sub>10</sub> and NO<sub>2</sub> not be met, infraction proceedings against the Government could lead to significant fines. The figure of £300m has been suggested for some years as the amount that the UK Government could be fined if it was found to be in breach of limit values. It is not clear what basis there is for this, but it might not be unrealistic. The fine would be calculated on the basis of a lump sum (min 11m Euros) plus a periodic payment, based on the seriousness of the offence and the capacity of the Member State to pay. As an example, in 2005 France was fined a lump sum of 20m Euros plus a payment of 58m Euros for every six months that the country was in breach of an environmental directive.

### **Equalities and social impacts**

- 5.35 The Equalities Impact Assessment undertaken to guide the development of the scheme identified that the inclusion of minibuses in the LEZ could have a disproportionate impact on schools and charities which contribute to London's rich educational, cultural, heritage and sporting life, often on very restricted finances. Consequently, deferring the extension of LEZ to larger vans and minibuses could have a minor positive social impact on these groups and the services they provide. It is recognised, however, that minibuses which would no longer be subject to the emissions control would be less environmentally sustainable during the period of the proposed deferral.

### **Deferral benefits and costs**

- 5.36 Figure 4 below summarises the estimated costs and benefits of the larger vans and minibuses phase and the deferral of the extension of the LEZ to include larger vans and minibuses from October 2010 to January 2012.
- 5.37 The analysis of benefits and costs is determined by comparison of the cost of operator compliance with the monetised health benefits of the scheme. TfL costs to implement the scheme are incremental, as the policy largely utilises existing infrastructure and provides a critical policy lever to reduce emissions from a new class of vehicle, providing scope for action on air quality in an area where there are relatively few policy options.
- 5.38 It is important to target different sources using the levers available. In contrast, TfL has more options for reducing emissions from taxis and buses using the leverage the Mayor and TfL have in terms of licensing and contracting services.

- 5.39 The costs of compliance for operators are derived by assigning a number of vehicles to each possible compliance action and determining the cost per vehicle for each action. The assumptions around the likely operator response are based on an operator survey completed in 2006 to inform the consultation on the LEZ Scheme Order, on actual responses seen during the first two LEZ phases and on professional judgement.
- 5.40 As the precision of the numbers available is relatively limited and there are a number of uncertainties, an approach utilising ranges has been adopted. This approach is considered to give a more realistic view of the likely costs and benefits.
- 5.41 The primary benefits of the inclusion of larger vans and minibuses in the LEZ scheme are the air quality and associated health improvements both inside and outside Greater London through reductions in PM<sub>10</sub> and NO<sub>x</sub> emissions from road traffic. There are also associated health benefits as a result of reductions in emissions of PM<sub>2.5</sub>, which is linked with respiratory and cardiovascular health impacts, and as a result of reductions in black carbon, which may have an impact on climate change through its ability to trap heat in urban environments.
- 5.42 There are secondary and other non-health benefits as a result of reductions in emissions from road transport and further unquantified reputational benefits for London as a result of the perception of London as a more pleasant place to live and work and a progressive and proactive city in terms of improving local air quality.

**Figure 4: Analysis of costs and benefits of deferring the extension of the LEZ to larger vans and minibuses**

(£ million to 2015)	Compliance costs	Monetised health benefit	
		(Defra method)	(CAFE method)
<b>2010 launch</b>	£115m – £130m	£3m – £30m	£20m – £60m
<b>2012 launch</b>	£85m – £100m	£2m – £30m	£15m – £45m
<b>Difference</b>	£30m	£1m – £0	£5m – £15m

- 5.43 As can be seen in Figure 4, the compliance costs for operators with the emission standard for a January 2012 launch is lower than that for an October 2010 launch. However, there is also a reduction in the monetised benefits. In weighing up whether to include a proposal in his Transport and Air Quality strategies to defer the extension of the LEZ to larger vans and minibuses, the Mayor considered this loss in benefits against the reduced costs for operators as a result of having longer to comply with the scheme. The economic situation is a key consideration for the Mayor and TfL, with the severe recession and restriction in credit from 2008 onwards leading to greater than anticipated impacts for operators of complying with the scheme. While the deferral reduces the environmental benefits somewhat, the analysis shows that London would still meet the EU limit values for PM<sub>10</sub> in 2011.

- 5.44 The LEZ provides a tried and tested mechanism available to the Mayor to achieve reductions in emissions from road transport. This is particularly important in the absence of more action at the national level. Meanwhile, emissions from buses, coaches and HGVs are already targeted by the earlier phases of the LEZ and will be tightened to the Euro IV standard for PM emissions in the next phase, which commences in January 2012. It is important that reductions in emissions from larger vans and minibuses, which contribute a significant proportion of harmful air pollutant emissions, are also delivered – and the inclusion of these vehicles in 2012 delivers important reductions in PM<sub>10</sub> and NO<sub>x</sub> emissions over the life of the project. While there would be no costs to operators of not including larger vans and minibuses in the LEZ at all, there would also be no resultant reductions in emissions or associated health benefits. Furthermore, there would be other implications of not including larger vans and minibuses in the LEZ, with revisions required to both the Mayor's Transport and Air Quality strategies.
- 5.45 Using the Defra method provides an estimate of health benefits to 2015 of between around £2m and £30m for a 2012 launch and between £3m and £30m for a 2010 launch, a reduction of between 12 and 15 per cent. Using the alternative CAFE method would give a higher estimate of benefits as it attaches higher benefits to NO<sub>x</sub> reductions and includes European benefits. This would give estimates of £15m to £45m for a 2012 launch and £20m to £60m for a 2010 launch. This method is not used by Defra. However, some people argue that the Government is understating potential benefits. The House of Commons Environmental Audit Committee reported that the current analysis of the health impacts of air pollution was likely to significantly understate health benefits, suggesting that the risks from poor air quality could be even higher. They have recommended that the Government should improve the way that the costs and benefits of action on air quality are calculated. The report noted that the current approach does “not account for all the health effects of poor air quality, the damage to ecosystems and potential fines”.
- 5.46 As can be seen in Figure 4, the estimated costs of compliance are considerably higher than the estimated health benefits associated with the reduction in emissions. The background level of particulate matter present in London's air has been decreasing and, as the Capital approaches the EU limit values for PM<sub>10</sub>, the number of people affected reduces. Therefore, monies invested to tackle the remaining challenge in this regard return a proportionately smaller health benefit, when considered in isolation, as this phase of the scheme is acting on a diminishing problem. Nonetheless, these health benefits are not insubstantial and are important to the individuals affected, for example extending the LEZ to larger vans and minibuses in January 2012 is estimated to result in some 400 less days of respiratory medication use in children (to 2015) and around 10,000 fewer restricted activity days to 2015. It is considered that the LEZ strikes a balance between the costs imposed and the environmental and health benefits, particularly when compared to other potential action that might deliver similar emissions reductions, such as an age-based scheme.

- 5.47 The House of Commons Environmental Audit Committee recommends that “the Government must assess the most cost effective way of meeting mandatory EU targets rather than relying only on a cost-benefit analysis of possible actions”. The LEZ scheme is a key policy lever in ensuring that London meets the legally required standards for air quality. Emissions reductions as a result of pre-compliance with the LEZ Euro III standard for PM emissions in the lead-up to January 2012 are important in terms of meeting the EU limit values for PM<sub>10</sub> in 2011. Without this phase of LEZ, there would be a significant risk that EU limit values would not be achieved for PM<sub>10</sub> in 2011 (and also an additional gap in relation to NO<sub>2</sub> in 2015).
- 5.48 Should the EU limit values for PM<sub>10</sub> and NO<sub>2</sub> not be met, infraction proceedings against the Government could lead to significant fines, potentially in the region of £300m per year, for each pollutant.

## **6. Measures in the Air Quality Strategy to further improve air quality in London**

- 6.1 The inclusion of larger vans and minibuses in the LEZ is part of a broader package of measures included in the draft MAQS to reduce harmful air pollutant emissions in London. Consequently, any impacts need to be understood in this broader context. Overall, implementation of the policies and proposals in the Strategy along with natural fleet turnover is expected to reduce PM<sub>10</sub> emissions in central London by around 13 per cent by 2011 and by about a third by 2015 (compared to 2008). In central London, emissions are estimated to reduce from about 135 tonnes in 2008, to 119 tonnes in 2011, and to about 91 tonnes in 2015. These reductions will be achieved through the range of measures included in the MAQS, in addition to the air quality improvement measures that are at present being undertaken. Based on TfL modelling, the Mayor is confident that London will meet the EU limit value for PM<sub>10</sub> in 2011 even with deferring the larger vans and minibus phase of LEZ to 2012.
- 6.2 The draft MAQS also projects reductions in PM<sub>10</sub> emissions from all sources more widely across Greater London. Modelling suggests that, compared to 2008, emissions of PM<sub>10</sub> in Greater London will be reduced by around ten per cent by 2011 and by around 20 per cent by 2015. This does not take into account PM from sources outside London
- 6.3 Through its Business Plan, TfL is already committed to transport measures that will directly or indirectly help reduce emissions of PM and NO<sub>x</sub>. There is a package of measures underway or proposed which aim to promote the use of cleaner forms of transport such as walking, cycling and public transport; alter the way that the transport network is managed, such as the London Permit Scheme for streetworks; and encourage the take up of ‘greener’ vehicles such as electric vehicles and hybrid buses.

6.4 In terms of off-setting any potential impacts of deferring the inclusion of larger vans and minibuses in the LEZ, the proposed local measures in the MAQS are particularly important. Crucially, these can be implemented quickly. In its evidence to the Government regarding the achievement of PM<sub>10</sub> limit values for London, the GLA estimates that, based on evidence from other cities, a reduction of up to 2.5µg/m<sup>3</sup> at the priority locations can be reasonably expected, equivalent to reductions of between 10 and 20 per cent in concentrations. However, in order to allow a more cautious and realistic assessment, only half the exceedance days that modelling suggests could be achieved if the measures in the draft MAQS were implemented have been assumed. This indicates a reduction in daily exceedances at the priority locations in central London of around six days, which is significant in the context of meeting EU limit values, as only a small number of exceedance days would need to be removed to meet the daily EU limit values for PM<sub>10</sub> in 2011.