

# Revised Mayor's Transport Strategy Integrated Impact Assessment: Report on the Assessment of the Proposal to Defer Low Emission Zone Phase 3 from 2010 to 2012

Updated for the public and stakeholder consultation on a Variation Order to modify the Greater London Low Emission Zone Charging Order 2006.

Initially prepared by MVA Consultancy in Association With ERM and Future Inclusion in October 2009 and updated by Transport for London in April 2010.

Please note: while the Mayor's Transport Strategy and the Mayor's Air Quality Strategy refer to the 'extension of the Low Emission Zone to include LGVs and minibuses', this report uses the shorthand 'LEZ Phase 3'.

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# 1 Introduction

**The purpose of this Impact Assessment is to outline the assessment undertaken on the Variation Order to defer the implementation of Phase 3 of the Low Emission Zone (LEZ) Scheme from 2010 to 2012. The assessment establishes the baseline conditions (i.e. LEZ introduced in 2010 as previously planned) and assesses the predicted impacts of the proposal as well as an alternative.**

## 1.1 Why has the Impact Assessment been updated?

- 1.1.1 Proposal 95 (b) in the revised Mayor's Transport Strategy ("MTS") provides for the deferral of the implementation of Phase 3 of the Low Emission Zone ("LEZ") from 2010 to 2012: "*The Mayor will defer the implementation of Phase three of the scheme covering LGVs and minibuses (which was due to commence in 2010) to 2012*". For the purposes of this assessment, this is referred to as the proposed deferral of LEZ Phase 3.<sup>1</sup>
- 1.1.2 This proposal was originally assessed as part of the Integrated Impact Assessment ("IIA") undertaken for the public and stakeholder consultation on the MTS. As part of this process an appendix was prepared which looked in more detail at the potential impacts of the proposal. This impact assessment is an update of that document.
- 1.1.3 Now that the Mayor has confirmed the Transport Strategy and TfL is about to commence a public and stakeholder consultation on a Variation Order to the Low Emission Zone Scheme Order it is considered appropriate to update this Impact Assessment to reflect latest information and recent developments. In particular, a final implementation date in 2012 has now been proposed – 3 January. The period of deferment is therefore 15 months. In the original MTS Impact Assessment on deferring LEZ Phase 3 it was assumed that the deferment period would more likely be two years. Accordingly some impacts need to be reassessed.
- 1.1.4 On 28<sup>th</sup> March 2010 the Mayor published his draft Air Quality Strategy ("MAQS"). This contains more detail about the broader suite of measures that the Mayor has proposed to improve London's air quality. These assist in assessing the air quality impacts of deferring LEZ Phase 3 and the potential need for further mitigation.
- 1.1.5 Furthermore, the draft MAQS contains more detailed emissions and concentrations modelling. This has been undertaken by King's College London's Environmental Research Group (ERG). ERG have been able to use the latest emissions factors from the 2008 London Atmospheric Emissions Inventory, increasing the accuracy of the modelling. This has been complemented by refinements to TfL's assumptions, for example about the number of vehicles that would be affected.
- 1.1.6 Given these factors it was considered appropriate to update the assessment previously undertaken.

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<sup>1</sup> It should be noted that this proposal has previously been alluded to as a 'suspension'; within the context of the Revised MTS the proposal is to defer the start of LEZ Phase 3 to January 2012.

## 1 Introduction

### 1.2 Role of this Impact Assessment

- 1.2.1 This document provides more detailed assessment around the potential impacts of this specific proposal to determine what impacts may be likely to arise as a consequence and whether they are significant. This assessment also considers an alternative: that of not introducing Phase 3 at all.
- 1.2.2 However, it should be noted that introducing the scheme in 2010 is 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. It is also important to note that now that the MTS has been confirmed, a 'do not introduce LEZ Phase 3 at all' option could only be implemented if the MTS (and the Mayor's draft Air Quality Strategy) were to be further amended.
- 1.2.3 While this is not a statutory assessment, to ensure consistency of approach and assessment the proposal to defer has been assessed using the same approach outlined within the main body of the IIA Report for the draft MTS, and using the same IIA Assessment Framework. This IIA assessment comprises a strategic level assessment of a London-wide transport strategy following the guidance in paragraphs 2.22 to 2.2.4 of the Practical Guide to Strategic Environmental Assessment (ODPM 09/2005). In addition it meets the requirements of Equalities Impact Assessment, Health Impact Assessment and Assessment of Environmental Impacts, whilst also taking into account the Habitat Regulations Assessment Screening.
- 1.2.4 This document, therefore, details the findings of the specific assessment of deferring the implementation of LEZ Phase 3 from 2010 to 2012 using the MTS IIA Assessment Framework.

### 1.3 Structure of this Impact Assessment

- 1.3.1 The subsequent sections in this Impact Assessment are as follows:
- Section 2: The role of the Low Emission Zone and Phase 3;
  - Section 3: Setting the context: baseline conditions;
  - Section 4: Other air quality measures;
  - Section 5: Assessment findings; and
  - Section 6: Summary of assessment, recommendations for mitigation and monitoring provision.

## 2 The role of the Low Emission Zone and Phase 3

### 2.1 The Low Emission Zone

- 2.1.1 The London Low Emission Zone scheme ("LEZ") is one of the principal mechanisms through which the Mayor seeks to reduce emissions of air quality pollutants arising from transport related activities within London. The scheme commenced in 2008 with the aim to bring forward improvements in air quality standards that would otherwise happen through natural vehicle replacement. Put simply, it seeks to induce the early uptake of cleaner vehicles and reduce emissions which would otherwise arise.
- 2.1.2 The LEZ forms part of a range of existing and proposed air quality improvement initiatives in the Mayor's draft Air Quality Strategy ("MAQS") and also as part of the focus on reducing transport related emissions in the MTS. The scheme has an important role as part of the wider package of measures to help London meet UK and European air quality objectives and deliver health benefits for Londoners.
- 2.1.3 The LEZ was first considered in 2001 when a feasibility study was undertaken on behalf of the GLA, TfL, the Association of London Government (now London Councils), DfT and Defra. The Study endorsed the use of LEZ as a means to help achieve air quality objectives in London. In early 2005, TfL completed a review of the findings from the Feasibility Study, and in June 2005, the Mayor delegated responsibility to TfL to prepare and consult on revisions to his MTS and MAQS for the introduction of a London-wide LEZ scheme. Following consultation, the Mayor published his MTS and MAQS Revisions on 25 July 2006. This was followed by a public and stakeholder consultation on the detailed LEZ Scheme Order.
- 2.1.4 The current proposal to defer the introduction of Phase 3 of LEZ from 2010 to 2012 follows from Proposal 95 (b) in the Mayor's Transport Strategy. This sets out the rationale for deferring the planned introduction of the scheme in 2010 to 2012, given the current economic circumstances. The proposal forms part of the suite of policies and proposals in the Revised MTS and Draft MAQS.
- 2.1.5 Given that the Scheme Order for the Low Emission Zone (covering all four phases of LEZ, including Phase 3) was consulted upon in 2006 and approved by the then Mayor in 2007, only deferral of the start date for LEZ Phase 3 is being considered by the current consultation.

### 2.2 LEZ aims

- 2.2.1 The LEZ is primarily aimed at delivering reductions in emissions to air by introducing cleaner vehicles into the vehicle fleet through replacement or encouraging retrofitting of vehicles in advance of the normal replacement cycle, and thereby assisting the achievement of associated health and environmental benefits. Vehicle owners affected incur costs to ensure that their vehicle is compliant or are subject to a charge for driving a non-compliant vehicle in the zone. Thus, the effect of the LEZ is to pro-actively promote the uptake of vehicles that have lower emissions i.e. to encourage 'cleaner' vehicles on London roads.

## 2 The role of the Low Emission Zone and Phase 3

- 2.2.2 The LEZ assumes a role not just within the context of improving London's air quality but also as a contributor to the achievement of the UK Government's objective to meet European air quality limit values for the nation as a whole.
- 2.2.3 The EU Air Quality Directive<sup>2</sup> required compliance with the limit values for PM<sub>10</sub><sup>3</sup> by January 2005 and for the NO<sub>2</sub><sup>4</sup> limit values by January 2010. The limit value for daily average PM<sub>10</sub> is not being achieved in London in a small number of areas. In line with the provisions of the EU 2008 Air Quality Directive, the UK Government has applied to the European Commission to extend the date for compliance with the daily average PM<sub>10</sub> limit value in Greater London until 2011. LEZ Phase 3 will provide extra confidence that the PM<sub>10</sub> limit values will be met in London in 2011 and maintained thereafter. The UK Government is expected to make a similar application for a time extension to 2015 for the annual mean NO<sub>2</sub> limit value, which is currently being exceeded in many parts of London. LEZ Phase 3 also contributes to NOx reductions across London.

### 2.3 Key stages of the Scheme

- 2.3.1 The LEZ was originally proposed to be implemented in four chronological stages:
- Phase 1 – commenced in February 2008 – requires heavy goods vehicles (HGVs) over 12 tonnes Gross Vehicle Weight (GVW) to meet the Euro III particulate matter (PM) emission standard to drive within a designated zone of Greater London (the Low Emission Zone or LEZ) without paying a charge;
  - Phase 2 – commenced in July 2008 – requires lighter HGVs (between 3.5 to 12 tonnes GVW) and buses and coaches over 5 tonnes with more than 9 seats to meet the Euro III for PM standard to drive within the Low Emission Zone without paying a charge;
  - Phase 3 – originally planned to be implemented in October 2010 – would require Light Good Vehicles (LGVs)<sup>5</sup> (between 1.205 unladen and 3.5 tonnes GVW); motor caravans and ambulances (between 2.5 and 3.5 tonnes GVW); and minibuses with more than 9 seats<sup>6</sup> but weighing less than 5 tonnes GVW to meet the Euro III for PM standard to drive without charge; and
  - Phase 4 – due to be implemented in January 2012 – will require HGVs over 3.5 tonnes GVW and buses and coaches over 5 tonnes GVW with more than 9 seats<sup>7</sup> to meet Euro IV for PM standard to drive without charge.
- 2.3.2 LEZ as a scheme is, therefore, already operational through the implementation of Phases 1 and 2. Phases 3 and 4 of LEZ are the forthcoming phases yet to be introduced but whose purpose and scope are pre-defined under the terms which introduced the scheme as a whole.

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<sup>2</sup> Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe

<sup>3</sup> Particulate matter (PM) is a complex assemblage of non-gaseous material of varied chemical composition. It is categorised by the size of the particle (for example PM<sub>10</sub> is particles with a diameter of less than 10 microns).

<sup>4</sup> All combustion processes produce oxides of nitrogen (NOx). In London, road transport and heating systems are the main sources of emissions. NOx is primarily made up of two pollutants – nitric oxide (NO) and NO<sub>2</sub>. NO<sub>2</sub> is of most concern due to its impact on health, however, NO easily converts to NO<sub>2</sub> in the air – so to reduce concentrations of NO<sub>2</sub> it is essential to control emissions of NOx.

<sup>5</sup> TfL uses the phrase 'larger vans' instead of LGVs in its publicity to aid understanding.

<sup>6</sup> Vehicles comprising 8 passenger seats plus 1 driver's seat

<sup>7</sup> Vehicles comprising 8 passenger seats plus 1 driver's seat

## 2 The role of the Low Emission Zone and Phase 3

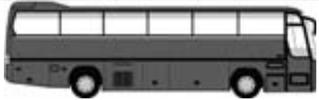
This assessment, therefore, considers the benefits of Phase 3 in the context of the broader LEZ scheme.

2.3.3 While the requirements for LEZ have been structured around the particulate matter element of the Euro standards, the LEZ also delivers NO<sub>x</sub> and CO<sub>2</sub> benefits by bringing forward the replacement of non-compliant vehicles. This results in improvements in these emissions.

2.3.4 The revised MTS and draft MAQS notes the potential for the future introduction of an additional LEZ phase introducing a NO<sub>x</sub> standard for HGVs, buses and coaches from 2015. However, this proposal is subject to ongoing feasibility studies and consultation before its potential implementation in 2015. This assessment has not, therefore, considered this proposal.

2.3.5 The table below summarises when each type of vehicle included in the Low Emission Zone would be affected:

**Table 1: Summary of types of vehicle included in the Low Emission Zone**

Vehicle type and definition		Date affected & required emissions standards <sup>8</sup>	Vehicle compliance
<b>Heavier HGVs.</b> Heavy diesel-engined vehicles exceeding 12 tonnes gross vehicle weight (GVW), including goods vehicles, motor caravans, motorised horse boxes and other specialist vehicles		4 February 2008 Euro III for PM  3 January 2012 Euro IV for PM	Vehicles first registered as new with the DVLA on or after 1 October 2001 are assumed to meet the Euro III standard.  Vehicles first registered as new on or after 1 October 2006 are assumed to meet the Euro IV standard.
<b>Lighter HGVs.</b> Heavy diesel-engined vehicles between 3.5 and 12 tonnes GVW, including goods vehicles, motor caravans, motorised horse boxes and other specialist vehicles		7 July 2008 Euro III for PM	Vehicles that do not meet the required emissions standards can be modified to do so or would need to pay a £200 daily charge to drive in the zone.
<b>Buses and coaches.</b> Diesel-engined passenger vehicles with more than eight seats, plus the drivers seat, exceeding five tonnes GVW		3 January 2012 Euro IV for PM	

<sup>8</sup> There are two types of Euro emissions standards. Heavy duty standards (denoted by Roman numerals) for engines fitted to vehicles over 5 tonnes, and light duty standards (denoted by Arabic numerals) for engines fitted to vehicles under 5 tonnes.

Vehicle type and definition		Date affected & required emissions standards <sup>8</sup>	Vehicle compliance
<b>LGVs.</b> Diesel-engined vehicles (including horse boxes) between 1.205 tonnes unladen and 3.5 tonnes GVW, and motor caravans and ambulances between 2.5 tonnes and 3.5 tonnes GVW		Proposed start date 3 January 2012 Euro 3 for PM  <i>(NB: originally 4 October 2010)</i>	Vehicles first registered as new with the DVLA on or after 1 January 2002 are assumed to meet the Euro 3 standard.
<b>Minibuses.</b> Diesel-engined passenger vehicles with more than eight seats, plus the drivers seat, below five tonnes GVW			Vehicles that do not meet the required emissions standards can be modified to do so or would need to pay a £100 daily charge to drive in the zone.

## 2.4 Pre-compliance and non-compliance

- 2.4.1 The introduction of each phase of LEZ has the effect of promoting compliance prior to the actual date of implementation, as vehicle operators invest in compliant vehicles ahead of the deadline. Compliance does not have to be achieved by vehicle replacement; retrofitting an appropriate emission control system to a vehicle is also an option as is fitting a new engine. The result of this effect is to achieve a reduction in emissions ahead of the date of implementation. TfL's analysis of LEZ implementation to date indicates that during the year before Phases 1 and 2 of LEZ were introduced (2007), 'operator pre-compliance' with the requirements of the scheme had already delivered about half of the changes to vehicles and emissions that TfL expected in 2008, when full compliance with the requirements of each phase would be expected. Greater pre-compliance benefits for LEZ Phase 3 commencing in 2012 could be reasonably expected in the year before (i.e. 2011), given that under this proposal the scheme commences at the start of January (compared to October for the original 2010 proposal)<sup>9</sup>. Early pre-compliance may have been aided by the availability of the National Scrappage Scheme in 2009 and early 2010, which was expanded so that most vehicles affected by LEZ Phase 3 were eligible.
- 2.4.2 When considering each phase of LEZ it is therefore important to recognise their respective impacts some time prior to, as well as during, phase implementation. Once each phase is implemented consideration then turns to the impacts of the compliance rate achieved and resulting impact on emissions.

<sup>9</sup> TfL 2008 London Low Emission Zone Impacts Monitoring: Baseline Report

## 2.5 The Variation Order

- 2.5.1 In February 2009, the Mayor announced his intention to suspend the planned introduction of LEZ Phase 3 in 2010, in light of the economic recession and its potential impact on small businesses, charities and self-employed Londoners in this context. LEZ Phase 3 will require larger vans and minibuses to meet a minimum Euro 3 PM standard. TfL have, therefore, made an Order to defer the implementation of this phase to January 2012. Phase 4 of LEZ, requiring HGVs, buses and coaches to meet a Euro IV PM standard, will continue to be implemented as planned, also in 2012<sup>10</sup>. The proposal to defer the implementation of Phase 3 until 2012 is included as Proposal 95(b) in the revised MTS and also requires a variation to the LEZ Scheme Order. The Variation Order will be subject to public consultation and will need to be confirmed by the Mayor having regard to responses to this consultation and other statutory criteria.
- 2.5.2 The proposal being assessed is the deferral of the introduction of Phase 3 of LEZ from 2010 to 2012. This phase was and is intended to focus specifically on LGVs and minibuses, with the central aim of introducing cleaner vehicles in this category through either the early replacement of old vehicles or retro-fitting.
- 2.5.3 The deferral of LEZ Phase 3 from 2010 to 2012 is hereafter referred to as 'the proposal' or 'deferral of Phase 3' in this document.

## 2.6 The rationale for the deferral

- 2.6.1 The Variation Order to defer the introduction of Phase 3 until January 2012 has been made because of the current economic circumstances. It is recognised that economic conditions have been adverse. When the Mayor announced his intention to defer the LGV and minibuses phase of LEZ in February 2009, the UK was in the midst of the severest economic recession in recent times. 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 5% over the period. Since then the economy has grown extremely slowly, with GDP increasing by 0.4% in the last quarter of 2009 and 0.2% in the first quarter of 2010. In contrast GDP grew at 2.7% a year on average between 2001 (when LEZ was first considered) and 2006 (when the then Mayor published MTS and MAQS revisions including LEZ).
- 2.6.2 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 new compliant vehicle. This would be in the region of £10,000 to £20,000 for a new compliant vehicle (or between £1,500 to £8,000 for a compliant second-hand vehicle).
- 2.6.3 Data from the Society of Motor Manufacturers and Traders (SMMT) shows rolling yearly sales of new Light Commercial Vehicles to 3.5 tonnes fell dramatically from 340,000 in March 2008 to below 200,000 in March 2010. Based on the drop in new vehicle sales it is estimated that vehicle replacement rates declined by about a half over the recessionary period. In normal

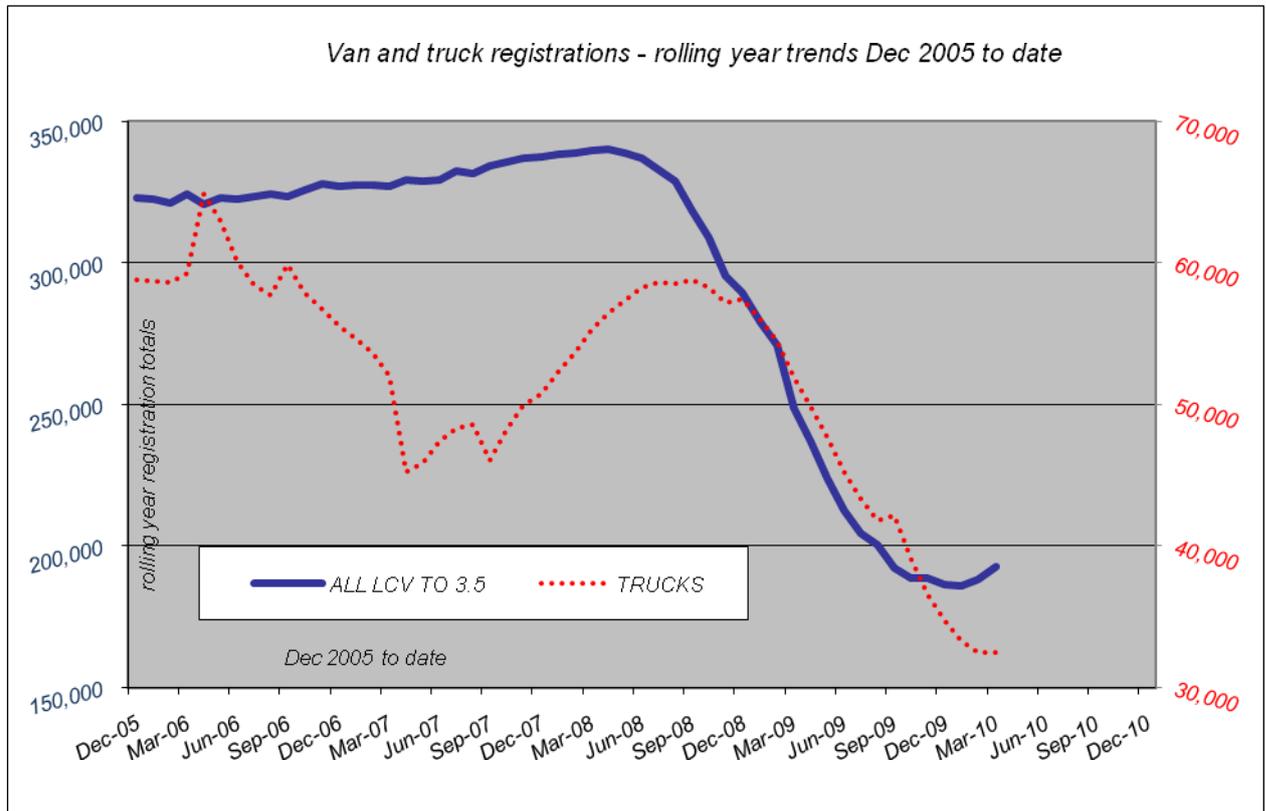
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<sup>10</sup> The MTS notes this as *"The implementation of Phase four of the scheme in 2012, introducing a further tightening of emission standards (to Euro IV PM) for HGVs, buses and coaches, will deliver further benefits for air quality."*(para 649)

times around 10% of the vehicle fleet is replaced annually with cleaner, new engine technology vehicles but this declined to about 5% in the recession – see figure 1 below.

**Figure 1: Van and truck registrations – rolling year trends Dec 2005 to date**

Source: Society of Motor Manufacturers and Traders (March 2010)



- 2.6.4 The Variation Order will result in postponing, and to some extent reducing, compliance costs and their impact on businesses. Relatively speaking, the same level 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 deferral.
- 2.6.5 During the consultation on the MTS, a number of responses were received that related to LEZ Phase 3 which give an insight into the various stakeholder concerns. While most stakeholders supported the continued implementation of LEZ Phase 3 and associated environmental benefits, a number of stakeholders (especially those representing business interests) noted the impacts of the recession and the potential economic impact of LEZ Phase 3 on small businesses.
- 2.6.6 This assessment notes the context within which the proposal is being put forward and considers the drivers for the proposal within the context of wider prevailing sustainability conditions – environmental, social and economic – to reflect upon the sustainability of the proposal. It also considers the alternative of not introducing Phase 3 of LEZ at all; however, this option is not being consulted upon.

## 3 Setting the context: baseline conditions

### 3.1 Introduction

- 3.1.1 In order to assess the impact of the Variation Order it is first necessary to describe the baseline situation and how it is likely to evolve in the absence of the deferral of LEZ Phase 3 to 2012. (This reflects the approach adopted for the full Integrated Impact Assessment undertaken for the MTS).
- 3.1.2 Phases 1 and 2 of the LEZ scheme are in operation. In the absence of the proposal, Phase 3 would be implemented in 2010 with Phase 4 being implemented in 2012. This, therefore, comprises the baseline situation, hereafter referred to as 'the baseline' or 'Phase 3 2010'.
- 3.1.3 Information presented in this section draws on the impact assessment work undertaken to guide the development of LEZ as a whole, and TfL's Impacts Monitoring Baseline Report<sup>11</sup> and work undertaken for MAQS plus specific updated emissions modelling for this consultation. This has allowed analysis of the baseline and subsequent assessment to focus on those issues which are pertinent to this proposal e.g. changes in emissions and air quality and potential impacts on health and wellbeing. Throughout this section it is noted where information relates to LEZ as a whole or to LEZ Phase 3 specifically (where this information is available).
- 3.1.4 This section begins by presenting the information from which the baseline has been constructed. It then provides an overview of the current baseline conditions in terms of air quality (the primary focus of LEZ). The section then goes on to describe the expected future baseline situation, in the absence of the proposal i.e. if LEZ Phase 3 is introduced in 2010.

### 3.2 Evidence Base: Assessments informing the introduction of LEZ

- 3.2.1 A series of impact assessments were carried out in 2006, as part of the development of the LEZ scheme. These assessments predicted and assessed the anticipated effects of the implementation of LEZ as whole. In July 2008, TfL published an Impacts Monitoring Baseline Report for LEZ. TfL also published the second Travel in London report in 2010. In March 2010 the Mayor published his draft Air Quality Strategy for public and stakeholder consultation, which contains more recent air quality modelling for London as a whole. Taken together these documents provide current air quality baseline information<sup>12</sup>.
- 3.2.2 A full list of assessments and reports drawn on in this baseline review is as follows:

- GLA (2010) Clearing the air: The Mayor's draft Air Quality Strategy for consultation with the public and stakeholders
- TfL (2008) London Low Emission Zone Impacts Monitoring: Baseline Report
- TfL (2010) Travel in London

<sup>11</sup> TfL (July 2008) London Low Emission Zone Impacts Monitoring Baseline Report  
<http://www.tfl.gov.uk/assets/downloads/roadusers/lez/lez-impacts-monitoring-baseline-report-appendix-1.pdf>

<sup>12</sup> *Ibid*

- TfL (2009) Travel in London
- SDG (2006) Proposed London Low Emission Zone Economic and Business Impact Assessment, Final Report
- TRL (2006) Proposed London Low Emission Zone Equality Impact Assessment, Final Report
- AEA Energy and Environment (2006) London Low Emission Zone: Health Impact Assessment, Final Report
- Scott Wilson (2006) Environmental Appraisal of the Proposed London Low Emission Zone

### 3.3 The Baseline

#### Overview

3.3.1 The remainder of this chapter summarises the current characteristics and the predicted trends with LEZ Phase 3 being implemented in 2010 for:

- **Air Quality**
  - PM<sub>10</sub> emissions
  - Compliance with EU limit value for PM<sub>10</sub> in 2011 (if extension granted by European Commission)
  - NO<sub>x</sub> emissions
  - Compliance with EU limit value for NO<sub>2</sub> in 2015 (if extension granted by European Commission)
  - LGV emissions
- **Economic development and population growth**
  - Level of compliance
  - LGV ownership and costs of compliance
  - Minibus ownership and costs of compliance
- **Equality**
  - Health inequalities
  - Economic inequalities
  - Minibus use
- **Health and Wellbeing**
  - Health and wellbeing
- **Safety and security**
  - Road traffic accidents
- **Climate change**
  - CO<sub>2</sub> emissions

- **Physical environment and public realm**

- Biodiversity
- Damage to cultural heritage features

3.3.2 It also identifies the issues emerging from this baseline and trends analysis, which are subsequently addressed in the assessment. Issues are considered in terms of air quality as a whole and for each of the assessment strands.

3.3.3 To understand the future baseline situation, TfL has carried out some air quality modelling. As air quality is affected by many different factors which increase in uncertainty for future year projections (for example construction work, weather, pollutants outside London), modelling analysis has only been carried out as far as 2015. This timeframe ties in with the potential extended deadlines for the EU prescribed limit values (2011 for PM<sub>10</sub> limit values and 2015 for NO<sub>2</sub> limit values).

3.3.4 It should be noted that although the LEZ scheme is aimed at reducing emissions, and there is a relationship between emissions and concentrations, concentrations are affected by a number of other factors (including the weather and pollution from outside London) and so a reduction in emissions will not usually lead to a commensurate reduction in pollutant concentrations. TfL modelling for the original LEZ proposals assessed both concentrations and emissions.

3.3.5 The existing LEZ is predominantly focused on reducing PM<sub>10</sub> emissions. Consequently this is the pollutant that is primarily the focus in the baseline situation and the assessment. However, the specific association between long term exposure to fine particles and mortality effects has also been observed for the PM<sub>2.5</sub> fraction. Emission controls for vehicles under LEZ as a whole will be effective for this size 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>.

3.3.6 The existing LEZ has also reduced emissions more generally, including for NO<sub>x</sub> and CO<sub>2</sub>. This is caused when people replace their vehicle with either a new or compliant second-hand vehicle which have better engine technologies and fuel consumption rates than older vehicles in order to meet the LEZ standards. This will also be the case for LEZ Phase 3.

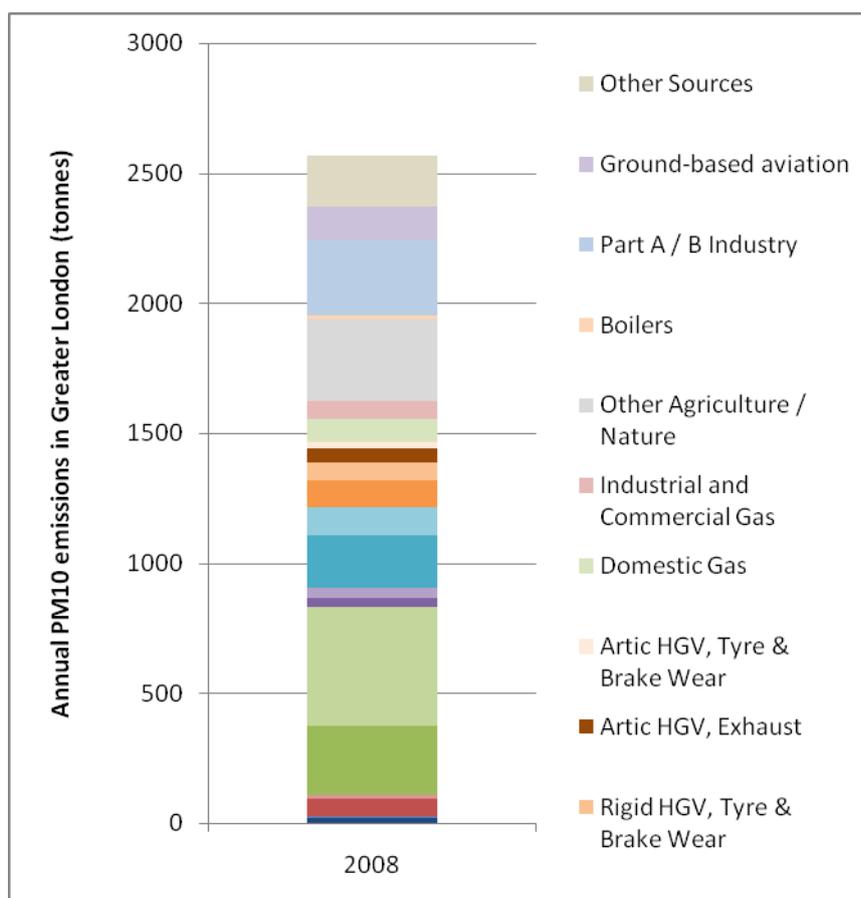
#### Baseline: air quality

##### PM<sub>10</sub> emissions

3.3.7 *Current characteristics:* Road transport is the dominant source of PM<sub>10</sub> emissions in Greater London, contributing around 60% in 2008<sup>13</sup> (about half of which arise from non-exhaust sources such as through tyre and brake wear). Road traffic also causes re-suspension of particles on the road surface, which further contributes to airborne PM<sub>10</sub> levels.

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<sup>13</sup> GLA (2009) Draft Mayor's Air Quality Strategy

**Figure 2: Annual PM<sub>10</sub> emissions in Greater London (tonnes)**

3.3.8 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* LEZ as a whole aims to reduce emissions from diesel-engined vehicles, it targets a major contributor to PM<sub>10</sub> emissions. PM<sub>10</sub> emissions from non-exhaust sources, such as tyre and brake wear are unlikely to be affected by the LEZ scheme<sup>14</sup>. LGV exhaust emissions are estimated to contribute 243 tonnes of PM<sub>10</sub> in 2010 across Greater London. As noted above, the trend with LEZ Phase 3 will be a reduction in PM<sub>10</sub> exhaust emissions from LGVs.

**Table 2: Baseline LGV exhaust emissions (Londonwide) with LEZ Phase 3, assuming an October 2010 Start Date**

TONNES	2008 <sup>15</sup>	2010	2011	2012	2013	2014	2015	Total (2010-2015)
Total PM <sub>10</sub>	279	243	226	203	178	142	102	1094

*Note: numbers are rounded.*

<sup>14</sup> TfL (2008) London Low Emission Zone Impacts Monitoring Baseline Report

<sup>15</sup> 2008 figures are based on the 2008 London Atmospheric Emissions Inventory, which is the most recent data available. 2010, 2011, 2012, 2013, 2014 and 2015 figures are based on modelling undertaken for TfL by ERG. 2009 was not modelled.

- 3.3.9 *Issues identified:* PM<sub>10</sub> emissions from transport make up a significant proportion of all PM<sub>10</sub> emissions. This pollutant needs to be reduced to improve air quality and, therefore, tackling emissions from transport-related activities is a key means to achieve this.

**Compliance with EU limit value for PM<sub>10</sub> in 2011 (if extension granted by European Commission)**

- 3.3.10 *Current characteristics:* A small number of locations focused in central London are currently exceeding the PM<sub>10</sub> daily limit value. These are located on the roads shown in the map below:

**Figure 3: Priority locations (those most at risk of exceeding EU limits for PM<sub>10</sub> in 2010/2011). Source: Mayor's Air Quality Strategy**



- 3.3.11 *Predicted trends (with LEZ phase 3 being introduced in 2010):* TfL analysis suggests that introducing LEZ Phase 3 in 2010 could reduce the number of exceedance days at the priority locations. The number of exceedance days saved varies by location. At Marylebone Road (the location most at risk of exceeding EU limit values for PM<sub>10</sub> in 2011) LEZ Phase 3 introduced in 2010 will save an average of 1.5 exceedance days. (In 2009, 38 exceedance days were reported at Marylebone Road; 35 are allowed).<sup>16</sup>

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<sup>16</sup> Marylebone Road is used here as this is the priority location which is currently monitored (as opposed to modelled). It is also the location at most risk of exceeding EU limit values for PM<sub>10</sub> so gives the best indication of complete compliance with the EU limit values for PM<sub>10</sub>.

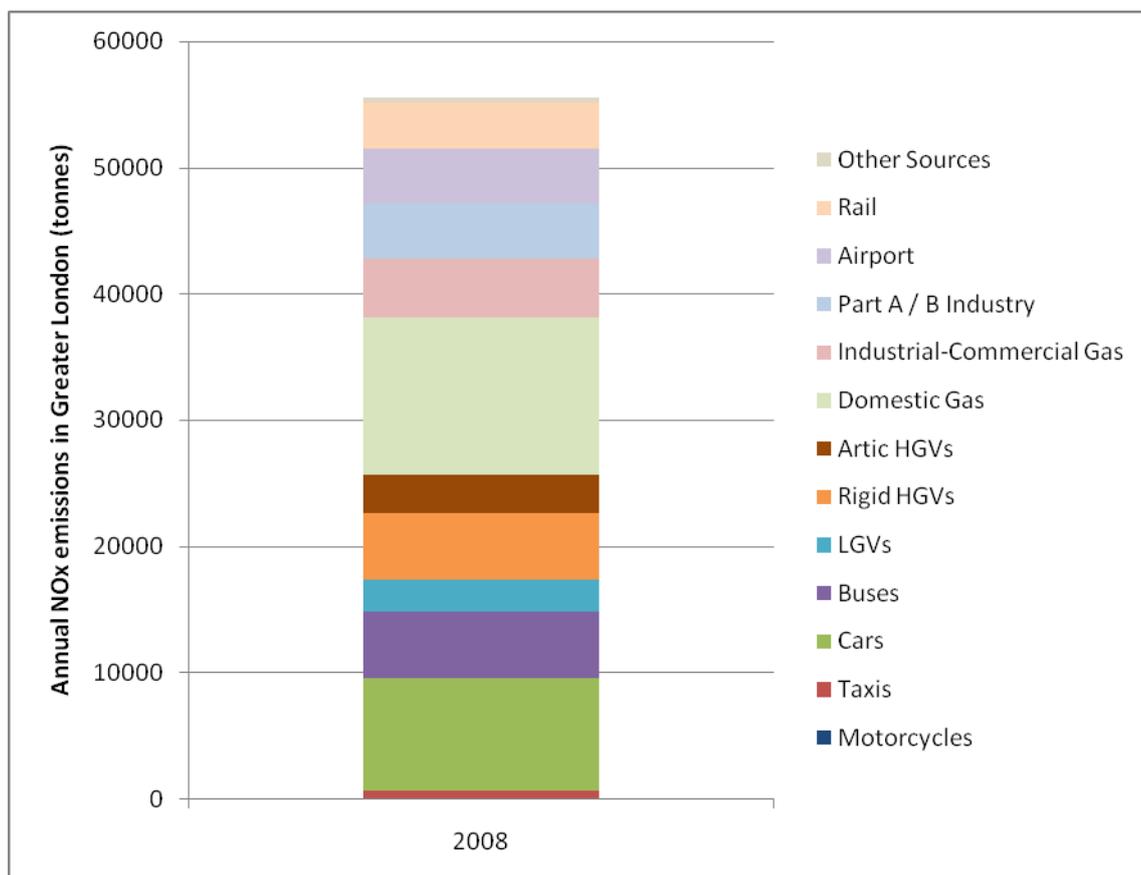
### 3 Setting the context: baseline conditions

3.3.12 *Issues identified:* There are three locations where further action needs to be focused to ensure that EU limit values for PM<sub>10</sub> are met in 2011 and maintained thereafter.

#### NOx emissions

3.3.13 *Current characteristics:* NOx emissions in Greater London are shown in the graph below. Road transport is a significant source of NOx emissions in central London, contributing 46% in 2008<sup>17</sup>.

**Figure 4: Annual NOx emissions in Greater London (tonnes)**



3.3.14 *Predicted trends (with LEZ phase 3 being introduced in 2010):* The trend is for a reduction in NO<sub>x</sub> emissions from LGVs with LEZ Phase 3.

**Table 3: Baseline LGV exhaust emissions (Londonwide) with LEZ Phase 3, assuming an October 2010 Start Date**

TONNES	2008 <sup>18</sup>	2010	2011	2012	2013	2014	2015	Total (2010-2015)
Total NO <sub>x</sub>	3610	2860	2620	2450	2300	2110	1880	14220

*Note: numbers are rounded*

<sup>17</sup> GLA (2010) Draft Mayor's Air Quality Strategy for public and stakeholder consultation

<sup>18</sup> 2008 figures are based on the 2008 London Atmospheric Emissions Inventory, which is the most recent data available. 2010, 2011, 2012, 2013, 2014 and 2015 figures are based on modelling undertaken for TfL by ERG. 2009 was not modelled.

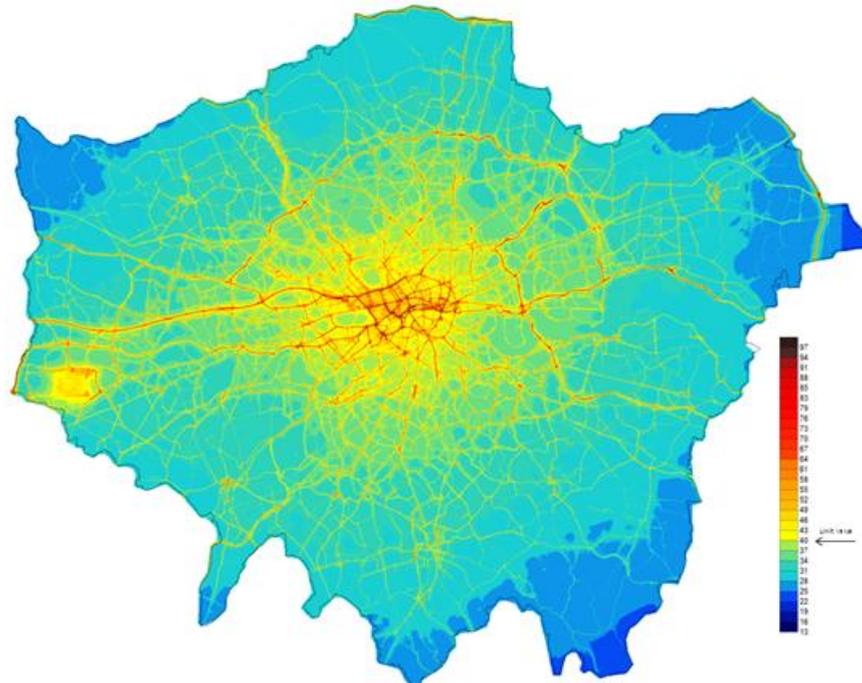
### 3 Setting the context: baseline conditions

- 3.3.15 *Issues identified:* Traffic is a significant source of NO<sub>x</sub> emissions. NO<sub>x</sub> needs to be reduced to improve air quality.

#### Compliance with EU limit value for NO<sub>2</sub> in 2015 (if extension granted by European Commission)

- 3.3.16 *Current characteristics:* Wide areas of Greater London are exceeding the annual mean limit value for NO<sub>2</sub>.

**Figure 5: NO<sub>2</sub> annual mean concentrations (ug/m<sup>3</sup>), 2008**



- 3.3.17 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* The trend is for a reduction in NO<sub>x</sub> emissions. However, TfL modelling, projecting forward to 2015 suggests that the annual mean NO<sub>2</sub> concentrations will still exceed the limit value close to main roads across London without further action<sup>19</sup>.

- 3.3.18 *Issues identified:* Traffic is a significant source of NO<sub>x</sub> emissions, which contribute to high concentrations exceeding EU limit values. NO<sub>x</sub> emissions need to be reduced to improve NO<sub>2</sub> concentrations and help ensure EU limit values are met.

#### Emissions from LGVs

- 3.3.19 *Current characteristics:* In 2006, LGVs travelled 3.9 billion vehicle kilometres in Greater London, representing 12% of the total vehicle kilometres travelled in London. This corresponds to an estimated 21% of total road traffic emissions of PM<sub>10</sub> (12% across all

<sup>19</sup> GLA (2010) Draft Mayor's Air Quality Strategy for public and stakeholder consultation

emission sources in Greater London) and 10% of road traffic emissions of NO<sub>x</sub> (4% across all emission sources in London)<sup>20</sup>.

- 3.3.20 *Predicted trends (with LEZ Phase 3 being introduced in 2010)*: The Revised MTS estimates that the number of LGVs will increase by 30% by 2031<sup>21</sup>. LEZ Phase 3 will help address emissions from LGVs and minibuses. The scale of these reductions in PM<sub>10</sub> and NO<sub>x</sub> is smaller from Phase 3 than from those phases focused on HGVs, buses and coaches.
- 3.3.21 *Issues identified*: LGVs and minibuses contribute to overall PM<sub>10</sub> and NO<sub>x</sub> emissions. Tackling LGV emissions is part of a broader package of measures to reduce emissions from all sources including transport (freight, buses, taxis and cars) and non-transport sources such as domestic and commercial heating.

#### Baseline: economic development and population growth

##### Level of compliance

- 3.3.22 *Current characteristics*: In mid 2009, approximately a quarter of LGVs and minibuses were non-compliant with the LEZ Phase 3 standard<sup>22</sup>. LEZ Phase 3 implementation in 2010 will require these vehicles to become compliant this year, which while it would deliver reductions in emissions, would cause additional strain given current economic conditions.
- 3.3.23 *Predicted trends (with LEZ Phase 3 being introduced in 2010)*: TfL estimates that in 2010, approximately 17% of LGVs and minibuses would be required to take action to meet the new LEZ standards.
- 3.3.24 *Issues identified*: Compliance with LEZ Phase 3 2010 would present a cost to some individuals and businesses. Compliance costs are likely to disproportionately affect smaller businesses with less capacity to absorb such costs, particularly in the current economic context.

##### LGV ownership and costs of compliance

- 3.3.25 *Current characteristics*: Almost half of all vans are privately owned. The majority of LGV operators are in the service sector, rather than in the haulage or freight sector, while the largest single industry sector is construction<sup>23</sup>. TfL estimate that the average expected cost of compliance through retro-fitting for LGVs is estimated as between £1,000 and £2,000 per vehicle (with some specialist equipment costing up to £2,500).
- 3.3.26 *Predicted trends (with LEZ Phase 3 being introduced in 2010)*: Companies with larger fleets tend to have newer vans and are better able to redeploy fleets. As such, LEZ Phase 3 2010 would be unlikely to have a significant impact on larger businesses. The impact on companies and private operators with smaller fleets and older vehicles would be greater, and these operators are estimated to incur the highest LGV unit cost of compliance. However,

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<sup>20</sup> TfL (2008) London Low Emission Zone Impacts Monitoring Baseline Report

<sup>21</sup> TfL (2010) Mayor's Transport Strategy

<sup>22</sup> TfL Analysis

<sup>23</sup> TfL (2008) London Low Emission Zone Impacts Monitoring Baseline Report

there would be some benefits for the vehicles sales and retrofit industry. The trend is for LGVs to be increasingly compliant through natural turnover by 2010, but with greatest cost to operators who own older vehicles.

- 3.3.27 *Issues identified:* As above, financial costs associated with compliance of LGVs are likely to affect smaller businesses proportionately more than larger businesses. Most costs of compliance are likely to be one-off (either through retrofitting or purchasing a newer vehicle).

#### **Minibus ownership and costs of compliance**

- 3.3.28 *Current characteristics:* 'Hire or reward' and the vehicle rental sector account for the largest share of minibus business activity. Due to the high intensity of use and the trend towards contract leasing, vehicles servicing these sectors tend to be younger than the fleet average age (and therefore compliant with the LEZ Phase 3 regulations)<sup>24</sup>. 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<sup>25</sup>. TfL estimate that the average expected cost of compliance through retro-fitting for minibuses could be between £1,400 and £2,500 per vehicle<sup>26</sup>.

- 3.3.29 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* Larger fleet sizes offer options for re-deployment as well as access to resources to invest in upgrading and renewing fleets, therefore the economic impact on smaller businesses operating a minibus is likely to be greatest. A number of community organisations would face the prospect of having to replace or retrofit their non-compliant vehicles sooner than otherwise would be the case. The trend is for commercial minibuses to be compliant for LEZ, with some community organisations facing higher costs to achieve compliance.

- 3.3.30 *Issues identified:* As above, financial costs associated with compliance of minibuses are likely to affect smaller businesses and organisations more than larger businesses. Non-commercial operators of minibuses, including charitable and community organisations are also likely to be disproportionately affected by the costs of compliance. The current economic conditions have also affected charity fundraising and this increased the impact of introducing LEZ in 2010.

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<sup>24</sup> TfL (2008) London Low Emission Zone Impacts Monitoring Baseline Report

<sup>25</sup> TfL (2008) London Low Emission Zone Impacts Monitoring Baseline Report

<sup>26</sup> SDG (2006) Proposed London Low Emission Zone Economic and Business Impact Assessment, Final Report

## Baseline: equality

### Health inequalities

- 3.3.31 *Current characteristics:* Areas experiencing the highest concentrations of PM<sub>10</sub> and NO<sub>2</sub> tend to be those with higher indices of multiple deprivation and higher mortality rates. Black, Asian and minority ethnic people have also been found to experience higher levels of air pollution than the average for the London population<sup>27</sup>. Groups at greater risk from exposure to air pollution include older people, young people, those with asthma, existing cardiovascular or respiratory problems, people over 65, and pregnant women<sup>28</sup>.
- 3.3.32 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* The trend is for improvement in air quality in Greater London as a whole (through LEZ, other TfL measures and natural fleet turnover) which will go towards reducing the inequalities gap in terms of exposure to air pollution.
- 3.3.33 *Issues identified:* Any improvements in air quality across London will help address health inequalities.

### Economic inequalities

- 3.3.34 *Current characteristics:* Information on business ownership suggests that small business owners are more vulnerable to impacts than larger businesses or chains of businesses who can more readily afford the cost<sup>29</sup>.
- 3.3.35 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* Cost of complying with LEZ Phase 3 2010 implementation will have a disproportionate impact on small businesses. This is a consequence both of the greater average age of vehicles in small fleets and the greater vulnerability of small businesses to increased cost, particularly in the current economic context.
- 3.3.36 *Issues identified:* Costs affecting small businesses are likely to have a disproportionate impact on Black and Asian groups and women as these groups work disproportionately in small and medium-sized enterprises (SMEs).

### Minibus use

- 3.3.37 *Current characteristics:* Young people, older people and disabled people have been shown to be more reliant on minibuses for transport than other groups, since this form of transport is more commonly used for youth groups and other community transport schemes. Furthermore, minibuses are often used for employee transport in service sectors where large numbers of ethnic minority workers are employed.

<sup>27</sup> TRL (2006) Proposed London Low Emission Zone Equality Impact Assessment, Final Report

<sup>28</sup> TRL (2006) Proposed London Low Emission Zone Equality Impact Assessment, Final Report

<sup>29</sup> TRL (2006) Proposed London Low Emission Zone Equality Impact Assessment, Final Report

### 3 Setting the context: baseline conditions

- 3.3.38 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* Possible reduction in community services (due to being unable to comply with the scheme), could have implications for health, in terms of physical health (through the provision of healthcare or healthy food), and mental health and wellbeing (such as participating in the community and use of local amenities).
- 3.3.39 *Issues identified:* Increased costs associated with minibus use (from retrofitting, replacement or non-compliance charge) could have a disproportionate impact on equalities groups. The impact is likely to be felt by charitable and community organisations.

#### Baseline: health and wellbeing

##### Health and wellbeing

- 3.3.40 *Current characteristics:* Evidence from a wealth of epidemiological studies demonstrates convincingly that exposure to airborne particles is associated with increased mortality and adverse health effects.
- 3.3.41 *Predicted trends (with LEZ phase 3 being introduced in 2010):* Reducing airborne PM<sub>10</sub> and NO<sub>2</sub> concentrations through the LEZ will bring associated health benefits including lower mortality and reductions in hospital admissions. These benefits will be experienced proportionately more in central London. Reduction in older (and hence noisier) vehicles from the fleet may have a marginal impact in mental wellbeing benefits related to traffic noise.
- 3.3.42 *Issues identified:* Reductions in emissions would lead to reduced air pollutant concentrations with corresponding health benefits.

#### Baseline: safety and security

##### Road traffic accidents

- 3.3.43 *Current characteristics:* In 2006, there were 70 people killed or seriously injured and 550 people slightly injured whilst travelling in goods vehicles, about 2% of the total road traffic casualties<sup>30</sup>. There has been a background trend of reducing road casualties in recent years<sup>31</sup>.
- 3.3.44 *Predicted trends (with LEZ phase 3 being introduced in 2010):* The number of journeys made by vehicles is not expected to change following the implementation of LEZ as a whole, but there is the potential for LEZ as a whole to lead to some marginal improvements in road safety through the procurement of newer vehicles with better road safety performance features. The expectation is for the current trend of reducing road casualties to be unaffected by the implementation of LEZ Phase 3.

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<sup>30</sup> TfL (2007) Travel in London Report

<sup>31</sup> TfL (2009) Travel in London

### 3 Setting the context: baseline conditions

- 3.3.45 *Issues identified:* Some procurement of newer vehicles may lead to some small improvements in road safety though other factors also impinge upon this.

#### Baseline: climate change

##### CO<sub>2</sub> emissions

- 3.3.46 *Current characteristics:* From the 2006 London Atmospheric Emissions Inventory, it was estimated that LGVs accounted for around 10% of road traffic emissions of CO<sub>2</sub> and 3% of total CO<sub>2</sub> emissions in London<sup>32</sup>.
- 3.3.47 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* The purchasing of newer, more fuel-efficient vehicles in order to achieve compliance with LEZ Phase 3 in 2010 will lead to benefits in terms of reducing CO<sub>2</sub> emissions equivalent to 30,000 tonnes over a six year period between 2010 and 2015. However the relative impact of this is expected to be very small (less than 1% change in LGV CO<sub>2</sub> emissions). Retrofitting of vehicles has a negligible effect in terms of CO<sub>2</sub> emissions as no significant changes in fuel consumption are expected.
- 3.3.48 *Issues identified:* Reducing CO<sub>2</sub> emissions from traffic will reduce the impact on climate change. The extent of such reductions is limited, however.

#### The physical environment and public realm

##### Biodiversity

- 3.3.49 *Current characteristics:* The majority of the natural vegetation within the Greater London area is under some kind of environmental stress as a result of air pollution (in particular NO<sub>x</sub>)<sup>33</sup>.
- 3.3.50 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* The trend is for a reduction in emissions of NO<sub>x</sub> and PM through the collective delivery of all phases of LEZ, which has the potential to have a small beneficial effect on biodiversity within London.
- 3.3.51 *Issues identified:* Improvements in air quality will have a small benefit for London's biodiversity.

##### Damage to cultural heritage and features

- 3.3.52 *Current characteristics:* London possesses a rich cultural heritage with four World Heritage Sites, and 73,000 sites, artefacts and Listed Buildings listed in the Greater London Sites and Monuments Record<sup>34</sup>.

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<sup>32</sup> TfL (2008) London Low Emission Zone Impacts Monitoring Baseline Report

<sup>33</sup> Scott Wilson (2006) Environmental Appraisal of the Proposed London Low Emission Zone

<sup>34</sup> Scott Wilson (2006) Environmental Appraisal of the Proposed London Low Emission Zone

### 3 Setting the context: baseline conditions

- 3.3.53 *Predicted trends (with LEZ Phase 3 being introduced in 2010):* With LEZ as a whole, the trend is to reduce emissions of PM which will have a beneficial effect of reducing the soiling and decay, due to dry deposition, of cultural heritage assets in London.
- 3.3.54 *Issues identified:* Improvements in air quality will have a limited benefit for London's cultural heritage features.

#### **Summary of characteristics of the baseline: with LEZ Phase 3 being introduced in 2010**

- 3.3.55 The baseline is the situation with LEZ Phase 3 being introduced in 2010. The data indicates that Phase 3 would make a positive contribution to the reduction in PM<sub>10</sub> and NO<sub>x</sub> emissions.
- 3.3.56 The reduction of emissions arising from implementation of LEZ Phase 3 in 2010 is expected to have health benefits, in particular, with respect to respiratory and cardiovascular health. The baseline indicates that there is some evidence to suggest that such benefits would be particularly felt by certain equalities groups, in particular, those suffering socio-economic deprivation. The trend would, therefore, be of a slight improvement in health status.
- 3.3.57 PM<sub>10</sub> and NO<sub>x</sub> emissions arising from vehicular activity are anticipated to decline through cleaner technology and fuel and improved standards of fuel efficiency in vehicles brought about by the imposition of Euro standards. With respect to the contribution that LEZ as a whole makes, the trend is expected to be one of bringing forward emissions reductions including through tackling the contribution which LGVs make.
- 3.3.58 The magnitude of any benefit predicted to accrue in respect of baseline conditions through the specific implementation of LEZ Phase 3 in 2010, (and for the subsequent two years to 2012) has not been formally estimated in any previous impact assessment. Instead all four of the initially proposed phases of LEZ were analysed as a single package. For this assessment disaggregated figures for the third phase of LEZ are available. However, as these are disaggregated and have been calculated on the basis of the latest emissions factors (the 2008 London Atmospheric Emissions Inventory) and refined assumptions about potential operator responses to the new LEZ standard, they are not comparable with the previous work on LEZ as a whole.
- 3.3.59 It should be noted that the benefit in 2010-2011 would be larger than for any similar period in the future, as the number of vehicles affected would be greatest. This is because the population of LGVs and minibuses not compliant with the Euro III emission standard will decline naturally with time due to background fleet turnover.
- 3.3.60 The baseline in respect of economic factors suggests this is a less opportune time in the economic cycle than others for the imposition of additional costs.
- 3.3.61 Business conditions in London are likely to remain difficult for the next year or so. Factors highlighted by GLA Economics analysis, note that there is a range of reasons making it likely that there will only be a slow recovery initially after the recession comes to an end. These include the recognition that confidence in the economy remains weak and a significant fiscal retrenchment is required to bring the UK's public finances back to a sustainable long-term position. Other factors include the availability of credit to households and firms, which is still limited and the need for financial institutions to strengthen their balance sheets further.

### 3 Setting the context: baseline conditions

#### 3.4 Consideration of the Baseline

- 3.4.1 There are obvious key challenges within environmental, social and economic baseline conditions to be considered when seeking to understand how conditions will evolve in the absence of the proposal. These issues are pertinent to the context within which the proposal and its alternatives are assessed and are explored further in the narrative of the assessment in Section 5.

## 4 Other air quality measures already planned

- 4.1.1 The proposed introduction of LEZ Phase 3 in 2012 is part of a broader package of measures included in the draft MAQS and the revised MTS. Consequently, any impacts need to be understood in this broader context.
- 4.1.2 Overall, implementation of the policies and proposals in the draft MAQS, along with natural fleet turnover, is expected to reduce PM<sub>10</sub> emissions from all sources in central London by around 13% by 2011 (compared with 2008). Based on modelling for the draft MAQS, including LEZ Phase 3 and implementation of targeted local measures, the Mayor is confident that London will meet the EU limit value for PM<sub>10</sub> in 2011.
- 4.1.3 Through its Business Plan, Transport for London is already committed to spending billions of pounds on transport measures that will directly or indirectly help reduce emissions of PM and NOx. Measures already proposed or underway include:
- Promoting mode shift to cleaner forms of transport, including ongoing investments in public transport through schemes including Crossrail and the tube upgrades and significant increases in cycling and walking infrastructure, including Cycle Hire in central London and twelve Cycle Superhighways.
  - Bus emissions programme – from 2012 every new bus coming into the London fleet will be diesel-electric hybrid and the New Bus for London is expected to be hybrid.
  - Improving road maintenance to reduce the contribution of PM to emissions from road surface wear.
  - Smoothing traffic through better traffic management and street works coordination through measures including the London Permit Scheme.
  - Making it easier for boroughs to implement and enforce 20mph zones.
  - The continuation of the original zone of the Central London Congestion Charging scheme which reduces traffic congestion and associated emissions and helps promotes mode shift.
  - The continued operation of the London Low Emission Zone, which reduces emissions from older, heavier diesel vehicles.
  - Procurement and promotion of electric vehicles – the Mayor has a target of getting 100,000 electric vehicles on London's roads as soon as possible.
  - 'Greening' of transport fleets – for example, phased replacement for Dial-a-Ride vehicles and 1,000 electric vehicles in the GLA fleet by 2015.
  - Freight Delivery and Service Plans – being implemented and promoted by TfL to reduce unnecessary freight mileage and increase freight efficiency.

4.1.4 The draft MAQS includes a number of other measures to reduce emissions across London that will contribute to meeting the 2011 EU limit value for PM<sub>10</sub> and deliver health benefits for Londoners. These measures will help mitigate air quality benefits lost by deferring the extension of the LEZ to LGVs and minibuses from 2010 to 2012:

- The use of focused local measures at those locations in central London most at risk of exceeding the EU limit values for PM<sub>10</sub> in 2011 will deliver a very targeted benefit. These will include power washing roads and applying dust suppressants, focusing more hybrid buses on routes going through these locations and better enforcement of existing no-idling and no-stopping rules.
- Further eco-driving schemes, including training for bus, taxi and GLA/ functional body drivers and supporting training for the public.
- Further measures to encourage a shift to cycling and walking, including awareness raising campaigns and Biking Boroughs.
- Rolling out smarter travel schemes and initiatives.
- Implementing the London Hydrogen Transport Plan, which will see five hydrogen fuel cell buses join the fleet in 2010.
- Further measures to encourage electric vehicles, including working with car rental firms.
- Enhancing on-street infrastructure to support car clubs, especially those using electric or hybrid vehicles.
- Establishing a London no-idling zone, particularly focusing on improving enforcement.
- Review and full implementation of construction and demolition Best Practice Guidance to reduce dust emissions from building sites.
- Tighter standards for new biomass boilers.

4.1.5 There are also a number of additional measures included in the MAQS that will not take effect until 2012 or after but will further contribute to improving air quality in London:

- Age based limits for taxis and private hire vehicles, to remove the oldest, most polluting vehicles from the roads.
- Introducing a requirement for all new private hire vehicles entering the fleet to meet a minimum Euro 4 standard for PM emissions from 2012.
- Encouraging low emission private hire vehicles through variable or reduced licence fees.
- Better use of the planning system to reduce emissions from new developments and incorporating air quality measures into planned urban realm improvements. (Note: this is already happening to some extent and this proposal is to increase the role of the planning system in delivering air quality benefits; however, the majority of the air quality benefit is not expected to be felt until after 2012).

#### 4 Other air quality measures already planned

- Introducing a new NO<sub>x</sub> LEZ standard for HGVs, buses and coaches from 2015.
- A longer-term commitment to develop a zero emission taxi by 2020 and 60% more fuel efficient than today by 2015.

4.1.6 In terms of off-setting any potential impacts of deferring LEZ Phase 3, the proposed local measures 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% 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.

# 5 Assessment findings

## 5.1 Introduction

- 5.1.1 This chapter summarises the assessment findings of the proposal to defer the introduction of Phase 3 of LEZ from 2010 to 2012, taking into account the baseline conditions and trends identified in chapter 3 and noting the extent to which the proposal would give rise to effects and whether these are significant.
- 5.1.2 When assessing the impacts forecast to arise from the proposal to defer the implementation of Phase 3 from 2010 to 2012, the assessment took due account of the specific nature of Phase 3. The deferral of LEZ Phase 3 is assessed in the context of the contribution which the scheme would make to improving air quality within London and the wider impacts of this in social, economic and environmental terms.
- 5.1.3 This assessment has also taken into account the wider package of measures proposed (referred to in chapter 4 of this document) currently included in the revised MTS and the draft MAQS which form the wider policy context within which the proposed deferment of Phase 3 would be implemented. This policy context would be likely to bear on the scale or severity of its potential impact.
- 5.1.4 The assessment has identified, where possible, quantifiable data specific to Phase 3. The identification of impacts has, however, more broadly relied on qualitative data to determine the relative significance and severity or scale of impacts. The impacts identified have, therefore, been arrived at by the exercise of judgement, where quantification has not been possible and/or where a determination of the relative impact of Phase 3 has been required.

## 5.2 Alternatives considered throughout this assessment

- 5.2.1 This is an assessment of a proposal to defer a stage of the LEZ that has not yet been introduced but is included in the Greater London Low Emission Zone Charging Order. The assessment includes consideration of:
- The baseline: Retaining the introduction of Phase 3 of LEZ in 2010 as proposed in the MTS 2006 and the operation of the LEZ scheme;
  - The proposal: to defer the implementation of Phase 3 of LEZ from 2010 to 2012; and
  - An alternative option: not introducing Phase 3 at any point, in 2010, 2012 or any subsequent date (although this is not being consulted upon).
- 5.2.2 These are assessed, as appropriate, within the context of the emerging policies and proposals within the revised MTS and draft MAQS so far as they would be likely to affect their respective likely significant impacts.
- 5.2.3 However, it should be noted that introducing the scheme in 2010 is no longer feasible given the lack of time to make necessary operational arrangements and the expectations that operators have about when they need to take action. It is also important to note that now that MTS has been confirmed, a 'do not introduce LEZ Phase 3 at all' option could only be implemented if the MTS (and the draft MAQS) were to be amended.

### 5.3 Deferred and differing level of impact

5.3.1 With respect to what Phase 3 seeks to achieve, there are two key elements for consideration in the assessment, namely:

- **When the impact of Phase 3 will materialise:** deferment will see Phase 3 introduced at the beginning of 2012 (as opposed to October 2010). The impacts of the deferment are largely temporal compliance impacts deferred from 2010 to 2012<sup>35</sup> (with pre-compliance in 2011 rather than 2009).
- **What the net impact will be in terms of the objectives of Phase 3:** while most of the benefits of Phase 3 will still be achieved, albeit a little later, TfL estimates that deferment of Phase 3 from 2010 to 2012 will mean some loss of emissions reduction benefits, to the extent of around 10% for PM<sub>10</sub> and around 20% for NOx. In terms of wider impacts, compliance costs in 2011/2012 are expected to be considerably lower than they would have been in 2009/10 because of the natural turnover of vehicles.

5.3.2 The deferment of Phase 3 is, therefore, assessed in terms of these two factors and the environmental, social and economic impacts to which these are predicted to give rise.

### 5.4 Assessment: recognising the element of uncertainty

5.4.1 The assessment has used analysis undertaken by TfL to understand the potential impacts of this proposal and to establish what wider measures are required to mitigate against any predicted adverse impacts of the deferral of LEZ Phase 3.

5.4.2 It is important to note, however, that TfL's analysis of estimates is based on current available information. It is not possible to quantify with precision future impacts given that there are many variables involved and the future effect of wider measures within the Revised MTS are not precisely known. Nevertheless, despite these uncertainties it is considered that the assessment is robust and provides as accurate a prediction of likely significant impacts as can be produced with current knowledge.

### 5.5 Assessment Framework

5.5.1 The initial version of this Impact Assessment used the Assessment Framework developed for analysis of the Draft Revised MTS.

5.5.2 To aid clarity, this update has focused on key aspects where significant impacts have been identified or further changes have taken place since the original assessment. Given the impacts of the proposal on emissions and compliance with EU limit values it has also been necessary to include a new category examining these impacts.

5.5.3 The updated Impact Assessment has assessed the proposal against the following categories:

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<sup>35</sup> TfL's published LEZ impacts monitoring report confirms that during the year before Phases 1 and 2 of the LEZ were implemented (2007), 'operator pre compliance' with the requirements of the scheme had already delivered about half of the changes to vehicles and emissions that TfL expected in 2008. Similar pre-compliance benefits for LEZ Phase 3 as experienced for LEZ Phases 1 and 2 could be expected.

5 Assessment findings

To contribute to a reduction in air pollutant emissions and compliance with EU limit values
To contribute to London's economic competitiveness
To enhance equality and social activity
To contribute to enhanced health and wellbeing for all within London
To contribute to the mitigation of and adaptation to climatic change

5.5.4 The following have **not** been re-examined:

To promote safety and security for all working, travelling and using London transport services and facilities
To protect and enhance the physical, historic, archaeological and socio-cultural environment and public realm

5.5.5 A scoring system, accordingly, has been used to identify the nature and the magnitude of the predicted impacts of the proposal in respect of each of the key aspects of sustainability, as follows:

Nature and Magnitude of Significant Impact	Colour and Assessment Code	Description of Impact
Strong positive	✓✓	A <b>positive</b> impact of <b>moderate to major</b> magnitude.
Positive	✓	A <b>positive</b> impact of <b>minor to moderate</b> magnitude.
Neutral	---	An impact where <b>no</b> change from the current situation is expected.
Uncertain	?	Where uncertainty exists as to the overall impact – or – there are both positive and negative impacts
Negative	X	A <b>negative/adverse</b> impact of <b>minor to moderate</b> magnitude.
Strong negative	X X	A <b>negative/adverse</b> impact of <b>moderate to major</b> magnitude.

5.5.6 The summary of the assessment findings is shown below against the IIA Assessment Framework building on the assessment undertaken for MTS. The assessment score (colour and coding) reflects how the proposal (deferral of Phase 3 until 2012) performs against the

baseline option of retaining the introduction of Phase 3 in 2010. Commentary is also made in the assessment narrative on how the proposal performs against an option (for the purposes of the assessment) of not introducing Phase 3 at all.

**5.6 Assessment of Deferring the Implementation of Phase 3 of the Low Emission Zone from 2010 to 2012**

A – To contribute to a reduction in air pollutant emissions and compliance with EU limit values	
A1. To contribute to improving London’s air quality (an overview)	X

***The proposal (defer LEZ Phase 3 from 2010 to 2012)***

- 5.6.1 Implementation of the proposal would result in a deferment of reductions in emissions – either in pre-compliance or compliance terms and a slight decrease in the aggregate reduction of emissions delivered through Phase 3 as a whole – relative to the introduction of Phase 3 in 2010.
- 5.6.2 This has some potential implications in the context of the current non-compliance of parts of London with EU daily mean PM<sub>10</sub> limit value for 2011 which are addressed below (see A4). However, as LEZ Phase 3 has similar benefits in 2011 regardless of whether it is implemented in October 2010 or January 2012 this impact is limited. Similar benefits can be expected due to pre-compliance benefits in 2011 for the 2012 launch. The earlier month of implementation (i.e. January) means those pre-compliance benefits fall fully in the previous calendar year.
- 5.6.3 Relative to the option of introducing Phase 3 in 2010, the proposal therefore weakens the effectiveness of the LEZ’s contribution to air quality improvement in the period 2009-2010 and has, accordingly, an **adverse** effect on air quality.
- 5.6.4 Given the limited timeframe of such deferment and the role which natural vehicle replacement will continue to have in promoting reductions in emissions of air quality pollutants over the deferral period, while the impact of the proposal is assessed to be adverse relative to the option of retaining Phase 3 introduction in 2010, it is assessed to be **minor** in magnitude.
- 5.6.5 The severity or scale of this potential negative impact for London’s air quality could be offset by the wider suite of policies and proposals in the revised MTS and the draft MAQS, which will have a positive impact in reducing emissions to air. Targeted local measures would play a particularly important role at the priority locations.

***The alternative option (no LEZ Phase 3)***

- 5.6.6 Were LEZ Phase 3 not to be implemented at all the impact on air quality would be more adverse and of a greater magnitude.
- 5.6.7 Although the LEZ by itself can never deliver the air quality improvements required to achieve universal compliance with air quality standards, it is an important part of the overall solution. Pre-compliance in 2011 from the deferred LEZ Phase 3 is an important element of the

## 5 Assessment findings

package of measures contained with the Mayor's draft Air Quality Strategy to ensure London complies with EU limit values (see A4).

5.6.8 Relative to not introducing Phase 3 at all, the proposal is beneficial.

### Notes

5.6.9 Emissions calculations for NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> for the LEZ Phase 3 deferral do not include potential additional reductions in emissions due to vehicles that may no longer come into the LEZ and the associated reduction in vehicle kilometres within the LEZ. Emissions calculations have assumed no reduction in vehicle kilometres as the locations of these routes are highly variable. While some compliant operators are likely to combine some of the lost vehicle kilometres within their own existing trips, there could still be additional reductions in emissions.

5.6.10 Smaller particles including PM<sub>2.5</sub> are associated with respiratory and cardiovascular health impacts, whilst particles from road transports, including black carbon may have an important role in climate change through their ability to trap heat in urban environments. Beyond the quantification of emissions reductions within this IIA, other air quality benefits shown through air pollution monitoring data indicate reductions in the amount of black carbon and PM<sub>2.5</sub> as a result of earlier phases of the LEZ which have reduced exhaust emissions of these pollutants.

A2. To contribute to a reduction in PM <sub>10</sub> emissions	X
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**Table 4: Impact of deferring LEZ Phase 3 on LGV PM<sub>10</sub> exhaust emissions (Londonwide)**

PM <sub>10</sub> TONNES		2010	2011	2012	2013	2014	2015	Total
October 2010 start	Total LGV emissions	243	226	203	178	142	102	1094
	Emission savings	44	33	16	5	-1	-6	91
January 2012 start	Total LGV emissions	287	227	191	168	134	96	1103
	Emission savings	0	32	28	15	6	0	81
Difference in emission savings between 2010 start and 2012 start		-44	-1	12	10	7	6	-10

Note: numbers are rounded.

### The proposal (defer LEZ Phase 3 from 2010 to 2012)

5.6.11 Based on the latest emissions factors available for LGVs, launching the LEZ Phase 3 in October 2010 could have been expected to reduce LGV PM<sub>10</sub> emissions by around 44 tonnes in that year.

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- 5.6.12 Deferring the LGV and minibuses phase of LEZ to January 2012 would mean that the benefits in 2010 would be lost. However, in 2011 due to expected pre-compliance similar emissions reductions could be expected as for a 2010 start. In 2012, 2013, 2014 and 2015 the benefits would be higher due to the diminishing returns from a scheme launched in October 2010 (for both schemes the biggest benefit will be in the early years of operation).
- 5.6.13 In total, introducing LEZ Phase 3 in 2010 is expected to save around 90 tonnes of PM<sub>10</sub> (over a six year period from 2010 to 2015 compared to a 'do nothing' scenario). Introducing it in 2012 reduces the benefits by around 10%, but will still save around 80 tonnes of PM<sub>10</sub> (also over the same period from 2010 to 2015).
- 5.6.14 Consequently the deferral of LEZ Phase 3 has a **negative** impact but **minor** in magnitude, as the reductions delivered by LEZ Phase 3 are relatively small compared to London's PM<sub>10</sub> emissions as a whole. Deferring LEZ Phase 3 to 2012 would result in a smaller but still beneficial impact on emissions.

### *The alternative option (no LEZ Phase 3)*

- 5.6.15 Not introducing LEZ Phase 3 at all means that potential emission savings outlined above are all lost. This would have negative impacts on reducing the emissions in London from this source and the achievement of EU limit values for PM<sub>10</sub> (see A4).

A3. To contribute to a reduction in NOx emissions	X
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### *The proposal (defer LEZ Phase 3 from 2010 to 2012)*

**Figure 6: Impact of deferring LEZ Phase 3 on LGV NOx emissions (Londonwide)**

NOx TONNES		2010	2011	2012	2013	2014	2015	Total
October 2010 start	Total LGV emissions	2860	2620	2450	2300	2110	1880	14,210
	Emission savings	530	440	280	180	100	50	1570
January 2012 start	Total LGV emissions	3390	2680	2360	2220	2050	1860	14,550
	Emission savings	0	390	380	260	150	70	1240
Difference in emission savings between 2010 start and 2012 start		-530	-60	90	77	50	20	-340

*Note: numbers are rounded.*

- 5.6.16 The LGV and minibuses phase of LEZ is focused on delivering PM<sub>10</sub> benefits by introducing a new PM standard for LGVs and minibuses. However, as some operators will replace their vehicles rather than simply retrofit them it is also expected to deliver NOx benefits. In total introducing the LGV and minibuses phase in 2010 is expected to save around 1570 tonnes of NOx (over a six year period from 2010 to 2015). Introducing it in 2012, meanwhile, will save around 1240 tonnes of NOx, a reduction of saved emissions of around 20%.

***The alternative option (no LEZ Phase 3)***

- 5.6.17 Not introducing LEZ Phase 3 at all means that potential emission savings are lost. This would have negative impacts on reducing the emissions in London from this source and the achievement of EU limit values for NO<sub>x</sub> (see A4). 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>.

A4. To contribute to London complying with EU limit values	X
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***The proposal (defer LEZ Phase 3 from 2010 to 2012)***

- 5.6.18 The Mayor is legally required under the GLA Act to provide policies and proposals to meet national regulations which transpose the EU limit values for PM<sub>10</sub> by 2011 and NO<sub>2</sub> for 2015. Failure to meet the EU limit values will result in infraction proceedings which could lead to a significant fine for national government.

*PM<sub>10</sub>*

- 5.6.19 Analysis undertaken by TfL shows that London is close to meeting the EU limit values for PM<sub>10</sub>; only a small number of central London locations are expected to remain at risk of exceeding the daily limit value in 2011. The draft Air Quality Strategy sets out a range of measures to deliver emissions reductions, including local action to address these specific locations (see section 4 for a complete summary).
- 5.6.20 TfL modelling has shown that expected improvement in the vehicle fleet (through natural turnover) combined with the measures set out in the draft MAQS are expected to result in London meeting the EU limit values for PM<sub>10</sub> in 2011. LEZ Phase 3 (launching in 2012) is included in this modelling and gives greater certainty that London will meet the EU limit value for PM<sub>10</sub> in 2011.
- 5.6.21 As noted above, TfL analysis suggests that introducing LEZ Phase 3 in 2010 could reduce the number of exceedance days at the priority locations in 2010 and 2011. The number of exceedance days saved varies by location. At Marylebone Road (the location most at risk of exceeding EU limit values for PM<sub>10</sub> in 2011) LEZ Phase 3 introduced in 2010 will save an average of 1.5 exceedance days. 35 exceedance days are permitted at any given location, so one day is notable given that only a small number of exceedance days need to be removed to make the priority locations compliant.
- 5.6.22 The introduction of LEZ Phase 3 in January 2012 would save an average of 1.5 exceedance days at Marylebone Road in 2011. Deferring LEZ Phase 3 to 2012 will not have a notable impact on the number of 'exceedance days saved' at the priority locations in 2011. The draft MAQS shows that London will meet EU limit values for PM<sub>10</sub> by 2011, on the basis of a package of measures including the implementation of LEZ Phase 3 in 2012.
- 5.6.23 In this context the contribution made by reducing emissions from LGVs and minibuses is an important and significant matter, increasing the margin of comfort that the EU limit values will be met. In this context, deferring has a **negative** impact on the achievement of EU limit

values but as there will still be pre-compliance benefits in 2011 from deferring LEZ Phase 3 to 2012 it will be **minor** in magnitude.

*NO<sub>2</sub>*

5.6.24 Assuming an extension is given, the date for achieving EU limit values for NO<sub>2</sub> will be 2015. Whilst LEZ Phase 3 is targeted at PM<sub>10</sub> emissions, where newer vehicles replace older ones NOx benefits are also provided by the scheme which complement other proposals set out by the Mayor. These proposals include a taxi strategy, a new NOx standard for HGVs, buses and coaches as part of LEZ from 2015, to address NOx emissions. Together with LEZ Phase 3 these play an important role in improving air quality in London, including reducing concentrations of NO<sub>2</sub> helping towards meeting relevant EU limit values.

***The alternative option (no LEZ Phase 3)***

5.6.25 Defra has undertaken modelling of London’s air quality in 2011 to inform its submission to the European Commission for an extension to the PM<sub>10</sub> EU limit value deadline from 2005 to 2011. Their modelling only included current measures (e.g. the two initial phases of the Low Emission Zone affecting HGVs, buses and coaches; some hybrid buses etc) as well as natural turnover and national measures. Defra’s modelling showed that even without taking further action (i.e. not implementing LEZ Phase 3) London should be compliant with EU limit values by 2011. However, there was no margin of safety. This is a significant 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.

5.6.26 Consequently, not introducing LEZ Phase 3 at all would reduce the certainty of the EU limit values for PM<sub>10</sub> being met in 2011.

5.6.27 For NOx, not introducing LEZ Phase 3 at all will mean that there are no NOx savings to contribute towards the 2015 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 NOx.

<b>B – To contribute to London’s economic competitiveness</b>	
B1. Supporting economic competitiveness by minimising business costs	✓

***The proposal (defer LEZ Phase 3 from 2010 to 2012)***

5.6.28 Analysis of the potential impacts which are likely to occur following the introduction of LEZ Phase 3 in 2010 indicated that the scheme could create disbenefit for both individuals and local and small businesses, these disbenefits primarily comprising (particularly in context of the economic situation):

- costs of purchasing before 2010 new or used compliant vehicles, or costs of retrofitting and upgrading existing vehicles;

- the proposed daily LEZ charge, evasion penalty charge and the probability of evaders getting caught; and
- direct and indirect costs to businesses of potential business relocation, changed distribution patterns and restricted access.

*Compliance costs*

5.6.29 Operators of non-compliant LGVs, minibuses and other affected vehicles will be impacted by including LGVs and minibuses in the scope of the Low Emission Zone. Operators have a number of options, with varying cost implications, in order to meet the requirements of the scheme. They could:

- Replace their non-compliant vehicle with a new compliant one
- Replace their non-compliant vehicle with a second-hand compliant one
- Retrofit their vehicle with abatement equipment
- Re-engine their vehicle
- Ignore the scheme and not enter the zone
- Ignore the scheme and enter the zone risking a fine
- Pay the charge

5.6.30 The compliance costs to operators shown below reflect the net impact once costs which would have been incurred regardless of introducing the scheme have been removed. The costs of these various compliance alternatives relate to industry outlays of between £40,000 to £70,000 per year 'standing and running' costs of operating a commercial light goods vehicle.

5.6.31 A key consideration is the current economic situation. This is set out in full in chapter 2 where the rationale for the proposal is explained. In summary, the severe recession and restriction in credit from 2008 onwards meant that the impacts of LEZ Phase 3 would be greater than was originally anticipated when the original decision was made to implement the scheme in a period of economic growth.

5.6.32 Nevertheless, for individual businesses pre-compliance options remained despite the recession. Constrained financial liquidity was partially offset by motor manufacturers and dealers heavily discounting new vehicle list prices. Additionally, in May 2009 the Government, in collaboration with motor manufacturers, offered a scrappage scheme with up to £2000 trade-in value on vehicles over 10 years old, including non-compliant vehicles covered by LEZ Phase 3. Operators would also be able to purchase compliant second hand vehicles at considerably lower cost than a new vehicle. For many small operators 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), remains an economical way to compliance for higher value vehicles).

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- 5.6.33 Using the data above, TfL has estimated that in 2010 around 90,000 vehicles would not have been compliant with the new LEZ standards for LGVs and minibuses. By 2012 this figure is expected to have fallen to around 70,000 vehicles.
- 5.6.34 The total compliance costs for these vehicles depend on the replacement choice made by operators. The breakdown of choices has been estimated by TfL but due to the current economic uncertainty is only approximate. Consequently a wide range is given in order to reflect the variety of potential responses by operators.
- 5.6.35 On this basis, in 2010 compliance costs for operators were expected to be in the region of £115-130m. In 2012 this is expected to fall to between £85m-£100m, resulting in an approximate reduction in compliance costs of around £30m.
- 5.6.36 While the overall provision of goods and services within London's economy is not expected to be affected by LEZ Phase 3 (i.e. journeys which can no longer be undertaken by non-compliant LGVs are expected to be undertaken by compliant vehicles instead) there may be some individual impacts if individuals are deterred from work in London because they have a non-compliant vehicle. While these are micro-impacts, they are significant to those affected by them. As for compliance costs, deferral will be beneficial for these individuals as they will have a longer period of time before they are affected by the introduction of new LEZ standards.
- 5.6.37 Non-compliant minibuses are more likely to be operated by schools, charities and community organisations, with associated limits on their resources. Charities in particular have been strongly affected by the recession as there has been a significant reduction in voluntary giving and the availability of grants from awarding bodies. The impact of introducing the LGV and minibuses phase of LEZ during the recession on these organisations would have been more significant (see section C1).
- 5.6.38 During constrained economic conditions business activity suffered and postponing extending LEZ to include LGVs and minibuses offers significant help to operators. Some would fall out of the scope of the LEZ due to natural replacement, others would have additional time to comply and benefit from reduced costs. The deferral of this phase of LEZ, therefore, has a **positive** impact on small business and other operators of non-compliant vehicles of **moderate** magnitude.

### ***The alternative option (no LEZ Phase 3)***

- 5.6.39 Not introducing LEZ Phase 3 would mean that small businesses and other operators of non-compliant would not face compliance costs, resulting in a larger positive impact for businesses and organisations directly affected.

<b>C – To enhance equality and social activity</b>	
C1. To address barriers to equality	✓
C2. To support social activity	

***The proposal (defer LEZ Phase 3 from 2010 to 2012)***

- 5.6.40 Relative to the option of introducing Phase 3 in 2010, the proposal is predicted to have a positive economic impact during the deferral period on those people who use large vans and minibuses, many of the latter being owned and operated by community groups such as schools and charities which contribute to London's rich educational, cultural, heritage and sporting life. Some will have been especially adapted (e.g. to make them wheelchair accessible) at additional cost and may not be easy to retrofit due to their age.
- 5.6.41 In addition, the Equalities Impact Assessment undertaken to guide the development of the scheme, identified that young people, older people and disabled people were seen to be more reliant on minibuses for transport. Charities, schools and similar bodies are likely to be smaller organisations, less able to absorb additional costs to meet the new LEZ standards. This situation would have been exacerbated by the recent recession which has affected charitable giving and the availability of grants from funding organisations.
- 5.6.42 The proposal would therefore have a positive impact on these groups of people, relative to implementing the Scheme in 2010.
- 5.6.43 Motorcaravans are also included in the scope of LEZ Phase 3. A very small number of these are used by people with disabilities. The impact of the introduction of LEZ Phase 3 may be significant for these few individuals.
- 5.6.44 With greater time for community groups to accommodate the additional cost, the predicted impact with respect to the attainment of this objective is assessed to be **positive** in the context of London as a whole and **minor to moderate** in magnitude.

***The alternative option (no LEZ Phase 3)***

- 5.6.45 Under the option of not introducing Phase 3, this benefit is likely to be greater as businesses, organisation and individuals will be able to avoid compliance costs altogether. There could be particular benefits for disability groups using minibuses which have been specially adapted, as these can be expensive to replace or retrofit. Consequently the costs for these groups can be higher.

<b>D – To contribute to enhanced health and wellbeing for all within London</b>	
D1. To address health inequalities and factors which negatively impact upon health and wellbeing	X

***The proposal (defer LEZ Phase 3 from 2010 to 2012)***

- 5.6.46 The Health Impact Assessment undertaken to inform the development of LEZ noted that the introduction of Phase 3 2010 was predicted to give rise to variable impacts for health and wellbeing.
- 5.6.47 The reduction of emissions would be expected to give rise to positive health impacts to residents, especially those (noting, in particular, those disproportionately affected by air quality – children, elderly, those with pre-existing conditions) living close to the road network (as measured by the shortening of life and the incidence of respiratory diseases).
- 5.6.48 The Equalities Impact Assessment undertaken for the original LEZ scheme showed that poor air quality is more likely to affect deprived communities. Deprived communities are more likely to be live in central/inner London, where air pollution concentrations are higher, and in less desirable locations (e.g. next to major roads). Deprived communities are also more likely to live in poorer quality buildings (single glazed windows etc) and there may be less opportunity to access open green spaces for recreational activities meaning children may play near busy roads, where air pollution concentrations are higher. Furthermore, the demographic influence on deprivation and housing means that members of ethnic minority groups may be more likely to experience the effects of air pollution in London.
- 5.6.49 With this in mind, any delays in improvements to air quality would have a greater negative impact on deprived communities, including ethnic minorities and, particularly, more vulnerable people such as the young, old or those with pre-existing conditions. However, as the loss of emissions reductions and total health benefits in the context of London is relatively small, any impacts on health inequalities will be similarly small. Consequently, the deferral of LEZ Phase 3 will have a **negative impact**, which will be **minor in magnitude**.

***The alternative option (no LEZ Phase 3)***

- 5.6.50 Not introducing LEZ Phase 3 at all would have a greater negative impact on health inequality.

D2. To promote enhanced health and wellbeing for all

X

**Table 8: Estimated health benefits from LEZ Phase 3**

	LEZ Phase 3 2010	LEZ Phase 3 2012	Difference
Analysis period	2010 - 2015	2010 - 2015	2010 - 2015
<b>Estimated health benefits</b>			
Years of life lost avoided – no lag	101	89	12
Years of life lost avoided – lag	110	97	13
Cardiac Hospital Admissions (Cases)	3	2	1
Chronic Bronchitis (Cases)	12	10	2
Infant Mortality (Premature deaths)	0	0	0
LRS adults with chronic symptoms (Days)	20,921	17,493	3428
LRS symptom days (children) (Days)	15,244	12,746	2498
Respiratory Hospital Admissions (Cases)	5	4	1
Respiratory medication use adults 20yr +(Days)	2,044	1,709	335
Respiratory medication use (children) (Days)	1,475	1,233	242
Restricted Activity Days (Days)	36,862	30,821	6041

***The proposal (defer LEZ Phase 3 from 2010 to 2012)***

5.6.51 The table above sets out the estimated health benefits of LEZ Phase 3 launched in 2010 and 2012. The deferral of LEZ Phase 3 results in health benefit materialising later in 2011 (through pre-compliance) and a limited reduction in this benefit. Relative to the option of not introducing Phase 3 at all, the proposal still confers important benefits.

5.6.52 However, the net health effect is hard to quantify with accuracy.

5.6.53 As previously identified, implementation of the Phase 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 admittedly likely to be small) on health and wellbeing.

5.6.54 While somewhat uncertain, the overall impact is considered to be **negative**, but only of a **minor magnitude**.

***The alternative option (no LEZ Phase 3)***

5.6.55 Not introducing LEZ Phase 3 at all would have a greater **negative** impact on health and wellbeing as all the potential health benefits would be lost.

<b>E – To contribute to the mitigation of and adaptation to climatic change</b>	
<b>X</b>	<p>E1. To contribute to the reduction of CO<sub>2</sub> emissions arising from within the London area</p> <p>E2. To reduce CO<sub>2</sub> emissions arising from operations and service provision</p> <p>E3. To enhance and facilitate adaptation to the impacts of climate change</p>

***The proposal (defer LEZ Phase 3 from 2010 to 2012)***

- 5.6.56 The inclusion of the 90,000 vehicles captured by Phase 3 of LEZ in 2010 (and pre-compliance from 2009) would have delivered some marginal benefits in reducing CO<sub>2</sub> emissions, through the accelerated entry into the vehicle fleet of more fuel efficient vehicles. The 2006 London Atmospheric Emissions Inventory shows that LGVs account for some 10% of London's road transport CO<sub>2</sub> emissions and the proposal will, therefore, result in a deferred reduction of emissions.
- 5.6.57 No significant effects on fuel consumption are expected where retrofit technologies are correctly specified.
- 5.6.58 The predicted impact with respect to the attainment of this objective is assessed to be **negative** in the context of London as a whole, but **minor / marginal** in magnitude given the limited timeframe for deferral. Under the option of not introducing Phase 3 at all, the adverse impact would be greater.
- 5.6.59 The policies and proposals identified in the Mayor's draft Climate Change Mitigation and Energy Strategy will assume a key role in tackling climate change through sources including, but extending beyond, transport.

***The alternative option (no LEZ Phase 3)***

- 5.6.60 Not introducing LEZ Phase 3 at all would have a greater **negative** impact on mitigating climate change as all the potential emissions savings would be lost.

## 6 Summary of the LEZ Phase 3 assessment, recommended mitigation and monitoring provision

### 6.1 Summary of the assessment of the proposal (defer LEZ Phase 3 from 2010 to 2012)

- 6.1.1 The assessment identifies that there are both predicted benefits and disbenefits of deferring LEZ Phase 3 from 2010 to 2012, relative to the baseline of retaining the introduction of Phase 3 in 2010.
- 6.1.2 As previously noted, the nature of these impacts stem from the delay in introduction. The predicted disbenefits arise in relation to the delayed and slightly reduced aggregate benefit to air quality across London, and the adverse - but relatively small - impacts this has in terms of the environment and health. There would also be small impacts on health inequalities and climate change mitigation.
- 6.1.3 Conversely, economic benefits are predicted to emerge through the deferral and reduction of the costs of compliance. As previously noted, the proposal will result in postponing pre-compliance and compliance costs and their impact on businesses, from 2009/10 to 2011, and also in reducing the scale of the costs overall. Relatively speaking, the same level of compliance costs have a larger impact on businesses when margins are tight and profitability is low – so these benefits are particularly important in the context of the current adverse economic conditions.
- 6.1.4 Social benefits are also anticipated to arise, in particular for community groups who will equally not be subject to such charges until later. This will also have some equalities impacts, particularly on the old, young and disabled who may be more dependent on using minibuses provided by community groups and charities.
- 6.1.5 The impacts of the proposal need to be considered in relation to the broader policies and proposals contained in the revised MTS and the draft MAQS which are specifically designed to achieve reductions in pollutant emissions and their impacts on the environment and human health. These measures are important because they provide a positive policy context during the fifteen month period of the deferral that would provide opportunities for making up any loss of benefit to air quality caused by deferral. They also provide a mechanism through which the Mayor can demonstrate that the deferral of LEZ Phase 3 does not compromise the attainment of limit values for PM<sub>10</sub> in 2011. Importantly, local measures provides a mechanism by which further action can be taken in response to monitoring data, allowing the Mayor to respond proactively to any unforeseen adverse effects of deferring LEZ Phase 3 from 2010 to 2012, if these were to arise.
- 6.1.6 The effect of implementing Phase 3 in January 2012 rather than October 2010 is to defer and somewhat reduce the benefit in terms of the emissions of air quality pollutants (by around 10% for PM<sub>10</sub> and around 20% for NO<sub>x</sub>). Meanwhile, the compliance costs would be lower (by about 25%) and consequent economic impacts would be mitigated. A range of factors need to be taken into account when considering the proposal, including the predicted balance of benefits and disbenefits identified; the relatively short timeframe for deferment of benefits and the projection that the scheme will still contribute to meeting the EU limit value for PM<sub>10</sub> in 2011.

- 6.1.7 **The overall assessment of the proposal is finely balanced but in light of the factors set out above it is assessed as positive. This reflects that the negative impacts of the proposal are assessed as minor in magnitude – as impacting upon the environment and human health – and the positive impacts as moderate in magnitude – as impacting upon socio-economic factors.**

## **6.2 Summary of the assessment the alternative option (no LEZ Phase 3)**

- 6.2.1 Under the option of not introducing Phase 3 at all, the environmental and health disbenefits would be greater than with the option of deferral of Phase 3 until 2012 - the envisaged benefits of Phase 3 will simply not materialise. This has particular consequences for achieving EU limit values and successfully addressing emissions as well as for health and health inequalities.
- 6.2.2 With respect to economic impacts, the compliance costs for business, organisations and individuals would be avoided if Phase 3 is not introduced i.e. the costs of either retro-fitting solutions or vehicle replacement to meet the emission standard would be avoided.
- 6.2.3 Relative to other sources in Greater London of PM<sub>10</sub> and NO<sub>x</sub>, reductions in LGV emissions under Phase 3 would be limited, with the emissions savings of PM<sub>10</sub> and NO<sub>x</sub> amounting to a reduction of around 1% of Greater London's transport emissions for these pollutants. However, while the LEZ cannot, in and of itself, be the solution to all of London's air quality problems it is an important part of the solution. Not only does it succeed in reducing emissions of PM<sub>10</sub> and NO<sub>x</sub>, but also it demonstrates clear intent to improve air quality. The scheme is, therefore, a positive instrument in reducing emissions in London. Its role in assisting the UK in meeting EU limit values is important, for both London and the UK. LEZ retains its value in these respects whether Phase 3 is introduced in 2010 or 2012.

## **6.3 Planned mitigation and complementary measures**

- 6.3.1 As set out in section 4, a range of mitigation measures have been identified and are incorporated within the policies and proposals of the Revised MTS and draft MAQS.
- 6.3.2 These measures collectively aim to improve air quality and, in effect, compensate for the lost reduction in emissions which would have been achieved under Phase 3 2010. These include:
- Promoting behavioural change to reduce vehicle emissions; for example through encouraging smarter driving techniques, eco driving training and better use of freight;
  - Reducing emissions from public transport and the public service fleet; for example through cleaner buses, taxis and PHVs; rail electrification; cleaner river vessels and cleaner public service and local authority vehicles;
  - Reducing emissions from the private vehicle fleet; for example by supporting the uptake of low emission vehicles, such as electric cars and vans;
  - Working with the London Boroughs and other stakeholders to develop targeted local measures at priority locations, including the use of power washing and the application of dust suppressants; and
  - Smoothing traffic flow to increase the reliability and predictability of journeys, including tackling "stop-start" traffic conditions, which have a particularly detrimental impact on air quality.

- 6.3.3 In terms of emission from road transport, the draft MAQS (including planned and additional measures and natural turnover of the fleet) expects to deliver around a 14% reduction in PM<sub>10</sub> emissions by 2011 (compared to the 2008 baseline) and around 35% reduction in NOx by 2015 (compared to the 2008 baseline)<sup>36</sup>.

#### **6.4 Recommendation for additional mitigation and enhancement measures**

- 6.4.1 The assessment has identified that there is a minor adverse impact in terms of air quality, and as per the Strategic Environmental Assessment ("SEA") Regulations, measures to mitigate this impact are subsequently identified. It is important to recognise however that the primary means of achieving this mitigation will be through implementation of the measures described in the MAQS and the wider suite of policies and proposals within the Revised MTS.
- 6.4.2 There are two generic approaches to providing mitigation or compensatory measures to offset the negative impacts of the deferral of Phase 3 until 2012. These are, reducing emissions by the same quantity on a London-wide basis through targeting all vehicular sources through the imposition of compensatory emissions standards, or reducing particular vehicular emission sources through alternative policy interventions. The opportunity also exists for other geographical areas or zones to be targeted, including the priority locations which are most likely to exceed the EU limit values. This will not have the specific impact on LGV emissions which the implementation of Phase 3 in 2010 would have delivered but could contribute to the same goal of reducing vehicular emissions to air and their associated negative impacts on environmental sustainability and health.
- 6.4.3 The Revised MTS provides a general policy context for the reduction of transport-related emissions, primarily through the commitment to Low Emission Zones and also targeting particular sections of the public transport fleet such as taxis. The nature and scale of either extensions/tightening of current emissions standards under LEZ, or the introduction of new low emissions zones are both allowed for.
- 6.4.4 Should air quality not improve in line with expectation further action should be taken. The Draft MAQS contains provision for greater and wider use of local measures. These provide a mechanism by which further action can be taken in response to monitoring data, allowing the Mayor to respond proactively to any adverse effects of deferring LEZ Phase 3 from 2010 to 2012.

#### **6.5 Continued monitoring of London's air quality**

- 6.5.1 Monitoring of any predicted significant impacts arising from a strategy, plan or programme, is an important element of an impact assessment. In the context of the predicted impacts assessed to potentially arise under the current proposal, it is recommended that such monitoring focuses on assessing air quality and the impacts this will have on health and wellbeing.
- 6.5.2 Air quality across London, and progression towards the EU limit values, will continue to be monitored at specific locations across London. It is challenging to quantify emissions and air quality changes. Outdoor air quality is affected by a wide range of factors, and the contribution by LGVs and minibuses may not be measurable through air quality monitoring

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<sup>36</sup> GLA (2010) Draft Mayor's Air Quality Strategy for public and stakeholder consultation

equipment. TfL have developed some modelling methods to calculate pollutants in the air, based on volumes of vehicles by type.

#### **Indicators to monitor the effect of the proposal**

- 6.5.3 It is recommended that the air quality modelling work continues as the mitigation measures are implemented, to understand whether the extent to which they work towards meeting EU limit values.
- 6.5.4 The measurements of pollutants at air quality monitoring sites across London should also be continued though it is recognised that it would be difficult to discern such subtle changes as Phase 3 would have delivered during the deferral period.
- 6.5.5 Monitoring provision should ideally be integrated into the monitoring framework proposed in the MAQS.