PROPOSED LONDON LOW EMISSION ZONE- ECONOMIC AND BUSINESS IMPACT ASSESSMENT

Final Report

Report

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Transport for London

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1. INTRODUCTION

Background

1.1 This document is the Final Report for the London Low Emission Zone Economic and Business Impact Assessment (EcIA). This study was commissioned by Transport for London (TfL) to examine the direct, indirect, and wider economic and business impacts that may result from the introduction of a Low Emission Zone (LEZ) scheme that broadly covers the Greater London Area (GLA area).

1.2 The objectives of the proposed LEZ are to further the aims of the Mayor's Transport and Air Quality Strategies by moving London closer to achieving the Air Quality objectives (and EU limit values) for 2010, in support of the Government's National Air Quality Strategy (NAQS) and the EU's Air Quality Framework and Daughter Directives.

1.3 The LEZ would deter the use of diesel-engined vehicles that do not meet certain specific emission standards from driving in Greater London by levying a daily charge for doing so. The charge, which would apply seven days a week, 24 hours a day, would be set at a rate to encourage operators to upgrade their vehicles. The current proposal is for the charge to be set at £200 for HGVs, buses and coaches, and £100 for minibuses and heavier LGVs. If payment were not made by the time limit set, the operator would be required to pay a penalty charge. It is proposed that the penalty charge would be between £1,000 (reduced to £500 if paid within 14 working days) for HGVs, buses and coaches, and £500 (reduced to £250) for minibuses and heavier LGVs. Operators of vehicles not meeting the required standards could either pay the charge, or take steps to comply with the standards. Operators would have to make decisions about how to make their vehicle fleets compliant. Options include fitting pollution abatement equipment or purchasing a compliant vehicle.

1.4 The proposed LEZ would be enforced using cameras and Automatic Number Plate Recognition (ANPR) technology. TfL would use data held by the Driver and Vehicle Licensing Agency (DVLA) and other agencies to establish the emissions standards of identified vehicles. In most cases, the date of first registration can be used to determine whether the vehicle complies with the proposed standards.

1.5 The proposed Scheme Order is summarised as follows:

TABLE 1.1 LONDON LOW EMISSION ZONE SCHEME ORDER

LEZ Vehicle Type	Heavier HGVs	Lighter HGVs	Heavier LGVs	Buses and Coaches	Minibuses
Analysis segment	HGVs, Private HGVs	HGVs, Private HGVs	LGVs	Buses and Coaches	Minibuses
Definition	Goods vehicles exceeding 12 tonnes (gross vehicle weight)	Goods vehicles between 3.5 and 12 tonnes (gross vehicle weight)	Goods vehicles between 1.25 tonnes (unladen) and 3.5 tonnes (gross vehicle weight)	Pax vehicles with >8 seats+ driver seat and > 5 tonnes	Pax vehicles with >8 seats+ driver seat and < 5 tonnes
European Vehicle Classification	N_3	N_2	N_1- class II, III	M_3	M_2
Date of LEZ inclusion	Euro III Feb 2008 Euro IV Jan 2012	Euro III July 2008 Euro IV Jan 2012	Euro III Oct 2010	Euro III July 2008	Euro III Oct 2010
Daily non-compliance charge	£200	£200	£100	£200	£100
Evasion penalty	£1,000 (£500 if paid within 14 days)	£1,000 (£500 if paid within 14 days)	£500 (£250 if paid within 14 days)	£1,000 (£500 if paid within 14 days)	£500 (£250 if paid within 14 days)
Cost of retro-fitting	£3,000- £5,000 to Euro III	£3,000- £5,000 to Euro III	£1,000- £2,000 to Euro III	£3,000- £5,000 to Euro III	£1,000- £2,000 to Euro III

Source: TfL

Objectives of the Economic and Business Impact Assessment

1.6 The objectives of this study are to understand the quantum and distribution of impacts that the proposed LEZ scheme would have on businesses and households, from its inception through to 2015/16.

1.7 The quantum of the effects relates to the changes in gross value added in the economy (GVA), household income and employment at the London borough, county and national (by Government Office Regions) levels.

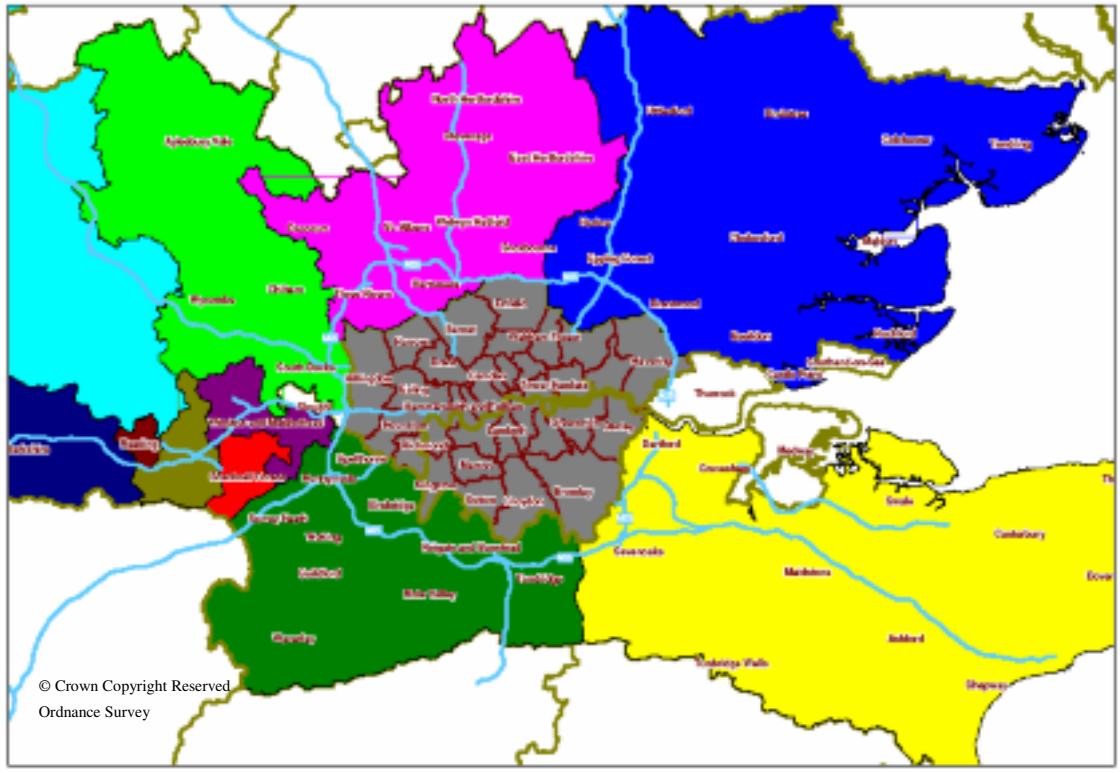
1.8 The distribution of the effects relates to the locations at which the changes take place and the types of businesses and consumers that would be affected.

Scope

1.9 Although the LEZ would only apply to an area within the Greater London (GLA) boundary, many operators who drive within Greater London are based elsewhere in the country. The LEZ would have

impacts that reach far beyond its physical boundary. Therefore, we have assessed the economic impacts within the 33 London boroughs, in the 15 counties and Unitary Authorities that are contiguous to the Greater London area, and in the eight government office regions (GORs). The following figure illustrates the areas that are immediately impacted by the proposed LEZ.

FIGURE 1.1 GEOGRAPHICAL COVERAGE OF THE ECIA



Source: SDG elaboration, Ordnance Survey base map

1.10 The LEZ, as currently proposed, covers four major vehicle types: Heavy Goods Vehicles (HGVs), Coaches and Buses, heavier Light Goods Vehicles (LGVs), and Minibuses. The approximate proportions of vehicles estimated to be non-compliant in 2008 or 2010[1] are:

- HGV 39% (2008)
- LGV 25% (2010)
- Coaches and Buses 49% (2008)
- Minibuses 45% (2010)

1.11 This study also covers the above vehicle segments and in addition, we subdivide each of the above vehicle segments according to operator

[1] Depending on the LEZ's requirements for each vehicles type. This proportion does not include vehicles that would be affected by the proposed second round standards in 2012.

type, fleet characteristics, and demand markets served. It is estimated that should the LEZ be implemented in 2008, only 39% of HGVs and 49% of coaches and buses would not be compliant with the LEZ standards. Should minibuses and heavier LGVs be included within the LEZ from 2010, only 25% of heavier LGVs and 40% of minibuses would not be compliant.

1.12 The impacts associated with the proposed LEZ would be felt by various participants in the London, regional, and national economy. It is worth noting that the costs associated with the LEZ would be spread across a large number of operators and consumers. We have grouped the participants into the following categories:

- Supply sectors, that provide transport services to businesses and individuals;
- Demand sectors, that are the consumers of these transport services;
- Ancillary sectors; and
- The wider economy.

1.13 Overseas operators would also come within the scope of the proposed LEZ. However, for practical reasons, they are not within the scope of the current analysis.

1.14 In many cases, the supply sectors and demand sectors overlap. This is the case for own-account operators (businesses that transport their own goods and services), private individuals, and community organisations.

Organisation of this report

1.15 The rest of this report is organised as follows:

- **CHAPTER 2** provides an overview of our study methodology;
- **CHAPTER 3** is a summary of the Heavy Goods Vehicle (HGV) market;
- **CHAPTER 4** is a summary of the Light Goods Vehicle (LGV) market;
- **CHAPTER 5** is a summary of the Coach and Bus market;
- **CHAPTER 6** is a summary of the Minibus market;
- **CHAPTER 7** is a brief description of the ancillary markets;
- **CHAPTER 8** explains and summarises the results from the Operator Cost Model calculation of the economic impacts associated with LEZ;
- **CHAPTER 9** translates the costs of LEZ into direct, indirect and induced impacts throughout the economy;

- In **CHAPTER 10**, we provide recommendations for the management and mitigation of the identified negative impacts, and for the maximisation of economic gain;
- In **CHAPTER 11** we describe a potential strategy for monitoring and evaluating the economic and business impacts
- **CHAPTER 12** is an non-technical summary of this study.

2. STUDY APPROACH AND METHODOLOGY

Framework of analysis

2.1 The objectives of this Economic Impact Assessment are to understand the potential size and distribution of the costs and impacts as a result of the LEZ. TfL has also commissioned other reports to examine the environmental, health and equalities impacts of the proposed LEZ, which are outside the scope of this study. The health impact assessment includes details of the monetised health benefits of the LEZ.

2.2 The proposed LEZ would cover four broad vehicle markets (HGVs, LGVs, Coaches and Buses, and Minibuses), which are largely independent. We conduct separate analyses for each of the vehicle markets, applying the same methodology in each case.

2.3 We first assume that the projected effects of the proposed LEZ can be grouped into four broad categories. For each category, we ask different questions:

TABLE 2.1 FRAMEWORK OF ANALYSIS

Effect category	Research questions
Supply side	■ Which vehicles would be affected? ■ How are the fleets organized? ■ Who operates these vehicles? ■ What markets/ businesses are the operators in? ■ Where are they based? ■ How would they respond? ■ What would be the costs associated with the response? ■ Who would bear the cost?
Demand side	■ What sectors do these vehicle operators serve? ■ Where are they located? ■ What would be their transport alternatives? ■ Do the costs get passed on to them? ■ Is the impact likely to be material?
Ancillary market	■ What is it? ■ Would the LEZ cost them or benefit them?
Wider economy	■ Where would the direct, indirect and induced impacts be likely to be realized and an estimate of their magnitude?

2.4 In order to answer these questions, we have organised our EcIA study as follows:

(1) We start by conducting **BACKGROUND RESEARCH** on each of the vehicle markets and ancillary markets in order to understand the universe of vehicles that would be affected, the characteristics of the operators in each market, the business processes and market conditions in each market, and how operators are likely to deal with the increased costs associated with the LEZ;

(2) We then establish vehicle parameters and response options that are specific to operator types. These are then run through the **TFL OPERATOR COST MODEL** to generate cost estimates by operator type between 2006 and 2015;

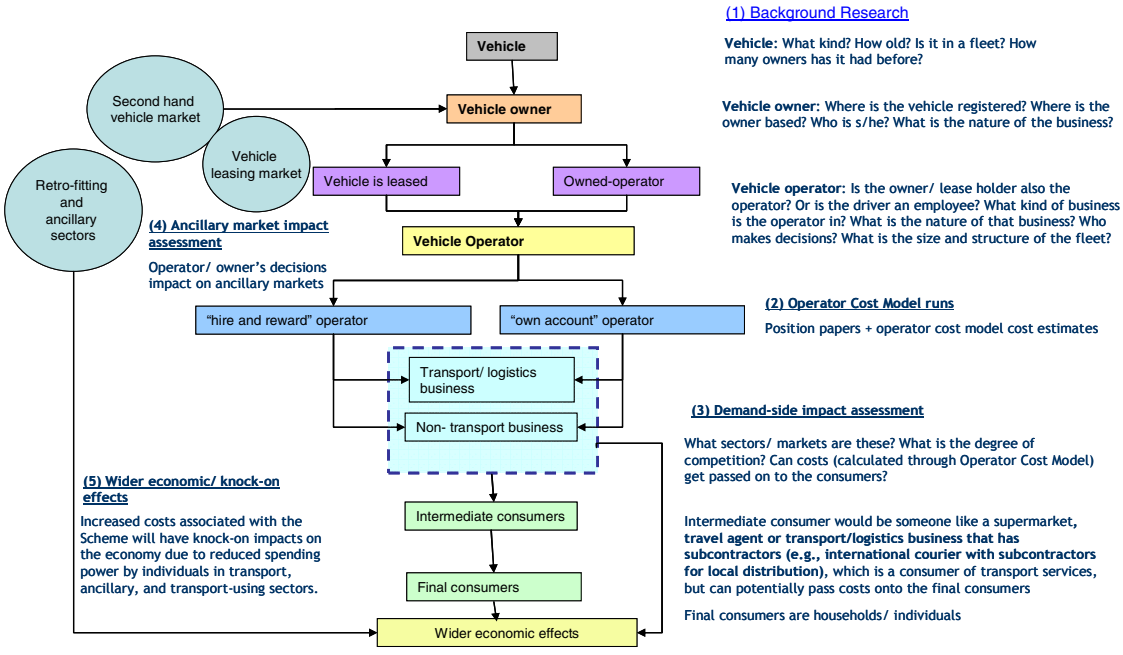
(3) The cost estimates are then translated into **DIRECT GVA, INCOME AND EMPLOYMENT IMPACTS** according to market characteristics;

(4) The response options for the proposed LEZ are then used to estimate the increase in revenue for **ANCILLARY SECTORS**; and

(5) Direct impacts are then translated into **WIDER ECONOMIC IMPACTS** (indirect and induced impacts) in London Boroughs, contiguous counties, and Government Office Regions (GORs).

2.5 The aforementioned effects are linked. The following figure illustrates the characteristics and chain of events that determine the costs and impacts associated with the proposed LEZ Scheme.

FIGURE 2.1 CHAIN OF IMPACTS



2.6 In the remainder of this chapter, we describe the methodology used in each stage of the analysis.

Background Research

Background and objectives

2.7 The magnitude of the costs that arise from a LEZ Scheme, and how these costs translate into impacts on the economy, depend on a number of factors. These include:

- the number of vehicles that are affected by the LEZ,
- the costs associated with compliance and non-compliance, and
- behavioural responses of the owners and operators of the affected vehicles.

2.8 The number of vehicles that are affected is influenced by the age and Euro standards of the population of vehicles travelling in the LEZ.

2.9 The costs associated with the different response options include costs of purchasing new or used compliant vehicles, costs of retrofitting and upgrading existing vehicles, the proposed daily LEZ charge, evasion penalty charge and the probability of evaders getting caught, and costs of other alternatives (e.g. modal shift, business relocation, closing down business). The behavioural responses of vehicle owners and operators are influenced by the conditions of the market in which they operate, and their business processes.

2.10 The distribution of these costs, i.e., how the costs get absorbed in the UK economy, depends on:

- Who are the direct consumers of transport services, and who are the final consumers;
- Who pays; and
- Where they are located.

2.11 The response an operator would adopt is determined by:

- The type of business they engage in;
- The market conditions in which the vehicle operator's business competes;
- Whether the vehicle operator owns or leases its vehicle;
- The turnover, transport costs, and cash flow characteristics of the business;
- The proportion of transport costs as part of overall costs;
- The characteristics of the fleet, the nature of the vehicles, and the costs associated with different response options; and
- The "do nothing" trend– what the operator would do in the absence of the LEZ in terms of vehicle replacement, purchase

and upkeep (according to fleet procurement strategy and replacement cycle).

2.12 On the other hand, demand market conditions (e.g., alternative transport modes, demand elasticity with respect to transport costs) and the geographic and sectoral distribution of final consumers determine how the costs associated with the responses are absorbed in the economy.

2.13 The "costs" to which we refer are incremental costs borne by operators/owners of non-compliant vehicles at the introduction of the proposed London LEZ, should the scheme be confirmed. To calculate such incremental costs, we first need to establish a "do nothing" scenario. Without the LEZ scheme, all operators/owners still bear a "baseline" cost of vehicle replacement, as vehicles are replaced when their economic lives draw to an end. In the "do nothing" scenario, all vehicles would, at baseline cost and over the long term, comply with the LEZ standards through existing patterns of vehicle replacement. The proposed LEZ, in effect, would bring this replacement schedule forward. Thus, all costs that we calculate at this stage would be the net costs that are incremental to the baseline replacement and maintenance costs.

2.14 Throughout the report all values quoted as "PV", or Present Value, have been discounted to 2006 values using the discount rate of 3.5%. Quoting present values provides a basis for comparison of future prices taking into account the change in inflation. Jobs are referred to as FTEs, Full Time Employment, throughout the report.

2.15 The research explore these characteristics in each of the vehicle markets that would be covered by the LEZ Scheme. The goals of these papers are to:

- Paint a better picture of the inventory of affected vehicles (number and operating characteristics);
- Understand the businesses that own and operate affected vehicles- the size of their fleets, the scale of their operations, what markets do they operate in, their expenditure on transport, how business decisions are made;
- Inform how rates of compliance would differ amongst different operators of the same vehicle type, and how the associated compliance costs would impact their business models; and
- Establish the "do nothing" scenario and the "natural" rate of vehicle renewal and upgrades in the absence of the LEZ.

Methodology

2.16 We begin the background research by dividing the vehicle markets into

sub-segments. These sub-segments are defined according to differences in vehicle ownership, fleet profile, procurement strategy, operational characteristics, and demand markets served.

2.17 Once the operator types are defined, we provide a description of the fleet profile, operational characteristics and likely reaction to the proposed LEZ according to the following data sources:

- DVLA/ Experian data: This bespoke dataset contains information about vehicle body type, age, residing postcode sector, and ownership history. While we recognise that where a vehicle is kept does not necessarily correspond to where it travels to, we use it as a proxy for estimating the number of vehicles that are likely to be affected by the proposed LEZ;
- VOSA data: This dataset contains depot information for HGVs. This, along with the DVLA/ Experian data set, allows us to identify operators by fleet size and ownership type. It also allowed a sample of operators by operator type to be identified for the Coach and Bus vehicle type;
- Coach and Bus operator websites were used to investigate market segment characteristics;
- Dun and Bradstreet data: This dataset contains the names and addresses of businesses by SIC codes. Some indicative employment figures are also included;
- 2006 TfL Operator Survey: This report relies on this survey for understanding operators' characteristics, fleet profile, and for estimating likely operator responses;
- TfL consultation documents: Operator and Local Authority Responses and concerns regarding the LEZ were reviewed to gain an insight into the market attitude towards the proposed scheme;
- Association of London Government (now London Councils) survey data on Local Government LGV fleets. This information is publicly available via their website;
- Stakeholder engagement: where public or survey information was not available, we identified and approached stakeholders. This was especially important in the community and minibus sectors, where survey data are limited; and
- London Atmospheric Emissions Inventory (LAEI) used as a source for the Operator Cost Model and providing estimations of vehicle numbers and mileage within London.

Specification for TfL Operator Cost Model runs

Background and objectives

2.18 TfL has developed a purpose-built Operator Cost Model that is used to

estimate the costs of complying with LEZ standards through vehicle upgrades, retrofitting, and purchase. The choices of actions that can be taken by owners/ operators of non-compliant vehicles that are modelled in the Operator Cost Model are:

- Make the vehicle complaint by replacing non-compliant vehicle with new compliant vehicle;
- Make the vehicle complaint by replacing non-compliant vehicle with used compliant vehicle;
- Make the vehicle complaint by fitting particulate trap abatement equipment to non-compliant vehicles;
- Make the vehicle complaint by re-engining non-compliant vehicles;
- Modify operating procedures by only using compliant vehicles in London and using others elsewhere (i.e. re-deployment of fleet);
- Use routes that avoid the LEZ;
- Switch to vehicles under 3.5 tonnes;
- Stop trading in London; or
- Attempt evasion by continuing to use non-compliant vehicles and risk being charged.

2.19 The model allows for different decision-making frameworks under which operators of non-compliant vehicles make their response decisions. These are:

- According to the responses gathered in the 2006 TfL Operator Survey;
- The "Whole of Life" framework, whereby operators are assumed to follow the lowest cost action over a 10-year period[2] given the initial capital expenditure, subsequent refresh costs and the sum of the operating costs (including fuel consumption);
- The "Minimum Capex" framework, whereby operators are assumed to follow the compliance option with the minimum initial capital cost. In this model, the on-going operating costs are not considered in the decision-making process; and
- The "Mixed Operator Action" framework, which assumes that some operators will decide according to the minimum cost compliance option, some will take the best value compliance option, and others will take the best value compliance option with a premium given to new vehicles.

2.20 The costs referred to in the above frameworks are the additional

[2] The 10 year framework reflects the present day value of all costs the operator would incur during the period. Under this framework the total 10 year cost is considered when defining responses rather than the size of the initial investment and its effects on operators' cash flows.

expenditures associated with the proposed LEZ. This means the amount of money an operator/owner would spend as a result of the LEZ being implemented and includes the cost of compliance and operating costs over the 10 year period. This figure is distinct and additional to the amount they would spend in a "do nothing" scenario i.e. no LEZ or similar scheme.

Methodology

2.21 The "Mixed Operator Action" model was used for estimating the incremental costs of the proposed LEZ. The use of this framework incorporates a range of responses within each vehicle type allowing different operators to respond differently to the LEZ. As such it is a modification to previous methodologies and we believe it reflects more accurately the range of decisions operators would take.

2.22 The vehicle market research make use of a range of research data including the 2006 TfL Operator Survey, analysis of DVLA registration data and desk research of operator segment characteristics. Based on this research and professional judgement, the research set out our assumptions of the proportions of operators in each vehicle and operator sub-segment that would respond to the LEZ by:

- Going out of business;
- Changing operational procedures (i.e. redeployment of fleet, avoiding London, etc.);
- Picking a minimum cost option;
- Picking a minimum capex cost option; and
- Picking a minimum cost option but placing a premium on new vehicles.

2.23 In addition, we specify the baseline compliance profile of vehicles in each of the vehicle and operator sub-segments from 2008 to 2015, assuming that the age distribution of vehicles in each sub-segment remains constant.

2.24 We then make projections on the annual number and vehicle kilometres in each vehicle and operator sub-segment between 2006 and 2015, based on our assumptions following reviews of DVLA registration data, LAEI projections and responses from the 2006 TfL Operator Survey.

Direct impacts

Background

2.25 The LEZ Scheme is associated with increased resource costs, through

accelerated injection of new vehicles into the market, or through retrofitting existing vehicles. How these costs translate into economic impacts, measured in terms of gross value added (GVA)[3], income (amongst households, government, charities and voluntary organisations) and employment (measured in Full Time Employment, FTE), depends on how these costs get passed on from vehicle owners to other sectors of the economy[4].

2.26 By examining operators and their fleet profiles, we have identified a number of responses that different types of operators may take in response to the proposed LEZ.

2.27 This methodology provides new analysis on the way that the proposed LEZ would affect different types of operators. The approach to date has used assumptions about the range of responses owners of vehicles would take as a result of the introduction of the scheme. Our approach takes into account a more detailed understanding of the composition of the fleet, the owners and operators of the affected fleet and their business circumstances.

2.28 The economic impact analysis also considers the proportion of the costs of compliance that would be absorbed directly by the owners of the vehicles (which in itself could have important employment and GVA implications), and also the extent that these costs could be passed through to the wider London economy through higher fares for passenger transport services, higher product prices, employment costs and fees.

2.29 Further, our analysis of the businesses and individuals that own the fleet provides a way of assessing how vehicle operators would pass on the costs by understanding the markets which they serve. The analysis of businesses and individuals determines the likely impact of complying with the proposed LEZ . The characteristics of the market, as set out below, are then applied to determine the extent to which operators recover their additional costs by passing them on to consumers.

2.30 To illustrate this approach, we provide a number of examples of the potential differential impact of the scheme.

2.31 First, consider a van owner who might incur £1,000 cost as a result of the scheme. The van owner may be able to increase prices to cover the

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[3] Gross value added is the difference between output and intermediate consumption for any given sector/industry. That is the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production.

[4] All values referred to as “PV”, or Present Value, in this report have been discounted to 2006 values using the discount rate of 3.5%.

costs of compliance. This would distribute the impact as more people would share the burden of the cost increases. These indirect effects would add to pressures for price inflation within sectors of the economy that are currently more dependent on the use of older, 'dirtier' vehicles. Overall these price increases would act to some extent to slow down economic activity in these sectors.

2.32 The van owner may, on the other hand, not be able to pass on the cost increase and would have to absorb the cost and as a result would have £1,000 less to contribute to the economy and delay investment decisions.

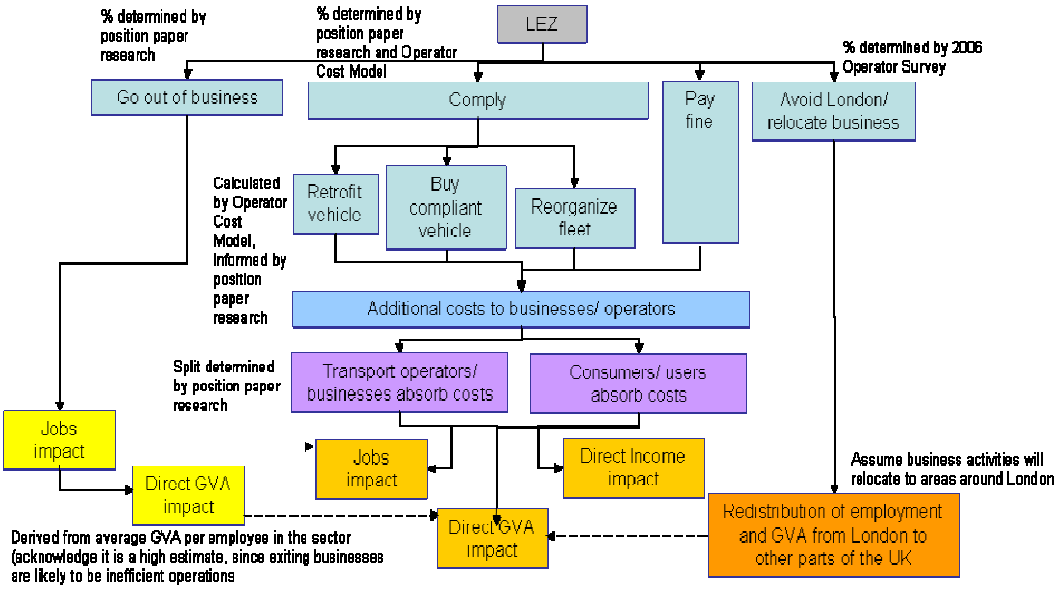
2.33 As a second example, we consider a large bus company operating long distance scheduled coach services. It is possible it not only competes with other bus companies but also with car and rail. Although large operators of scheduled coach services into London are likely to be compliant with the proposed LEZ were it to be introduced, many larger coach companies still operate older vehicles within London. These companies may be able to manage the costs of the scheme by re-organising their fleets and accelerating their replacement programme. With good management, the overall additional costs of the LEZ could be only a very small proportion of their annual costs of vehicle ownership. The competitive nature of these businesses (and the requirement to keep prices down to compete with car and rail) would mean that it is unlikely that the full effect of the cost increases would be reflected within long distance scheduled coach fares. Overall the proposed LEZ would have a marginal detrimental affect on the short term profitability of these businesses (costs increase but revenues stay the same), and as a result could marginally reduce the attractiveness of these transport businesses for investment.

2.34 Another example demonstrating an alternative outcome would be of a small coach operator with a fleet of ten older vehicles servicing long term transport contracts for a local authority within London, who may be faced with considerable upfront costs to comply with the scheme. Other competitors for these contracts are also likely to operate older vehicles, or offer newer vehicles with higher costs. Therefore, it is unlikely that the small operator with an older fleet will lose competitive advantage by increasing their prices to cover their additional costs. However, the increased costs of these services may deter price sensitive purchasers and overall consumption may decline. In this example, the local authority may have a fixed transport budget and may need to review service provision if prices increase.

2.35 The analysis of these business types provides some insight to assess the extent that different operator segments will need to absorb costs

(because some competitors will not need to raise prices) or pass on costs to their customers. Our methodology for Economic Impact Assessment uses this analysis and segmentation to determine which sectors of the economy are likely to be most affected by the scheme.

FIGURE 2.2 FROM COSTS TO DIRECT IMPACTS



Methodology

2.36 The characteristics of the markets in which vehicle owners/ operators operate determine whether they would absorb the additional costs themselves, or pass them on to the intermediate or final consumers.

2.37 We first assume that government, community and voluntary sectors are providing a public service, and as such will always absorb costs fully. The proposed LEZ would essentially increase the cost burden of those organisations running non-compliant vehicles, and would create additional pressure on government and community budgets.

2.38 According to the 2006 TfL Operator Survey, some operators would choose to exit the market(s) as a result of the LEZ, through relocating their business, avoiding London, or closing down their businesses. We assume that the market shares of exiting businesses would be fully absorbed by remaining operators or new entrants, albeit at higher costs than in a do-nothing scenario. There would therefore, presumably, be no job loss associated with these market conditions. Jobs are merely redistributed (from exiting businesses to new entrants, or relocated from London to non-LEZ areas). There would also be potential for GVA gain in this scenario, as “marginal” businesses that can no longer remain competitive in the LEZ area could be replaced by more economically

and environmentally efficient ones.

2.39 We adopt two generic frameworks under which the proposed LEZ costs translate into economic impacts: one where operators fully absorb costs, and one where costs are fully absolved from the operators, and the users of transport services bear the cost burden of the LEZ. In almost all cases, the end users of transport are UK households.

2.40 The assumptions associated with each framework are as follows:

Framework 1: No cost pass-through by operators

2.41 The assumptions of Framework 1 are as follows:

- The market is highly competitive with established market price;
- Consumers would only pay market price; and
- Existing suppliers who are already compliant could offer capacity at market price

2.42 The logical implications of these assumptions for Framework 1 are:

- Output and employment levels remain the same although shift from businesses that are currently not compliant with the LEZ to firms that are already compliant;
- Public sector and community budgets are assumed to remain stable and as such will come under pressure due to increased costs; and
- There is a consequential decrease in GVA of operators of non-compliant vehicles as sales remain the same while costs rise

Framework 2: Cost passed -through by operators to consumers

2.43 The assumptions of Framework 2 are as follows:

- Suppliers can increase prices without losing all market share;
- Consumers react to price change according to preferences and availability of alternatives; and
- Elasticity should be applied to whole change in price of product and not just the change in the transport element

2.44 The logical implications of these assumptions for Framework 2 are:

- Operators may maintain profit margins by raising prices to cover higher costs;
- Total sector output would fall due to higher prices. e.g. We hypothesize that this is likely to be the case in the commuter coach market as increased coach prices make rail or private

travel a more attractive alternative; and

- Output, GVA and, assuming constant employee productivity, employment will fall both directly and indirectly as effects are multiplied throughout the economy

Wider economic impacts

2.45 Indirect impacts refer to the changes in GVA/ Income/ Employment in sectors that are linked to the businesses/operators and consumers that would incur the costs associated with the proposed LEZ. Induced impacts refer to the second-order impacts generated by increased or decreased output and income of sectors that would be directly or indirectly affected by the LEZ. We identify the main indirect impacts of the LEZ to be in the following sectors:

- Tourism (e.g. restaurants, hotels, entertainment, museums) in London;
- Vehicle sales, maintenance and repair in London and surrounding areas; and
- Retail and service sectors in the economy that utilise HGVs, LGVs, coaches or minibuses for goods and service delivery, and sell to households.

2.46 We have treated the ancillary sectors as being directly impacted by the LEZ, and account for them in the Direct Impacts section. Indirect impacts generated by increased activities in these sectors are likely to involve businesses outside of London and surrounding areas, and the UK (e.g. vehicles and parts are likely to be imported).

2.47 In cases where vehicle owners pass on costs so that consumers bear a proportion of the cost of the LEZ (through higher prices for fares, products or services) we have modelled the effect on overall consumption within the economy[5]. Indirect and induced impacts for GVA and employment are estimated by applying regional Type II multipliers to our direct impact estimates (in the supply, demand, and ancillary sectors). As identified in the Employment and Tourism Impacts of the LEZ report (PwC 2006), multipliers can be derived from input-output tables, which are snapshots of the economy. Multipliers tend to overestimate the impact of an incremental change in the economy, as they cannot take into account the extent to which excess capacity currently exists in the economy. Multipliers should therefore be used

[5] By affected we refer to the vehicles we believe will exist and be non-compliant upon the introduction of the proposed LEZ. It includes the vehicles projected to be non-compliant at 2008, 2010 and 2012 depending on the compliance requirements for each particular vehicle type.

with caution, as they tend to overestimate the effect of a change in the economy. Nevertheless, we have adopted Type II multipliers published from the 1995 UK Input-Output tables (latest published multipliers) for our analysis.

Geographical distribution of impacts

2.48 The analysis is conducted at a regional, aggregate level, for Greater London, surrounding counties and unitary authorities, and the rest of the UK.

2.49 Having estimated the sectors that are affected, and the magnitude of such impacts, we then describe where these impacts are likely to take place. To that end, we

- Analyse the contribution to sectoral GVA by London, contiguous English counties, and Government Office Regions (GORs); and
- Review Dun and Bradstreet data and non-compliant vehicle densities within London to estimate the boroughs that could potentially receive the largest proportion of the economic impact.

2.50 We examine current employment patterns in order to identify the locations where employment changes are considered likely to take place. For example, if we know the magnitude of costs that is incurred by a particular type of operator in a vehicle market, we can explore the business and employment patterns amongst these operators/ businesses. If these businesses tend to concentrate in certain areas, then the employment impacts would also concentrate in these areas.

Sensitivity Analysis

2.51 The data on which this analysis has been based allows for some uncertainty in a number of key areas. While the central case rests on Steer Davies Gleave's own best judgement, other data suggests that, in three aspects, different base numbers might be appropriate. These key areas are:

- Estimates of the numbers of vehicles (by vehicle type) operating within the LEZ area
- Variation in vehicle operator responses to the scheme
- Economic multipliers.

2.52 As a response, we have developed 'High Cost' and 'Low Cost' to illustrate the sensitivity of the economic impacts to changes to key assumptions within the economic model.

High Cost Scenario

2.53 The estimates for the numbers of vehicle numbers within the high cost scenario are taken from the analysis of each of the vehicle markets. These analyses use DVLA registration data and the results of the 2006 TfL Operator Survey to estimate the numbers of vehicles operating within London. Generally these estimates are at the higher end of the range of estimates for vehicle numbers developed during the feasibility study for the LEZ.

2.54 This scenario also assumes that most operators in the end comply with the scheme through the substitution of compliant vehicles within their fleets) rather than paying (or evading) the charge. The scenario is founded on research evidence and the 2006 TfL Operator Survey data, as well as reviews of operators' responses to consultations on the LEZ, as well as study of their business dynamics to inform judgment as to the way that operators with non-compliant vehicles would respond to the Scheme Order. These assessments indicate that from 0% to 5% of owners of non-compliant vehicles will either pay the charge or risk evasion.

2.55 Finally, the high cost scenario assumes operators will increase prices so that costs of compliance can be recovered over a *five* year period.. At the same time, it is also assumed that only half the expected short term increases in employment in vehicle sales and maintenance are sustained in the longer term.

Low cost scenario

2.56 The estimates for the numbers of vehicle numbers within the low cost scenario are taken from the mid-ranges of estimates developed during the feasibility study for the LEZ.

2.57 This scenario also assumes that 14% of owners of non-compliant operators would either pay the charge or risk evasion

2.58 The low cost scenario also assumes a lower long term impact of cost increases on the wider economy. The scenario assumes that all the costs of the scheme that are passed on from vehicle operators to consumers would be spread across the full evaluation period (i.e. vehicle operators raise prices so as to recover the costs over the ten year period of evaluation). The scenario also assumes that full benefits to ancillary sectors from investments into vehicles sales and maintenance sectors are sustained throughout the evaluation period.

3. HGV MARKET SUMMARY

Introduction

3.1 Heavy Goods Vehicles (HGVs) are vehicles capable of carrying a load, with a gross laden weight over 3.5 tonnes. They are almost exclusively used for commercial purposes, and are generally used to convey goods rather than for the provision of services. There is significant variability in the commodities carried and in the factors that drive decision-making processes behind the operation and deployment of vehicles.

3.2 All HGVs will be covered by the current LEZ scheme proposal. The current proposal would require HGVs operating within Greater London to comply with Euro III standard for PM by 2008 and with Euro IV for PM by 2012. Given vehicle manufacturing trends and regulations, this implies that any unmodified vehicle over seven years old in 2008 would be non-compliant with the proposed LEZ requirements at that time; and unmodified vehicles over six years old in 2012 would be non-compliant by that year.

Types of operators

3.3 Two of the most important factors driving the response to the proposed LEZ scheme would be the size of the fleet, and whether or not the operator is a hire/reward company or where transport is not their core priority. Based on our knowledge of the HGV sector, the following segments have been defined in order to best group operators:

- Small own transport operator with 1-25 vehicles
- Large own transport operator with >25 vehicles
- Small hire/reward transport operator with only one vehicle
- Medium hire/reward transport operator with 2-25 vehicles
- Large hire/reward transport operator with >25 vehicles

Fleet profile

3.4 Table 3.1 shows the total HGV fleet by vehicle type and operator characteristics (from SDG analysis of Vehicle Licensing Statistics (VLS) and Road Freight Statistics data).

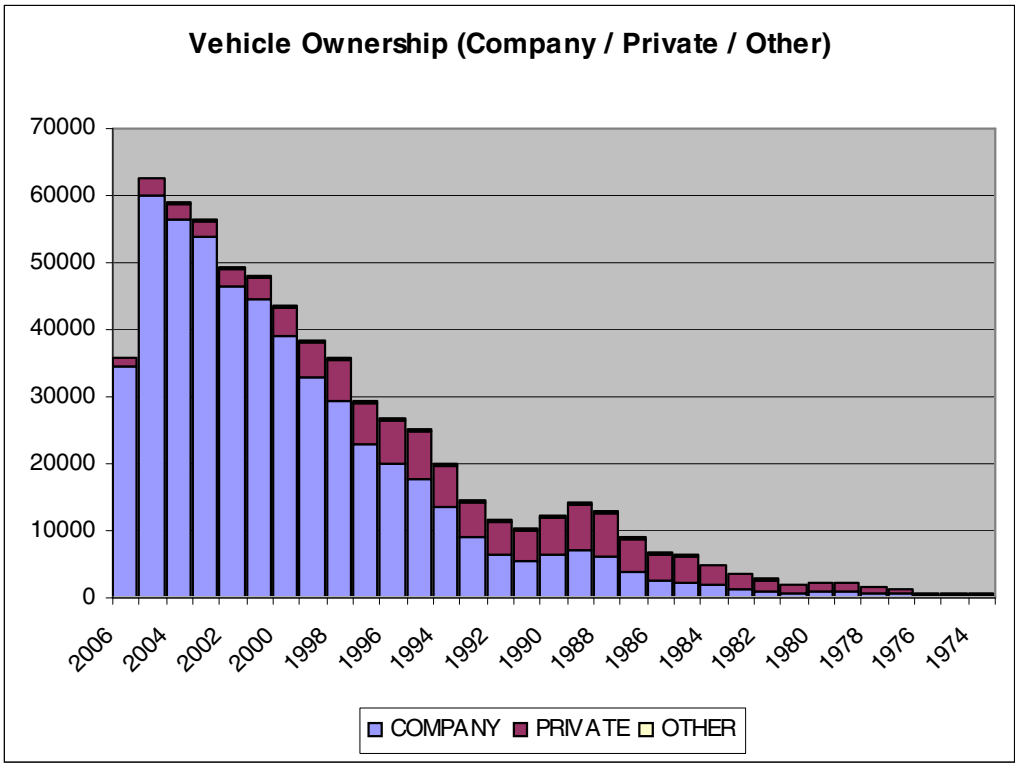
TABLE 3.1 HGV FLEET BY VEHICLE TYPE AND OPERATOR CHARACTERISTICS

Vehicle Type	Total Fleet	Mainly Own Account Transport		Mainly Public (Hire/Reward) Haulage	
		Number of Vehicles	% of Total Fleet (by type)	Number of Vehicles	% of Total Fleet (by type)
Rigid	324,100	235,297	72.6%	88,803	27.4%
Articulated	117,000	34,983	29.9%	82,017	70.1%
TOTAL	441,100	270,280		170,820	

Source: SDG analysis of Vehicle Licensing Statistics and Road Freight Statistics

3.5 Figure 3.1 shows the current age profile of the UK HGV population. 47.8% of the total HGV fleet were first registered since January 2001: it can be assumed that at least this percentage of HGVs licensed in the UK are of Euro III standard or better, and are therefore already compliant with the initial LEZ threshold. We assume throughout this section that this profile will remain similar to 2008 although the actual number of vehicles may change, and that 61% of the fleet would be compliant with the proposed LEZ should it be introduced in 2008 without the need to take any further action.

FIGURE 3.1 VEHICLE OWNERSHIP BY YEAR OF FIRST REGISTRATION AND NATURE OF OWNER



Source: DVLA data

3.6 Looking at the ownership profiles in more detail, HGVs tend to be purchased 'new' by companies, with ownership transferring to private owners (individuals) later on in the life of the vehicle. By the time the vehicles are eight years old, around 20% of vehicles are in the hands of individuals as opposed to large hire and reward companies, rising to around 25% in ten years and 32% in twelve years.

3.7 The data also indicates that:

- 4.6% of the UK total fleet is based in London; and
- 5.5% of the UK total fleet is based in counties contiguous to London.

3.8 A marginally lower proportion of vehicles based in Greater London would comply with the Euro III LEZ threshold than of the total UK fleet. For the UK as a whole 52.2% of HGVs are registered before January 2001, the equivalent figure for Greater London is 57.3%.

3.9 Table 3.2 identifies the proportion of the fleet (and proportion of distribution activity) that takes place within the proposed LEZ area.

TABLE 3.2 HGVS AFFECTED[6] BY THE LEZ

	% of fleet affected	Number of vehicles affected
London-based	100%	26,425
Non-London based	40%	165,870
Total		192,295

Source: SDG analysis

3.10 The estimated split between the operator types is shown in the following table.

TABLE 3.3 NUMBER OF HGVS BY OPERATOR TYPE

Operator type	Total HGVs	HGVs using LEZ
Small own transport operator (1-25 vehicles)	106,500	47,567
Large own transport operator (>25 vehicles)	14,200	6,495
Small hire and reward transport operator (1 vehicle)	21,600	9,245
Medium hire and reward transport operator (2-25 vehicles)	157,400	68,396
Large hire and reward transport operator (>25 vehicles)	141,400	60,592
Total	**441,100**	**192,295**

Source: SDG analysis

3.11 The proportion of non-compliant HGVs in 2008 across operator types is shown in the following table.

TABLE 3.4 PROPORTION AND NUMBER OF NON-COMPLIANT HGVS IN 2008 BY OPERATOR TYPE

Operator type	Proportion	HGVs
Small own transport operator (1-25 vehicles)	46.4%	22,070
Large own transport operator (>25 vehicles)	36.1%	2,340
Small hire and reward transport operator (1 vehicle)	38.8%	3,590

6

Medium hire and reward transport operator (2-25 vehicles)	38.8%	26,540
Large hire and reward transport operator (>25 vehicles)	32.8%	19,870
Total	**39%**	**74,410**

Source: SDG analysis

Demand segments served

3.12 Analysis of data on goods lifted with an origin and/or destination in Greater London in 2002 enables us to estimate that the following sectors are being served by HGVs operating in Greater London:

- Agriculture & Forestry: 4.6%
- Retail & Wholesale: 48.6%
- Construction: 18.3%
- Manufacturing: 28.5%

3.13 It has not been possible to derive different commodity breakdowns for the goods carried by the five different operator types into which the market has been segmented. Therefore the same estimated breakdown of the total market breakdown was used for all groups.

Anticipated responses

3.14 A review of the 2006 TfL Operator Survey informed a judgement as to the anticipated responses to the proposed LEZ scheme. These are summarised by operator type in the table below.

TABLE 3.5 ANTICIPATED RESPONSES TO THE LEZ BY OPERATOR TYPE

Response	Small own transport operator	Large own transport operator	Small hire & reward	Medium hire & reward	Large hire & reward
Evade/pay charge	2%	2%	2%	2%	0%
Redeploy fleet to use newer vehicles in London	3%	30%	0%	10%	40%
Go out of business	5%	5%	10%	1%	0%
Make vehicle fleets compliant					
Minimum cost option	40%	8%	58%	40%	10%
Best value option (BV)	25%	35%	20%	23%	30%
BV with new vehicle premium	30%	25%	20%	25%	20%
Total: making vehicle fleets compliant	90%	68%	88%	87%	60%

Source: SDG assessment

3.15 The results from the TfL Operator Survey suggest that it is highly unlikely that operators would risk being non-compliant at the level of charges/penalties presented in the survey.

3.16 The results also suggest that smaller operators would be less likely to redeploy their fleets than larger operators.

3.17 Smaller operators reported, more often than larger operators, that they would choose the minimum investment cost to become compliant. This tendency is likely to result in the smaller operators incurring a greater cost per vehicle in the long run than assumed by the larger operators.

Impacts

3.18 Table 3.6 shows how the different operators would be expected to pass on resultant costs from the LEZ.

TABLE 3.6 IMPACTS BY OPERATOR TYPE (HGV)

	Small own transport operator	Large own transport operator	Small hire & reward	Medium hire & reward	Large hire & reward
Absorb costs	0%	0%	90%	50%	0%
Pass costs on to customer	95%	95%	0%	50%	100%
Exit market	5%	5%	10%	1%	0%

Source: SDG assessment

3.19 Operators would generally be expected to pass on the cost of compliance to their customers. Our experience with these market sectors would suggest that small hire and reward operators have a weak bargaining position, particularly if sub-contracting to larger businesses that also provide hire and reward services. The owner operators in the small hire and reward sector expect to absorb all the cost, whilst those medium in size would be able to pass on some of the cost to their customers.

Sensitivity analysis

3.20 The data described above provides the analytical foundations for the 'High Cost' scenario inputs to the Economic Impact model.

3.21 The 'Low Cost' scenario that has been developed to test the sensitivity of the economic impacts to changes in inputs assumes a total number of 160,000 vehicles regularly operating within the LEZ and a constant

14% of operators who would choose to evade or pay the charge.

Conclusion

3.22 It is expected that all HGV operators of non-compliant vehicles based in London and 40% of the remaining UK fleet would be affected by the introduction of the proposed LEZ scheme. Evidence from DVLA-derived Experian data suggests that, without intervention, 39% of the UK HGV vehicle fleet would be non-compliant in 2008, when the first phase of the scheme is expected to be introduced.

3.23 Smaller operators, particularly hire and reward carriers with a single vehicle, expect to be worst affected by the additional cost of complying with the scheme. Other segments of the market have the option to re-deploy their fleet so that non-compliant vehicles are routed to avoid London, and given their relatively weak negotiating position *vis-à-vis* their customers, it is considered likely that the cost of compliance will be absorbed by these operators.

3.24 Conversely larger operators would have greater scope to either avoid the payment of the charge through re-deployment or by passing on costs as an increase in product price or as a variation in contract terms. Additionally, these fleets tend to be made up of predominantly newer vehicles in accordance with a three- to seven- year replacement cycle, so would be less likely to be affected by the proposed LEZ requirements.

3.25 Within London, the geographical distribution of the HGV fleet suggests that the impacts of the LEZ would be felt most strongly in outer London, particularly those with a significant amount of industrial activity, and boroughs where there is part of the major highway network (M25, M4, A13, and M1).

3.26 In terms of the geographical distribution of impacts outside London, it is believed that these would be felt in all regions of the UK, with a similar proportion of vehicles required to visit the LEZ area. However, as there are higher concentrations of HGVs in the South East, East of England, the North West and the Midlands, the potential impacts could be greater in these areas.

4. LGV MARKET SUMMARY

Introduction

4.1 In comparison with the other types of vehicles covered by the scheme, the volume of LGVs is large. Their population structure ranges from very large fleets of utility and delivery companies to one person businesses with a single van.

4.2 The LEZ scheme proposal includes only diesel-engined "heavier LGVs". These are defined as vehicles with European vehicle classification N_1 Class II and III i.e. goods vehicles between 1.25 tonnes (unladen) and 3.5 tonnes (gross vehicle weight). N_1 Class I vehicles are not included in the proposed scheme; these include car-derived vans and small purpose-built vans with similar emissions characteristics to cars.

4.3 The "heavier LGVs" are to be included in the scheme from October 2010. The minimum emissions standard for these vehicles would be Euro III for PM. In October 2010 any LGV less than eight years and nine months old would be compliant (although some vehicles older than this would also be compliant).

Types of operators

4.4 The LGV sector has been segmented as follows:

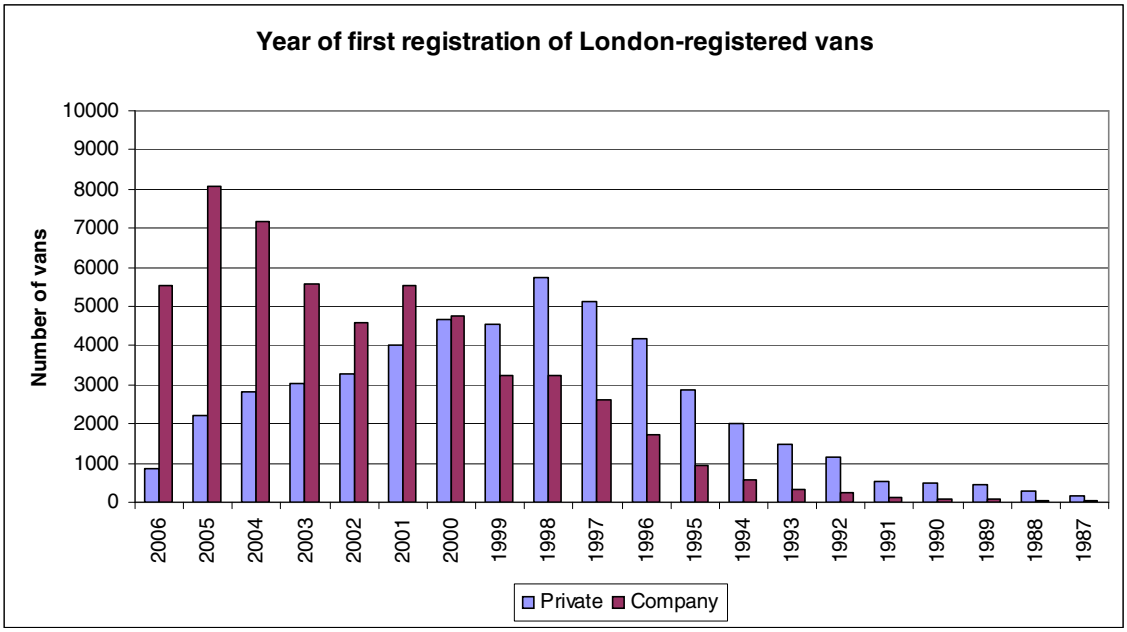
- Company-owned vans – medium/large fleets (assumed to be 11 or more vehicles);
- Company-owned vans – small fleets;
- Privately-owned vans (privately owned, private and business use); and
- Public sector.

4.5 Operators of smaller fleets are more likely to be affected by the LEZ as they tend to have older vans and operate with only one or two depots or bases. This geographical characteristics, combined with the smaller numbers of vehicles these fleets consist of, means smaller fleet operators would find it more difficult to redeploy their fleet to avoid the LEZ compliance costs or non-compliance charges.

Fleet profile

4.6 The following analysis is based on an extract of DVLA data for LGVs in the UK. The chart clearly shows that, on average, privately-owned vans are significantly older than company-owned vans.

FIGURE 4.1 AGE PROFILE OF LONDON-REGISTERED VANS



Source: DVLA data

4.7 According to DVLA data, 8% of company-owned vans would be non-compliant in October 2010 if no action was taken. For the case of privately owned vans this figure rises to 33%.

4.8 Privately-owned vans are much more likely to be purchased second hand than company-owned vans (85% and 45% respectively for London-registered vans).

4.9 The profile of vans in local authorities contiguous to London is similar to that of London-registered vans although vans in the contiguous area tend to be newer than in London.

4.10 Within London there are significantly more vans per borough in Outer London boroughs than in Inner London boroughs, particularly for privately owned vans.

Demand segments served

4.11 The service sector dominates over the delivery sector as shown in the table below. For company-owned vans only 30% of business trips (40% of vehicle-km) related to the collection and delivery of goods and equipment. For privately-owned vans the percentage was even lower at 28% of trips (28% of vehicle-km).

4.12 For company-owned vans 63% of business trips (53% of vehicle-km) consisted of work to/from home trips and travelling between work locations.

4.13 For privately-owned vans the percentage for the same journey motive was 64% of trips (67% of vehicle-km).

Company-owned vehicles

4.14 The biggest industry sector served by company-owned vehicles was the construction industry (accounts for 29% of business vehicle-km) while other sectors with significant shares are: wholesale, retail, restaurants and hotels (19%), other manufacturing industries (16%), transport and communication (13%), banking, finance and insurance, business services and leasing (9%). 50% of goods carried related to construction.

Privately-owned vehicles

4.15 The biggest industry sector served by heavier LGVs within the scope of the proposed LEZ would be the construction industry (accounts for 48% of business vehicle-km, 45% of trips) with 46% of goods carried relating to construction.

4.16 As noted above, the majority of in scope heavier LGVs, to which the proposed LEZ would apply, are used by tradesmen (largely in the construction industry) as vehicles for getting to/from jobs and carrying equipment, rather than as dedicated delivery vehicles.

4.17 The customers of these operators are businesses and households located throughout London and the surrounding contiguous area.

Public sector operators

Demand characteristics

4.18 Local authority vehicles undertake a wide range of duties all related to the public sector including health, education, refuse collection, housing and other community services that benefit local households and businesses.

Fleet Profile

4.19 The analysis of the public sector fleet profile is based on the 2004 ALG Borough Fleet Survey.

4.20 An ALG Borough Fleet Survey covered vehicles owned or leased by London boroughs. The survey identified 8,200 vehicles of all types for 29 (out of the total of 33) boroughs. The completeness of the information received from the boroughs was questioned in the survey

report and this figure could therefore be on the low side. The major vehicle categories were:

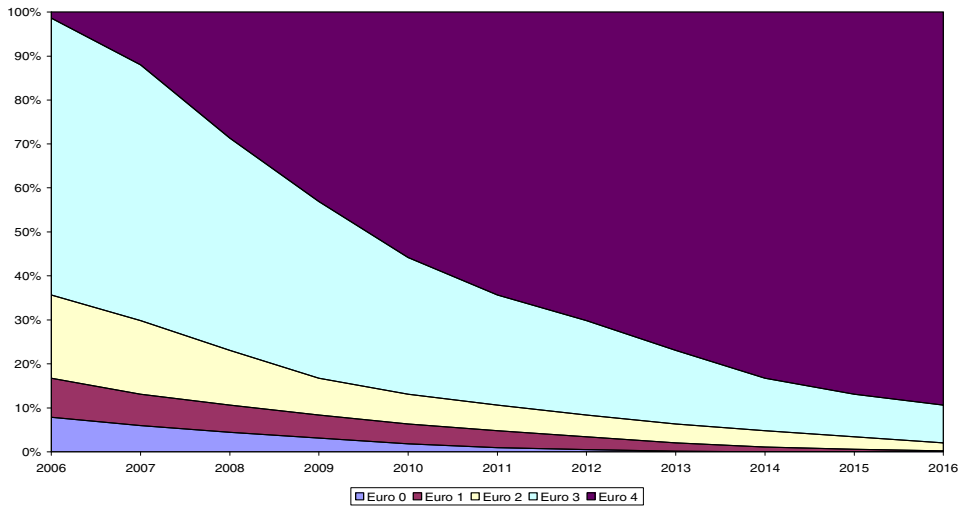
- Cars 14%
- Minibuses 13%
- Vans (less than 3.5 tonnes) 36%
- Rigid lorries (over 3.5 tonnes) 20%

4.21 Survey responses provided by individual boroughs showed a diversity of fleet sizes, ownership, type of vehicles operated, age profile, average mileage operated and steps taken to reduce emissions. A diverse range of vehicles is required to support a wide range of needs. These diverse types have very different patterns of utilisation and length of service.

4.22 The average age of vehicles in the ALG survey is less than five years. However, the age profile shows that a small proportion of vehicles are kept for a very long period of time.

4.23 The figure below shows the estimated Euro standard profile of the authorities' vehicle fleets on the basis of the ALG survey data. This shows that 13% of the fleet would be non-compliant in October 2010 if operators continue with their present vehicle replacement behaviour.

FIGURE 4.2 AGE PROFILE OF LONDON BOROUGH VEHICLE FLEETS



Source: ALG survey

4.24 The survey report notes that there are wide variations between individual boroughs. Further analysis at borough detail is not possible as the data is anonymised.

4.25 From the survey it is also apparent that those boroughs which lease their vehicles tend to have younger fleets than those which own their vehicles.

Anticipated responses

4.26 Anticipated responses to the proposed LEZ scheme are summarised by operator type in the table below.

TABLE 4.1 LIKELY RESPONSES TO THE LEZ BY OPERATOR TYPE FOR LGVS

Response	Company – med/large fleet	Company – small fleet	Privately -owned	Public
Evade/pay charge	0%	1%	1%	0%
Redeploy fleet to use newer vehicles in London	28%	13%	4%	0%
Make vehicle fleets compliant				
Minimum cost option	0%	36%	40%	0%
Best value option (BV)	29%	36%	40%	0%
BV with new vehicle premium	43%	14%	16%	100%
Total: making vehicle fleets compliant	72%	86%	95%	100%

Source: 2006 TfL Operator Survey, ALG survey

4.27 The table suggests it is highly unlikely, at the level of charges/penalties presented in the survey, that operators will risk being non-compliant.

4.28 As hypothesised, the smaller operators would be less likely to redeploy their fleets.

4.29 It appears smaller operators would also be more likely than larger operators to choose to minimise investment cost to become compliant. This would be likely to result in the smaller operators, both company and private, assuming a greater cost over time than assumed by the larger operators.

Impacts

4.30 Table 4.2 shows how the different LGV operators would be expected to pass on resultant costs from the LEZ. The figures are based on the 2006 TfL Operator Survey.

TABLE 4.2 IMPACTS BY OPERATOR TYPE (LGV)

Impact	Company	Company	Privately	Public

	– med/lg fleet	– small fleet	-owned	
Absorb costs	48%	44%	50%	0%
Pass costs on to customer	46%	53%	39%	100%
Exit market	6%	3%	11%	0%

Source: 2006 TfL Operator Survey, ALG survey

4.31 The results from this table show more similarity between the large company and the privately-owned operators.

4.32 The surveys suggest privately-owned operators would be the most likely to exit the market or cease to operate their vehicles (11%) and also the most likely to absorb costs (50%).

4.33 The surveys also suggest that company-owned small fleets would be most likely to pass on the costs to their customers and also the least likely to exit the market.

Sensitivity analysis

4.34 The data described above provides the analytical foundations for the 'High Cost' scenario inputs to the Economic Impact model.

4.35 The 'Low Cost' scenario that has been developed to test the sensitivity of the economic impacts to changes in inputs assumes mid-range estimates from the feasibility study with a total number of some 260,000 vehicles regularly operating within the LEZ and a constant 14% of operators who would choose to evade or pay the charge.

Conclusion

4.36 Companies with larger fleets tend to have newer vans and to be able to redeploy fleets. As such the proposed LEZ would be unlikely to have a significant impact on them. The LEZ would have a bigger impact on companies and private operators with smaller fleets.

4.37 Almost half of all vans are privately owned. If no action were taken, a significant number of these would be likely to be non-compliant.

4.38 The majority of LGV operators are in the service sector, rather than in the haulage/freight sector. The largest single industry sector is construction.

4.39 There are more LGV operators per Outer London boroughs than per Inner London borough. This imbalance is greatest amongst private operators.

4.40 Where operators incur extra costs as a result of the LEZ, around 50%

of companies and 40% of private operators say that they will pass them on to the customer.

5. COACH AND BUS MARKET SUMMARY

Introduction

5.1 The definition of buses and coaches that will be used to classify vehicles within the LEZ scheme from 2008 is any passenger carriage vehicle over five tonnes gross weight that has seating capacity for over nine passengers including the driver.

5.2 This definition covers all double-deck buses, single-deck buses, midi sized buses and standee buses (of the type often used to transfer passengers at airports). TfL managed buses would be included in the proposed LEZ scheme, but as they are all compliant with the 2008 LEZ standard, they are not within the scope of this study.

The LEZ standard

5.3 The LEZ scheme proposes two stages for the upgrade of emissions standards of buses and coaches. The first stage requires a minimum PM emissions standard of Euro III from July 2008. Subsequently, from January 2012 the minimum emissions standard for these vehicles will be Euro IV for PM.

5.4 Euro III became compulsory for new vehicle types from January 2000 and for all new vehicles from January 2001, so that in July 2008 any bus or coach less than eight years and six months old will be compliant.

The use of buses and coaches

5.5 The versatility of buses and coaches is shown by the range of products the industry offers including:

- Urban and inter-urban bus services;
- Short term charters for holidays, tours, excursions and airport transfers;
- Long term contract hire:
  - Education authorities or schools for taking pupils to and from school and sports facilities;
  - Businesses for staff or hospitality travel;
  - Travel agents;
  - Public bodies (e.g. police or armed forces) for staff transport in connection with special events; and
  - Rail replacement services, e.g. during planned engineering work or to cover emergencies.
- Scheduled long distance coach services.

Fleet profile

5.6 The geographic area of operators affected by the proposed LEZ would be national in scale because of the long distances that are covered by coaches. Most of the impact will be within London and the journey to work horizons around the capital. However, a significant proportion of coach trips to the capital are by tourists who travel from around the UK and Europe.

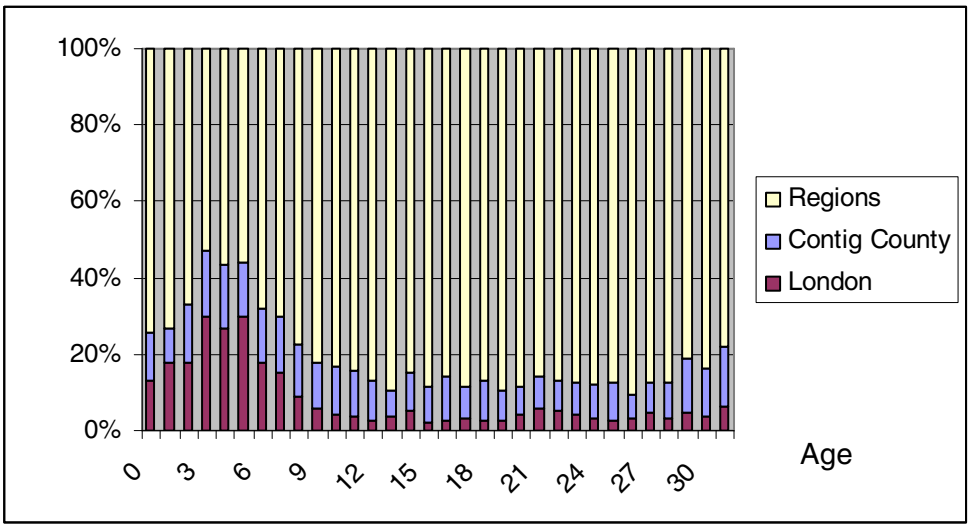
5.7 There are about 84,000 buses and coaches currently registered in the UK of which it is estimated there are about 21,000 coaches (from CPT's Prospectus for the coach industry). Buses tend to be used to provide local scheduled services and in the main would be outside the scope of the LEZ scheme. Bus services within London are tendered by TfL and by stipulation of the contract these vehicles need to comply with the relevant emissions standards. Local bus services outside London by nature of their geographic location would not be affected by the scheme. Therefore the core of the fleet that would be affected would be the remaining coach and bus operations within the M25 that are not contracted to TfL, most coach operators located in counties neighbouring London and long distance coach operators from the rest of the UK.

5.8 By the time of the proposed introduction of the scheme in 2008, should the LEZ be confirmed, there are expected to be between 11,500 and 14,500 buses and coaches that will be affected by the LEZ. The analysis describing the derivation of these estimates is provided in Appendix C.

5.9 Many buses begin their operational lives within London and as they age are moved to serve other networks around the UK. DVLA data shows that the average age of buses registered in London is 7.2 years, in contiguous counties the average increases to 11.2 years, and for the rest of the country it is 12.4 years.

5.10 The graph shows that London is the home for about 20% of all buses and coaches less than eight years old, however only about 5% of vehicles older than eight years are located in London.

FIGURE 5.1 AGE DISTRIBUTION OF UK COACHES AND BUSES



Source: DVLA data

Segmentation

5.11 There are distinct types of coach and bus operations and these businesses have been segmented into the following types:

TABLE 5.1 SEGMENTATION OF BUS AND COACH OPERATORS

Operator Type affected by LEZ	Fleet Size	Age of fleet
Super-operators	>80	Avg age >=10 years
Niche operators with older vehicles	<20	Avg age >=10 years
Niche operators with younger vehicles	<20	Avg age < 10 years
Mid range operators	Between 20 and 80	varied
Local authorities and community transport	(fleet size not part of definition)	(age not part of definition)

Sensitivity analysis

5.12 The data described above provides the analytical foundations for the 'High Cost' scenario inputs to the Economic Impact model.

5.13 The 'Low Cost' scenario that has been developed to test the sensitivity of the economic impacts to changes in inputs assumes a total number of 10,000 vehicles regularly operating within the LEZ and a constant 14% of operators who would choose to evade or pay the charge.

Conclusions

5.14 It is likely that London-based smaller operators with older fleets could face a series of large one-off costs, potentially causing some of these businesses to consider reducing the size of their operations, move out of London or in extreme circumstances close down.

5.15 Our assessment is that some of these smaller businesses would be unlikely to be able to find the financing to invest in the best value and most sustainable options for complying with the scheme. As a consequence it may be that these businesses would need to resort to a contraction of the size of their fleet to be able to pay for particulate traps to be fitted and maintained. With the higher operational costs associated with the filters and potential loss of business, some operators may be potentially unable to afford the further investments required to comply with the proposed Euro IV for PM standard in 2012.

5.16 It is also our view that the mid-range operators would be more likely to have the ability to find the finances to invest in compliant fleet will be well positioned to pick up much of the contract work from the retrenchment of smaller operators. As a result there may be a concentration of business amongst fewer larger operators.

5.17 Some cost savings could result from efficiencies of scale (e.g. more productive engineering and maintenance). At the same time there would be a tendency for a reduction in the number and geographic distribution of depots resulting in operators needing to drive further to service the work.

5.18 Outside of London, smaller operators may benefit from the scheme by picking up good deals in the second hand vehicle market. However some discretionary trips (such as school outings and week-end breaks) may be potentially diverted to other less expensive locations.

6. MINIBUS MARKET SUMMARY

Introduction

6.1 There are four main categories of minibus operators:

- Community Workhorse: these minibuses are owned by social organisations for transport; and
- Business Own Use: these minibuses are owned by businesses and used to deliver the goods or services they provide.
- Vehicle rental: owners of minibuses lease their vehicles to businesses and individuals;
- Hire and Reward: operators provide passenger transport services for businesses and private groups.

6.2 In many cases these categories are likely to reflect the 'lifecycle' of the minibus, with minibuses often starting life for larger commercial / social organisations before being sold to smaller organisations.

Definition of vehicle types

6.3 For the purposes of this analysis, minibuses are defined as passenger vehicles with more than eight seats (excluding the driver) and weighing less than five tonnes. However, some of the sources we have consulted have pointed out that this definition includes less obvious vehicles such as long wheelbase Landrovers. The number of such vehicles is assumed to be minimal compared to the total population of minibuses.

The LEZ standard

6.4 Minibuses would be included in the scheme from October 2010, and all vehicles will have to meet Euro 3 standards for PM if they are to comply. In essence this means that unless they have been modified (or are early adopters of the Euro 3 standard), vehicles approximately eight years or older (i.e. built before 2002) would not be compliant with the new regulations.

Background Statistics

6.5 There are approximately 12,000 minibuses registered in London with a further 16,000 registered in the contiguous counties and unitary authorities. Approximately 40% of them are eight or more years old, and therefore likely to be non compliant. The research indicates that most of these will be owned by smaller businesses / individuals.

6.6 The density of minibuses registered in London is relatively low; however, there are high concentrations in some inner London Boroughs, in clusters around Heathrow airport, and around the M25.

FIGURE 6.1 MINIBUSES PER 1,000 POPULATION

Source: SDG elaboration Ordinance Survey base map

Market Sectors

6.7 Minibuses, as noted, fall into four 'operational' market sectors:

- Community Workhorse: these minibuses are owned by social organisations for transport; and
- Business Own Use: these minibuses are owned by businesses and used to deliver the goods or services they provide.
- Vehicle rental: owners of minibuses lease their vehicles to businesses and individuals;
- Hire and Reward: operators provide passenger transport services for businesses and private groups;

6.8 However, it is equally important to consider the types and nature of the organisations that are using them. It is the organisation type, its size, its culture, and how they use the vehicle that gives vital clues to how they view transport provision generally and how they will respond to this change in the regulatory framework.

6.9 The following matrix relates the outlines the four operational sectors to 'community' and three 'business / commercial' sectors.

TABLE 6.1 COMPLIANCE ISSUES BY SECTOR

	Community			Business / Commercial		
	Public Sector / Partners	**Community Network**		**Own Account**	**Hire & Reward**	**Rental Sector**
Community Workhorses	MOSTLY COMPLIANT	SOME IMPACTS		SOME IMPACTS	MOSTLY COMPLIANT	MOSTLY COMPLIANT
Business Own Use		SOME DUAL USE / NON COMPLIANT		A FEW IMPACTS	SOME IMPACTS	MOSTLY COMPLIANT
Hire and reward	MOSTLY COMPLIANT	MOSTLY COMPLIANT		SOME IMPACTS	MOSTLY COMPLIANT	MOSTLY COMPLIANT
Rental sector	MOSTLY COMPLIANT	MOSTLY COMPLIANT		BACK UP ONLY / MOSTLY COMPLIANT	BACK UP ONLY / MOSTLY COMPLIANT	MOSTLY COMPLIANT

Source: SDG assessment

Community

6.10 In terms of the vehicle usage, we estimate that approximately 17% of the minibuses can be described as 'community workhorses' with approximately 20% of them being non compliant. These will be concentrated across a broad range of smaller organisations. Their options will be to upgrade, replace, or hire vehicles / drivers as required.

6.11 Minibuses are a vital asset to a wide range of social organisations, including schools, faith groups, and voluntary groups.

6.12 The age profile is believed to be wide, with some vehicles being new whilst other organisations are likely to be operating far older vehicles. As a general rule the larger organisations (local authorities, community transport, churches) tend to operate newer (compliant) vehicles, while smaller voluntary groups tend to operate older (non-compliant) vehicles.

6.13 The impact of the proposed LEZ would vary accordingly, with voluntary organisations more likely to be affected by the scheme and having to make decisions on how to respond to it. This is likely to prove a

sensitive area, with a number of community organisations potentially incurring additional costs or losing their 'workhorse' sooner than expected. It should be stressed that this sector would not come within the scope of the LEZ until 2010, providing operators with three years from possible Scheme Order confirmation until implementation in which to develop compliance strategies. However, further information on this sector should be sought from the public and stakeholder consultation process and additional primary research is recommended prior to possible Scheme Order confirmation.

Business: Business Own Use / Own Account

6.14 This study indicates that approaching half of all the minibuses in London, and a slightly higher percentage in the contiguous counties fall into this category, and that between two thirds and three quarters of them would be likely to be non compliant. This equates to over 3,600 vehicles in London and over 5,000 in the contiguous counties.

6.15 Minibuses are believed to be a significant form of transportation in some sections of London's economy, including:

- Office cleaning;
- Hotel / Service Sector.

6.16 Given the wide diversity of businesses, it is likely that a range of options would be employed. There would of course be some re-deployment, but this will be constrained by the fact that many of the vehicles are operated by smaller businesses. We anticipate that most vehicles would be upgraded, either with a new, or newer, vehicle.

Business: Hire and Reward / Rental

6.17 Both these sectors would be likely to gain through an expanded market as some owners of older vehicles decide to switch to rental vehicles rather than investing in new, compliant vehicles.

6.18 There would be some impact on residual values; however the level of this impact of this is likely to be at least partially dependent on what happens in other parts of the country and the degree to which the second hand market for older minibuses holds up elsewhere in the UK.

6.19 It is believed that many of these vehicles, particularly those in 'operational' rather than customer facing roles, would be likely to be old and therefore non compliant. It is recommended that consideration be given to primary 'social' research to evaluate the impact of the zone on these economic sectors.

6.20 High levels of minibus concentration have been identified around West London. This is clearly a consequence of Heathrow airport and the support industries that surround it. We recommend that further consideration be given to work is undertaken prior to possible confirmation of the Scheme Order with a wide range of businesses (but particularly smaller service businesses) in this relatively discrete part of London, to assess the potential impact of the LEZ.

Vehicle rental

6.21 Minibuses are a significant element of the vehicle hire market.

6.22 Minibus drivers can be driven by most drivers (over 21) who have held a full driving licence for more than one year (or over 18 with a PSV) – providing it is NOT FOR HIRE OR REWARD (i.e. not commercial purposes).

6.23 The minibus hire market, however, appears to be dominated by modern vehicles. Therefore, this sector of the market is likely to be only minimally impacted by the proposed LEZ.

Hire and reward market

6.24 Minibuses form a significant section of the bus / coach and private hire / taxi businesses.

6.25 This market covers a wide range of vehicles. And whilst most are likely to be new vehicles, there is likely to be a small market segment using older vehicles towards the end of their life, particularly from outside London.

6.26 The impact of the proposed LEZ on this sector of the market is likely to be relatively small. Most operators are operating relatively new vehicles although there are likely to be some individual exceptions.

Sensitivity analysis

6.27 The data procured by TfL for the 'Comparison' scenario is prepared for the economic impact model in the same proportions per supply sector as above but with a total number of vehicles of some 12,000 and a constant 14% of operators who would choose to evade or pay the charge.

7. ANCILLARY MARKETS

Introduction

7.1 In addition to the providers and consumers of transport services, businesses and employees in the ancillary sectors would be likely to be affected by the proposed LEZ. These ancillary markets include:

- Maintenance, repair, and sales of parts and accessories;
- Used vehicle dealers;
- New vehicle dealers; and
- Vehicle leasing companies.

7.2 It is likely that all of the aforementioned businesses would benefit from the LEZ. In the remainder of this chapter, we examine how they could benefit from a LEZ, the likely magnitude of the gains, as well as the distribution of these benefits.

Maintenance, repair, and sales of parts and accessories

Sector background

7.3 The sector classified as Maintenance, repair, and sales of motor parts and accessories (SIC 50.2 and SIC 50.3) consists of 61,536 businesses in the UK (VAT and non-VAT registered). 11,629 (18.9%) of these businesses are in London and contiguous boroughs; 4,544 (7.4 % of UK total) are in Greater London[7].

7.4 The sector is characterised by a large proportion of non-VAT registered businesses (46%). While the number of small businesses in this sector is high, they constitute a small percentage of employment and industry turnover[8].

7.5 In general, the sector accounts for a bigger proportion of the regional economies outside of London (3% of business entities) than that of London (1.4% of business entities).

7.6 Of the businesses in this sector in the LEZ analysis area (GLA and contiguous counties/ unitary authorities), 96% are sites with an average of 4 employees. There are some businesses within the LEZ that are,

[7] Dun and Bradstreet data, 2006

[8] UK Business data and UK Small and Medium Enterprise data, ONS (accessed through NOMIS)

however, major employment and revenue centres[9].

7.7 National GVA from this sector is £13.9bn; sector GVA in the LEZ Area is £4.3bn[10].

7.8 We estimate that some 20,600 people work in this sector in Greater London.[11]

LEZ impacts

7.9 Businesses in the Maintenance, repair, and sales of motor parts and accessories sector would be likely to benefit from the LEZ as a result of increased demand for retrofitting, maintenance, and parts and accessories (e.g. particulate traps).

7.10 We assume that 50%[12] of the costs associated with vehicle retrofitting are retained by this sector in the UK. In addition, we assume that operators will choose to retrofit and maintain their vehicles close to where their vehicles are parked. Therefore, the benefits brought by the proposed LEZ would be likely to be realised by businesses in this sector all over the UK. The distribution of these impacts thus maps to the distribution of depot locations of the affected vehicles.

Used vehicle dealers

Sector background

7.11 The sector (SIC 50.102) consists of 4,908 used vehicle sales businesses in the UK; 273 (6%) of which are in London. The majority of these businesses, however, sell used cars and not commercial vehicles.

7.12 The top seven employers in this sector in Greater London employ a total of 210 people and are located in Bexley, Ealing, Tower Hamlets, Barnet, Islington and Greenwich[13].

7.13 National GVA from this sector is £1.9bn; sector GVA in the LEZ area is £0.6bn[14].

7.14 We estimate that the industry hires some 1,200 employees in London,

[9] Dun and Bradstreet data, 2006

[10] 2006 figures derived by SDG from Regional Sectoral GVA 2003 from Office for National Statistics.

[11] Based on SDG analysis on Dun and Bradstreet data, 2006

[12] Supplied by TfL, 2006

[13] Dun and Bradstreet data, 2006

[14] 2006 figures derived by SDG from Regional Sectoral GVA 2003 from Office for National Statistics.

3,200 employees in London and contiguous counties[15].

7.15 In order to further investigate the impact of the proposed LEZ scheme on the used vehicle sector, we contacted the vehicle auctioneers British Car Auctions. The main findings of the interview were as follows:

- The second hand markets deals in all types of vehicles including LGVs and HGVs of all ages from new to approximately 15 years old. The principal sellers include fleet operators leasing companies while the main buyers are dealers, traders and small owner/operators;
- The used vehicle market operates nationally i.e. the purchaser of a vehicle made available in the South East may well be from the North West; and
- In the LGV market there is little trading in petrol vehicles although smaller, car based vans are popular with small businesses.

7.16 The results of this engagement suggest that even if older vehicles become less desirable in the proposed LEZ area, there may still be a market for their resale further a field. This may partially mitigate the impact of the LEZ on resale values of non-compliant used vehicles. It also appears that the preference for car derived vans may increase amongst smaller businesses.

The LEZ impacts

7.17 Businesses in the used vehicle market are likely to benefit as there would be more churn in the market.

7.18 Sale prices of used vehicles would change because demand for compliant vehicles would increase, whereas demand for non-compliant vehicles would go down in the LEZ area.

7.19 This change in prices would result in owners of compliant vehicles benefiting from increased demand for their vehicles, whereas owners of non-compliant vehicles will face lower resale values of their vehicles. This effect may be mitigated in part by the national nature of the resale market and also the benefits for the purchaser of the availability of lower priced vehicles in areas with no scheme similar to the LEZ.

New vehicle dealers

Sector background

[15] Ibid

7.20 The new vehicle sales sector (SIC 50.101) includes both sales of cars and commercial vehicles. There are 12,988 new vehicle dealers in the UK. 2,144 (16.5%) of them are in Greater London and contiguous counties (776 in Greater London).

7.21 This sector represents a higher proportion of economic output in non-LEZ analysis areas (i.e. rest of UK) than in London and contiguous areas. National GVA from this sector is £6.8bn; sector GVA in the LEZ area is £2.1bn[16].

7.22 We estimate that the sector employs some 10,000 people in London, a further 36,000 in the contiguous counties.

The LEZ impacts

7.23 Dealers of new vehicles are also likely to benefit from the proposed LEZ in the short run due to accelerated replacement of new vehicles.

7.24 The effects that the proposed LEZ has on the new vehicle market are likely to be spread across the country. This is because a substantial proportion of vehicles that would travel in the LEZ are registered outside the Greater London and contiguous counties, and because new commercial vehicle dealers are more likely to be outside London and surrounding counties.

Vehicle leasing companies

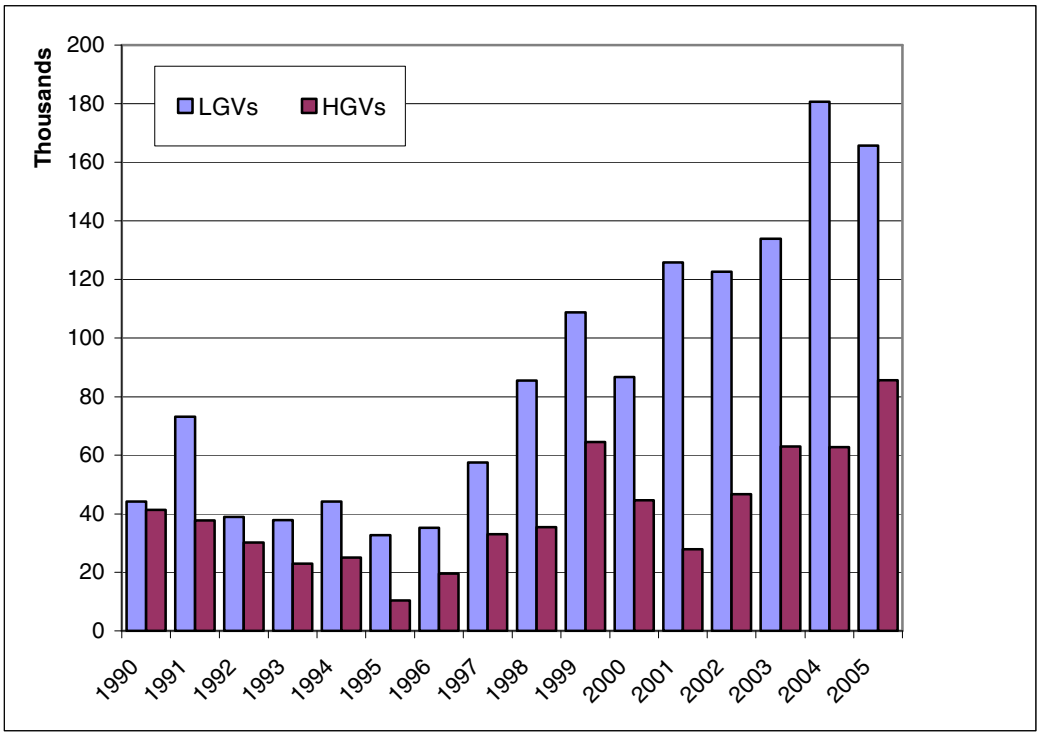
Sector background

7.25 The Renting of land transport equipment sector (SIC 71.2 and 71.3) consists of 1,415 companies that lease out passenger and freight vehicles. 119 of these businesses are located in London. We estimate that about 390,000 of the LGVs and HGVs on UK roads are leased.

7.26 The British Vehicle Rental and Leasing Association (BVRLA) is a membership body for vehicle rental, contract hire and fleet management companies. BVRLA members represent 65% of the commercial vehicle fleet in the UK. The following chart illustrates how the HGV (including coaches and buses) and LGV fleet sizes of BVRLA members have increased since the mid 1990s. In particular, the number of contract hired LGVs has grown substantially in the last decade.

[16] 2006 figures derived by SDG from Regional Sectoral GVA 2003 from Office for National Statistics.

FIGURE 7.1 FLEET SIZES OF BVRLA CONTRACT HIRE BUSINESSES



Source: BVRLA

7.27 This sector's major constituents are contract hire operators which lease vehicles on four- to six-year contracts. Other businesses include large HGV rental operators (e.g., TLS, Northgate, Ryders), who rent their vehicles for 7-14 days on average[17]. National GVA from this sector is £6bn; sector GVA in London is £2.6bn.

The LEZ impacts

7.28 This sector is likely to benefit from the proposed LEZ. Leasing companies constitute a majority of the UK demand for new commercial vehicles, and the contract hire sector consists primarily of new vehicles (maximum age of a rented or leased vehicle is 6 years[18]). Their consumers -- operators with newer, compliant, vehicles are likely to increase market share. The demand for leased vehicles is likely to grow because:

- Operators that currently lease their vehicles would increase market share and demand; and

[17] Engagement with British Vehicle Rental and Leasing Association representative, TfL, 22 April 2005

[18] Ibid

- Operators with currently non-compliant vehicles may choose to lease compliant vehicles rather than purchasing new vehicles.

Conclusions

Output and employment in ancillary sectors

7.29 We hypothesise that businesses in ancillary sectors would benefit from the proposed LEZ. The size of the benefits is derived from:

- The number of vehicles that are retrofitted/ upgraded;
- The number of used vehicles sold;
- The number of new vehicles sold;
- The number of operators that switch to leasing; and
- The growth in market share amongst contract hire operators.

7.30 The following table summarises the current sizes and nature of the ancillary sectors.

TABLE 7.1 ECONOMIC FOOTPRINT OF ANCILLARY SECTORS

Ancillary sector	GVA (million 2006 £s)		Employment ('000 FTE jobs)	
	UK	London and contiguous counties	UK	London and contiguous counties
Maintenance, repair, and sales of parts and accessories [SIC 50.2, 50.3]	14,000	4,300	280	90
Used vehicle dealers [SIC 50.102]	1,900	580	40	10
New vehicle dealers [SIC 50.101]	6,800	2,100	140	40
Vehicle leasing and rental companies [SIC 71.2, 71.3]	6,000	2,600	110	50

Source: 2006 figures derived by SDG from Regional Sectoral GVA 2003 from Office for National Statistics

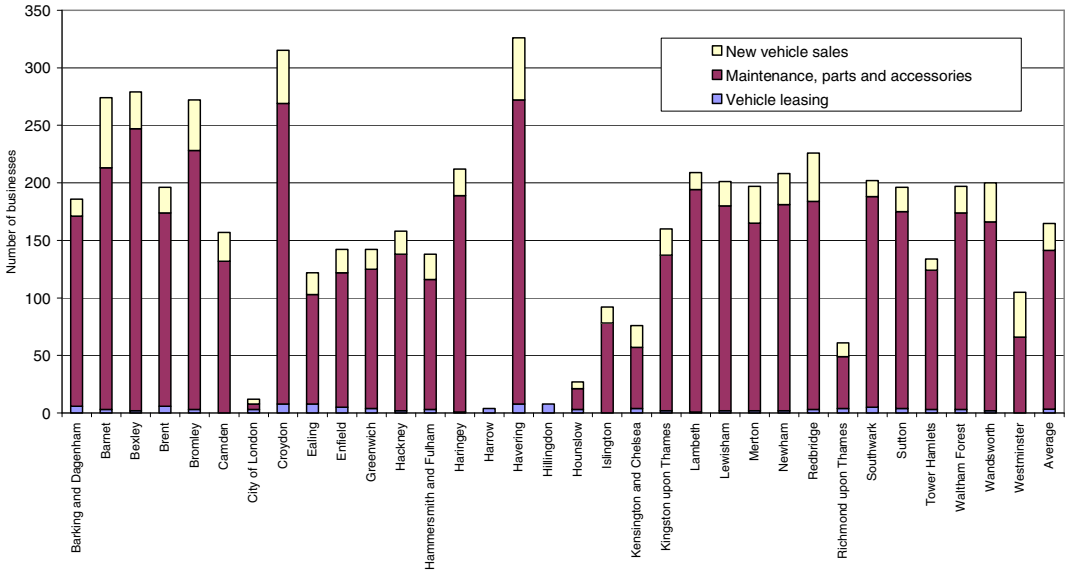
7.31 In addition to the ancillary sectors mentioned there, other businesses would be likely to benefit from the proposed LEZ include vehicle manufacturers, manufacturers of parts and accessories, and businesses that supply fuel. The current study does not explicitly model the benefits to these sectors; however, the GVA and employment impacts on these sectors would be included as indirect benefits estimated using economic multipliers.

7.32 On the other hand, some businesses that cater to commercial vehicles within the proposed LEZ area (e.g., depots, parking garages, and vehicle testing outlets) may suffer from a decrease in demand, as their customers with non-compliant vehicles will bear a higher cost. In these cases, businesses will face lower profit levels, and some may choose to close down or relocate. The number and nature of such businesses are beyond the scope of this EcIA.

Distribution of impacts in ancillary sectors

7.33 The following chart illustrates the presence of the ancillary sectors in the London boroughs. However it should be noted that it is anticipated that ancillary businesses from all over the UK, rather than just London and surrounding counties, would be impacted. Nevertheless, the following figure illustrates the presence of the ancillary sectors in the London Boroughs.

FIGURE 7.2 DISTRIBUTION OF ANCILLARY BUSINESSES IN LONDON BOROUGHS



Source: Dun and Bradstreet data, 2006

8. COSTS OF COMPLIANCE

Operator Cost Model

8.1 TfL has developed an Operator Cost Model that is used to estimate the costs of complying with the proposed LEZ standards through vehicle upgrades, retrofitting, and purchase. The model allows for different decision-making frameworks under which operators of non-compliant vehicles make their response decisions.

8.2 The study has defined inputs to the Operator Cost Model using our research into different types of vehicle operators. The model then provides estimates of average costs of compliance that in our view are potentially more representative of expected operator responses to the scheme.

8.3 Total costs have been developed by identifying the total number of vehicles from each operator segment likely to regularly operate within the proposed LEZ. These analyses have used vehicle registration data from the DVLA, responses to TfL 2006 TfL Operator Survey as well as reviews of operator consultations and desk research using information available from operator websites.

Direct costs: HGVs

8.4 The proposed LEZ would bring the replacement schedule forward for HGVs, and the operator types that are most affected are Small own transport operators (1- 25 vehicles), and the One-lorry hire-and-reward operators as they tend to have the oldest fleets[19].

8.5 Operators who choose to remain non-compliant would be faced with a LEZ charge of £200 a day. The annual additional cost this represents to the operator would depend on the frequency at which they travel to London. The 2006 TfL Operator Survey suggests that operators will decrease the number of trips they make to London; however, TfL may consider that the extent to which this takes place deserves further research before the Scheme Order is possibly confirmed.

8.6 In general, it is assumed that the larger the size of the fleet, the higher the bargaining power of the operator with respect to price negotiations with consumers of HGV services. It is therefore more likely that an operator with a large fleet can pass on LEZ-related costs completely to the consumers. It is also likely that large operators will have more flexibility as to the deployment of their fleet, which in itself is likely to be

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newer.

8.7 The consumers of HGV services fall into the following broad sectors:

- Agriculture (5%)
- Retail/ wholesale (49%)
- Construction (18%); and
- Manufacturing (29%)

8.8 Own account operators are assumed to be spread across these four sectors, whereas hire-and-reward operators are presumably all in the Road Transport sector.

Small own transport operators (1- 25 vehicles in fleet)

8.9 According to DVLA data, small own transport operators, including private HGV owners (e.g., horseboxes and recreational vehicles) have the oldest fleets. Own account operators that provide their own transport are likely to be tied to the location of their business (13% of their vehicle miles were reported by the LAEI to be run within the proposed LEZ area), and so are unlikely to be able to redeploy their fleet. As such, these operators would be some of the most affected should the LEZ come into effect in 2008.

8.10 From a review of the 2006 TfL Operator Survey we have estimated that up to 5% of these operators could "leave London" either through avoiding it, or going out of business.

8.11 These operators' behavioural responses to the proposed LEZ are modelled as follows:

TABLE 8.1 HGV: SMALL OWN TRANSPORT OPERATORS' RESPONSES TO LEZ (S1)

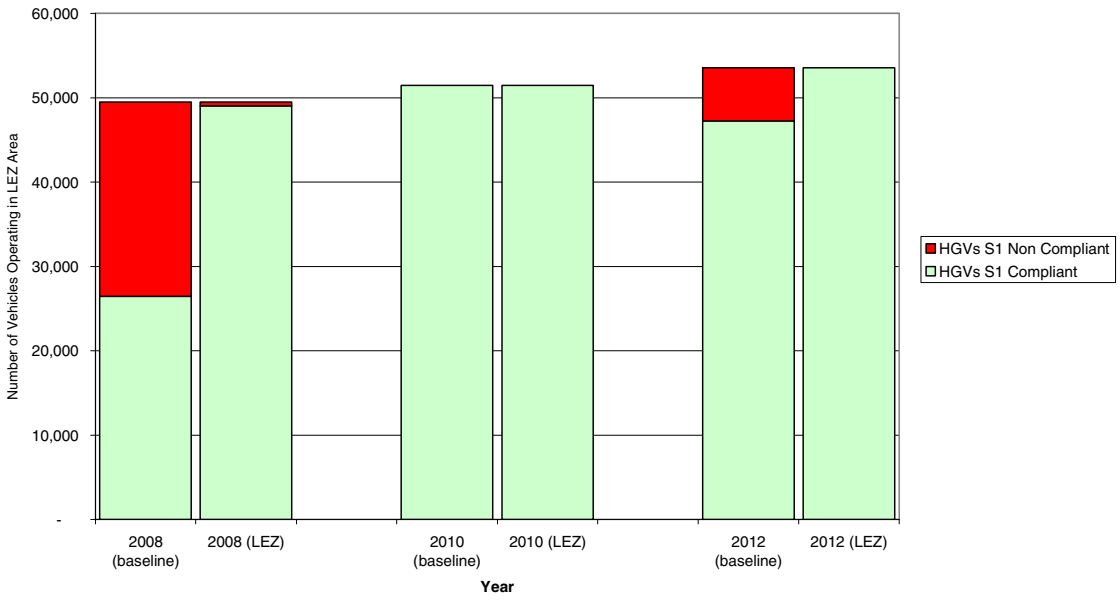
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	2%
(2) Replace with EIV vehicle	30%
(3) Replace with EIII+DPF vehicle	25%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	3%
(9) Retrofit with DPF only	40%
Average cost of compliance	£3,250 per vehicle

Source: TfL Operator Cost Model results

8.12 Based on the 2006 TfL Operator Survey, the percentage of vehicles in this group estimated to be non-compliant in 2008 is 47% (23,050), dropping to 1% by 2009. However, should the LEZ standard be raised to Euro 4 for PM in 2012, another 12% of vehicles in this group would again be non-compliant.

8.13 The average cost of compliance (excluding the option of evading the charge) is estimated to average around £3,500 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16). Operators who choose to remain non-compliant would be faced with a LEZ charge of £200 a day. The annual additional cost this represents to the operator would depend on the frequency at which they travel to London.

FIGURE 8.1 HGV: COMPLIANCE LEVELS BY SMALL OWN TRANSPORT OPERATOR (S1)



Source: SDG Analysis

Large own transport operators (>25 vehicles)

8.14 Large own transport operators are less likely to be affected by LEZ for a number of reasons:

- They are small in number (they represent only 3% of vehicles that enter the LEZ);
- The majority of their haulage activities are outside of the Greater London area; and
- They have relatively modern fleets.

8.15 These operators are in a position to re-arrange utilisation in order to use their newer vehicles for transport to, from and within the LEZ.

8.16 These operators' behavioural responses to the LEZ are modelled as follows:

TABLE 8.2 HGV: LARGE OWN TRANSPORT OPERATORS' RESPONSES TO LEZ (S2)

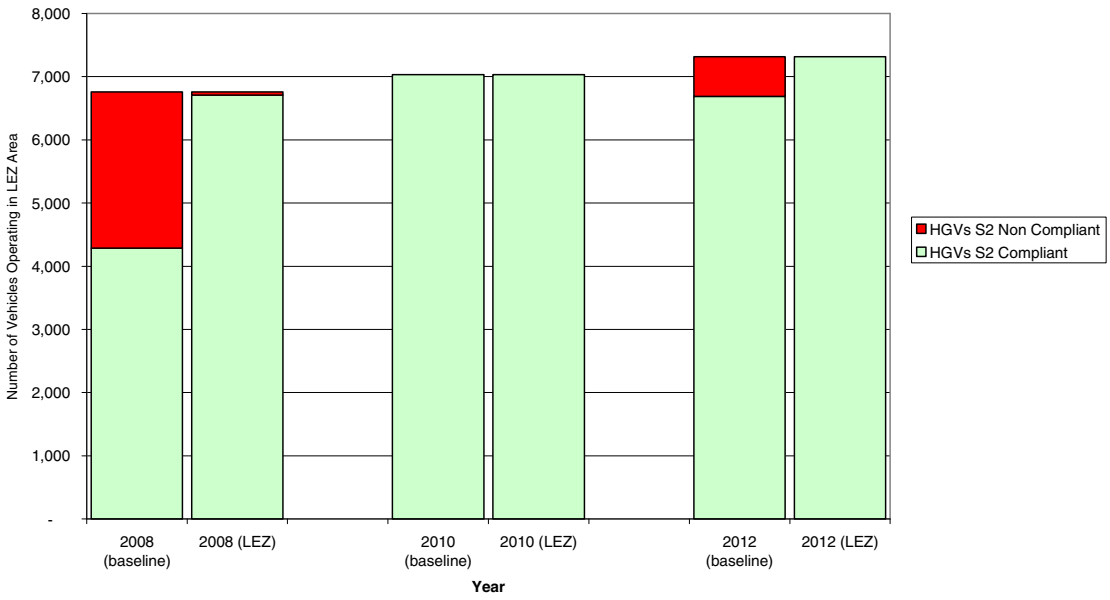
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	2%
(2) Replace with EIV vehicle	60%
(3) Replace with EIII+DPF vehicle	0%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	30%
(9) Retrofit with DPF only	8%
Average cost of compliance	£1,150 per vehicle

Source: TfL Operator Cost Model results

8.17 Based on the 2006 TfL Operator Survey, the percentage of vehicles in this group estimated to be non-compliant in 2008 is 37% (2,500), dropping to 1% by 2009. However, should the LEZ be raised to Euro IV for PM in 2012, approximately another 9% of vehicles in this group would again be non-compliant.

8.18 The average cost of compliance (excluding the option of evading charge) is estimated to average around £1,150 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16).

FIGURE 8.2 HGVS: COMPLIANCE LEVELS OF LARGE OWN TRANSPORT OPERATORS (S2)



Source: SDG Analysis

One-lorry hire/reward operator (1 vehicle)

8.19 Although relatively small in the total number of vehicles (5% of vehicles projected to enter the proposed LEZ), the LEZ could potentially have sizeable impacts on these operators because :

- They represent a relatively large number of vehicle operators (over 9,000);
- They tend to have older vehicles;
- These businesses have relatively small turnovers and are more cash-constrained than larger operators - LEZ costs therefore represent a higher proportion of their operating costs and;
- These operators do not typically have many alternatives, as they make their livelihood depends on the haulage of freight using one lorry; the majority of their haulage activities are outside of the Greater London area.

8.20 Based on the 2006 TfL Operator Survey, it is estimated that 10% of these operators could potentially leave London, either by going out of business, or having to participate in other markets. Their market share is likely to be taken on by existing hire-and-reward operators that have larger and newer fleets.

8.21 These operators' behavioural responses to the proposed LEZ are modelled as follows:

TABLE 8.3 HGV: ONE-LORRY HIRE-AND-REWARD OPERATORS' RESPONSES TO LEZ (S3)

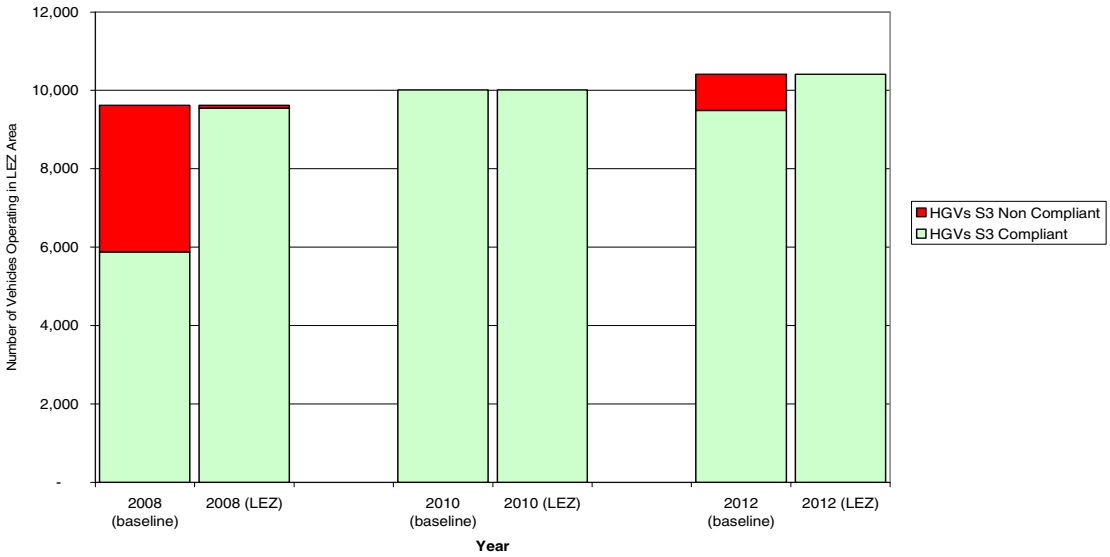
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	2%
(2) Replace with EIV vehicle	40%
(3) Replace with EIII+DPF vehicle	0%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	0%
(9) Retrofit with DPF only	58%
Average cost of compliance	£4,200per vehicle

Source: TfL Operator Cost Model results

8.22 Based on the 2006 TfL Operator Survey, the percentage of vehicles in this group estimated to be non-compliant in 2008 is 39% (3,700), dropping to 1% by 2009. However, should the LEZ be raised to Euro IV in 2012 for PM, approximately another 9% of vehicles in this group would again be non-compliant.

8.23 The average cost of compliance (excluding the option of evading the charge) is estimated to average around £4,200 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16).

FIGURE 8.3 HGVS: COMPLIANCE LEVELS OF ONE-LORRY OPERATORS (S3)



Source: SDG Analysis

Medium-sized hire-and-reward operators (2- 25 vehicles)

8.24 These operators would be projected to have the largest presence in the proposed LEZ (representing 35% of vehicle miles in the LEZ), and therefore represent the largest population of non-compliant vehicles. However, the bulk of their business activities take place outside of the proposed LEZ area (96%).

8.25 Based on the 2006 TfL Operator Survey, it is estimated that only up to 2% of these operators would leave London as a result of the proposed LEZ, either through relocation or going out of business.

8.26 These operators' behavioural responses to the LEZ are modelled as follows:

TABLE 8.4 HGV: MEDIUM-SIZED HIRE-AND-REWARD OPERATORS' RESPONSES TO LEZ (S4)

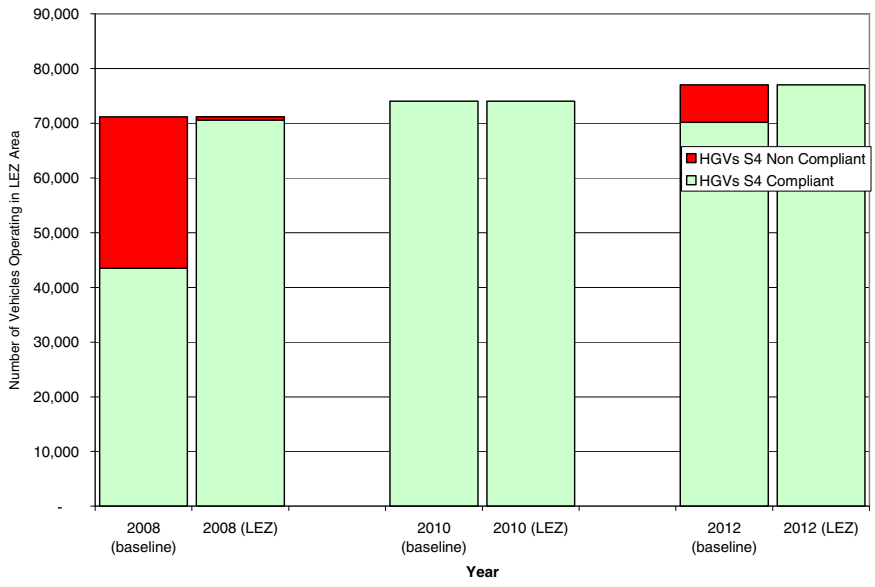
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	2%
(2) Replace with EIV vehicle	48%
(3) Replace with EIII+DPF vehicle	0%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	10%
(9) Retrofit with DPF only	40%
Average cost of compliance	£3,200 per vehicle

Source: TfL Operator Cost Model results

8.27 Based on the 2006 TfL Operator Survey, the percentage of vehicles in this group estimated to be non-compliant in 2008 would be 39% (27,700), dropping to 1% by 2009. However, should the LEZ be raised to Euro IV for PM in 2012, approximately another 9% of vehicles in this group would be non-compliant.

8.28 The average cost of compliance (excluding the option of evading charge) is estimated to average around £3,200 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16).

FIGURE 8.4 HGVS: COMPLIANCE LEVELS OF MEDIUM-SIZED HIRE-AND-REWARD OPERATORS (S4)



Source: SDG Analysis

Large hire-and-reward operators (> 25 vehicles)

8.29 These operators would be projected to have the second largest presence in the proposed LEZ (representing 32% of vehicle miles in the proposed LEZ; however, mileage within LEZ only represents a small proportion of the total activities amongst these haulage businesses (5%).

8.30 Although high in number, the proposed LEZ would be unlikely to represent substantial costs to these businesses because:

- The unit cost of compliance is relatively low for these operators, for they have relatively new vehicles in their fleet;
- They are likely to be based outside of London, while activities within London represent a relatively small proportion of their turnover, compared with operators with smaller fleets;
- There is more scope for redeployment of vehicles;
- They are large companies with sizeable turnovers, and are in a better position to both absorb and pass costs on; and
- Finally, they may gain market share as a result of smaller operators exiting the London market.

8.31 As these operations are capital-rich, we hypothesize that none of these operators would leave London as a result of the proposed LEZ, nor would they choose not to comply with it.

8.32 These operators' behavioural responses to the proposed LEZ are modelled as follows:

TABLE 8.5 HGV: LARGE HIRE-AND-REWARD OPERATORS' RESPONSES TO THE LEZ (S5)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with EIV vehicle	0%
(3) Replace with EIII+DPF vehicle	20%
(4) Re-engine, retrofit vehicle	16%
(8) Redeploy fleet	40%
(9) Retrofit with DPF only	24%
Average cost of compliance	£1,700 per vehicle

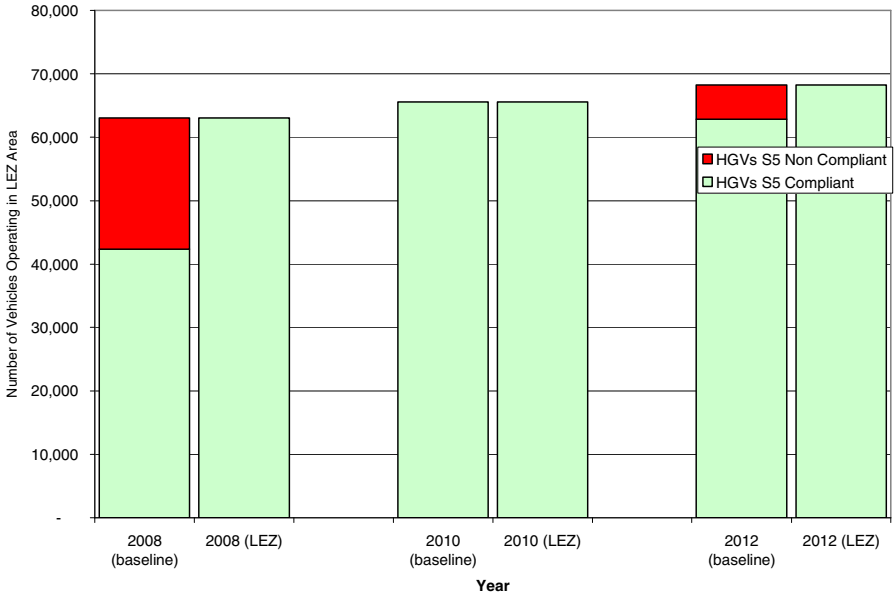
Source: TfL Operator Cost Model results

8.33 Based on the 2006 TfL Operator Survey, the percentage of vehicles in this group estimated to be non-compliant in 2008 is 33% (20,700). However, should the LEZ standard be raised to Euro IV for PM in 2012,

another 8% of vehicles in this group would again be non-compliant.

8.34 The average cost of compliance (excluding the option of evading charge) is estimated to average around £1,700 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16).

FIGURE 8.5 HGVS: COMPLIANCE LEVELS OF LARGE HIRE-AND-REWARD OPERATORS (S5)



Source: SDG Analysis

Conclusions

8.35 The total additional costs associated with LEZ compliance for all HGV operators are estimated to be up to £320m (PV, 2006/07- 2015/16) for the next 10 years. This figure refers to the costs directly associated with LEZ compliance and excludes costs operators would have incurred had the LEZ not existed.

8.36 These costs associated with the different operator types are presumed to be distributed in the market with operators assuming around 25% and the remaining 75% split across the demand sectors.

8.37 We presume, however, that all costs in the demand sectors will get passed down to the final consumers, namely households in the UK. Due to the nature of these sectors, however, we can assume that the costs will be spread all over the UK.

Direct costs: LGVs

8.38 Although it is relatively cheap and easy to replace or upgrade an LGV, the size of the population of LGV, compared to an HGV, bus or coach, operators in London would potentially result in this sector incurring a large proportion of the LEZ costs of compliance.

8.39 While the proposed LEZ could drive some businesses out of the London market, we assume that the demand for LGV transport would continue to grow. In line with current trends for increased LGV usage in London and contiguous counties. There would, however, be a re-distribution of market shares whereby less efficient and non-compliant operators would get replaced by more efficient and compliant ones. Data from the TfL 2006 TfL Operator Survey suggest that up to 4% of the LGV operators could potentially exit the London market.

8.40 Operators of LGVs can be companies or private individuals. In turn, these companies or individuals can be participants in the transport, or other sectors of the economy.

8.41 The consumers of LGV services fall into the following broad sectors:

- Services and passenger transport, sectors served include construction, plumbing and installation, telecom and financial services,
- Goods delivery, sectors served include construction, wholesale, retail, manufacturing, hotel and restaurants; and
- Public administration, providing government services and programs.

8.42 We generally assume that LGVs that provide a service are own account operators, for example a builder carrying tools to a worksite. LGVs that deliver goods are split between own account or hire-and-reward (transport sector) operators.

8.43 We assume that costs are passed on to the consumers of LGV operators' services. In other words it is the final consumer of the services (e.g. plumbing, construction, etc.) that pay the price.

Medium-large company operators (>11 vehicles)

8.44 These operators would have the largest presence in the LEZ (51% of vehicles in the proposed LEZ area), and travelling within the area constitutes a significant proportion of these operators' total vehicle mileage (71%).

8.45 Because these operators have relatively large fleets, we presume, based on the 2006 TfL Operator Survey, that 28% of them would

comply with the proposed LEZ standards by re-deploying their vehicles.

8.46 According to the results of the 2006 TfL Operator Survey, 4% of these vehicles would exit the London market either by operators going out of business, or by operators relocating their business activities and/ or avoiding London. We assume that in the long run, the market shares of exiting operators would be subsumed by existing operators, or new entrants to the market.

8.47 These operators' behavioural responses to the LEZ are modelled as follows:

TABLE 8.6 LGV: MEDIUM- LARGE COMPANY OPERATORS (S1)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	43%
(3) Replace with E3+DPF vehicle	29%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	28%
(9) Retrofit with DPF only	0%
Average cost of compliance	£1,650 per vehicle

Source: TfL Operator Cost Model results

8.48 Assuming the existing age profile for LGVs, approximately 8% of vehicles (4,400) in this group would be non-compliant in 2010 in a 'do-nothing' scenario.

8.49 The average cost of compliance (excluding the option of evading charge) is estimated at an average of £1,650 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16).

Small company operators (10 or fewer vehicles)

8.50 These operators operate a relatively small proportion of LGV vehicle miles in the Greater London area (4%).

8.51 Due to the low frequency of travel to, from and within London; of these vehicles, we hypothesise, based on the 2006 TfL Operator Survey, that some of these operators would respond to the proposed LEZ by paying the daily charge (1%) and some will redeploy their fleet so that only compliant vehicles would enter the LEZ (13%).

8.52 These operators' behavioural responses to LEZ are modelled as

follows:

TABLE 8.7 LGV: SMALL COMPANY OPERATORS (S2)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	1%
(2) Replace with E4 vehicle	14%
(3) Replace with E3+DPF vehicle	36%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	13%
(9) Retrofit with DPF only	36%
Average cost of compliance	£1,900 per vehicle

Source: TfL Operator Cost Model results

8.53 Assuming the existing age profile for LGVs, approximately 8% of vehicles (780) in this group would be non-compliant in 2010 in a 'do-nothing' scenario.

8.54 The average cost of compliance (excluding the option of evading charge) is estimated at an average of £1,900 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16).

Private operators

8.55 The proposed LEZ would be likely to represent significant costs to these businesses because:

- They tend to have older vehicles; They are likely to be based outside of London, while activities within London represent a relatively small proportion of their turnover, compared with operators with smaller fleets;
- They tend to have small fleets (often just one vehicle), which limits scope for redeployment;
- Many of these operators are local businesses that use LGVs for their own transport, and as such there is little scope for alternatives;
- The population of operators that are likely to be have non-compliant vehicles is relatively large, and a lot of them are based in London; and
- Finally, many of these operators are small businesses in the construction and service sectors. As such, we have assumed them likely to be cash constrained, and the cost of the LEZ may represent a higher proportion of their annual turnover than their counterparts.

8.56 These operators' behavioural responses to the LEZ are modelled as

follows:

TABLE 8.8 LGV: PRIVATE OPERATORS' RESPONSES TO LEZ (S3)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	1%
(2) Replace with E4 vehicle	16%
(3) Replace with E3+DPF vehicle	40%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	4%
(9) Retrofit with DPF only	40%
Average cost of compliance	£1,900 per vehicle

Source: TfL Operator Cost Model results

8.57 It is estimated that 33% of vehicles (44,300) in this group would be non-compliant in 2010 as private operators are likely to have smaller fleets; this number of vehicles is likely to correspond to a similarly large number of businesses. 99% of these affected vehicles would comply with the proposed the LEZ standards when they are implemented.

8.58 The average cost of compliance (excluding the option of evading charge) is estimated at an average of £1,900 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16), which is the highest cost of compliance amongst LGV operators.

Public sector operators

8.59 Public sector operators account for a small proportion of LGV operators, and they also have relatively new vehicles. The costs of the proposed LEZ on them would therefore be unlikely to be as large as those faced by the other operator types.

8.60 We have also made an assumption that the public sector is not cash constrained, and that they have the pressure to “lead by example”. We assume that the cost of compliance would be paid for by the local authorities that own, operate or contract hire the LGVs.

8.61 The public sector’s behavioural responses to the LEZ are modelled as follows:

TABLE 8.9 LGV: PUBLIC SECTOR OPERATORS' RESPONSES TO LEZ (S4)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	100%
(3) Replace with E3+DPF vehicle	40%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	0%
(9) Retrofit with DPF only	0%
Average cost of compliance	£1,850 per vehicle

Source: TfL Operator Cost Model results

8.62 Based on the 2006 TfL Operator Survey, it is estimated that 13% of vehicles (400) in this group would be non-compliant in 2010, and would be replaced by new Euro 4 vehicles.

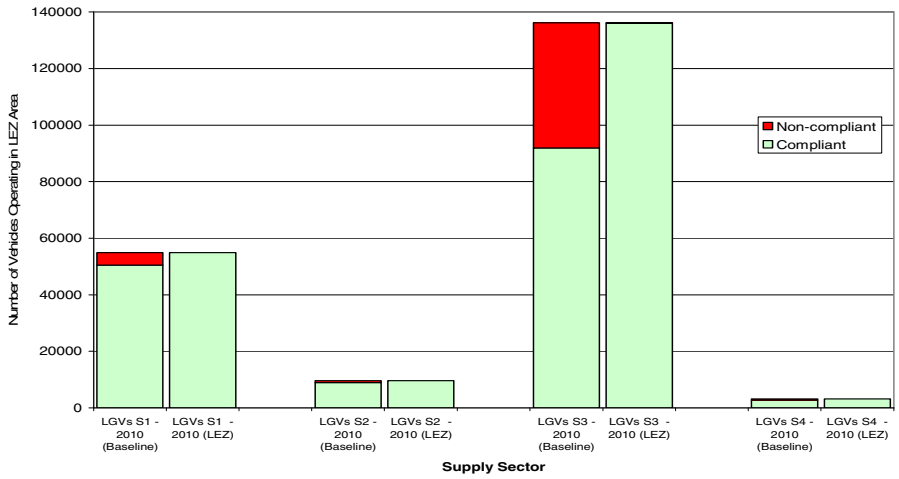
8.63 The average cost of compliance (excluding the option of evading charge) is estimated at an average of £1,850 per vehicle (present value in 2006 for costs incurred between 2006/07 and 2015/16).

Conclusions

8.64 The total additional costs associated with LEZ compliance for all LGV operators are estimated to be up to £75m (PV, 2006/07- 2015/16) for the next 10 years. This figure refers to the costs directly associated with LEZ compliance and excludes costs operators would have incurred had the LEZ not existed.

8.65 The LEZ would affect private operators to a greater extent than other types of operators as they have a larger proportion of non-compliant vehicles.

FIGURE 8.6 LGVS: COMPLIANCE LEVELS BY OPERATOR TYPE



Source: SDG Analysis

8.66 The costs associated with the different operator types are estimated to be distributed in the market with 60% assumed by operators and 40% across the consumer sectors.

8.67 We presume, however, that all costs in the demand sectors would get passed down to the final consumers, namely households in the UK. Unlike the HGV sector, however, we estimate that the majority of these costs would be paid for by households in the Greater London and surrounding areas, due to the propensity for LGV operators and businesses to serve local markets.

Direct costs: Coaches and buses

8.68 The LEZ would bring the replacement schedule forward for coaches and buses, and the operator types that would be most affected are the Old Niche operators.

8.69 All coach and bus operators are assumed to participate in the passenger transport market. As such all operators belong to the Land Transport sector.

8.70 Coaches and buses, however, serve a variety of passenger transport markets, each with unique demand characteristics:

- Chartered trips, serving UK and overseas tourists;
- Long term contract, serving schools and businesses (e.g. rail replacement service);
- Scheduled services, serving commuters on urban and inter-urban trips; and

- Community, serving schools, community organisations, and public bodies (e.g. police).

8.71 The extent to which passenger transport operators would be able to pass the LEZ-related costs to the consumer sectors depends on the price sensitivity of the sectors.

8.72 In some cases businesses may choose to exit the London market by going out of business or by serving new markets with their non-compliant vehicles. In markets that are competitive, however, we assume that market shares of exiting businesses will be absorbed by existing operators or new entrants.

Super operators (>80 vehicles in fleet)

8.73 Super operators have the largest market share in the provision of coach and bus services in the proposed LEZ area (35% of the LEZ coaches and buses) and have the most modern fleets.

8.74 As these operators tend to own relatively new vehicles and are likely to operate both inside and outside of the proposed LEZ area, there is scope for redeployment of fleet in order to comply with the proposed LEZ standards. 10% of operators would be assumed to comply by re-arranging the fleet, whereas none would choose to use their non-compliant vehicles and pay the daily charge.

8.75 These operators' projected behavioural responses to the LEZ are modelled as follows:

TABLE 8.10 COACHES: SUPER OPERATORS' RESPONSES TO LEZ (S1)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	35%
(3) Replace with E3+DPF vehicle	18%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	10%
(9) Retrofit with DPF only	37%
Average cost of compliance	£6,250 per vehicle

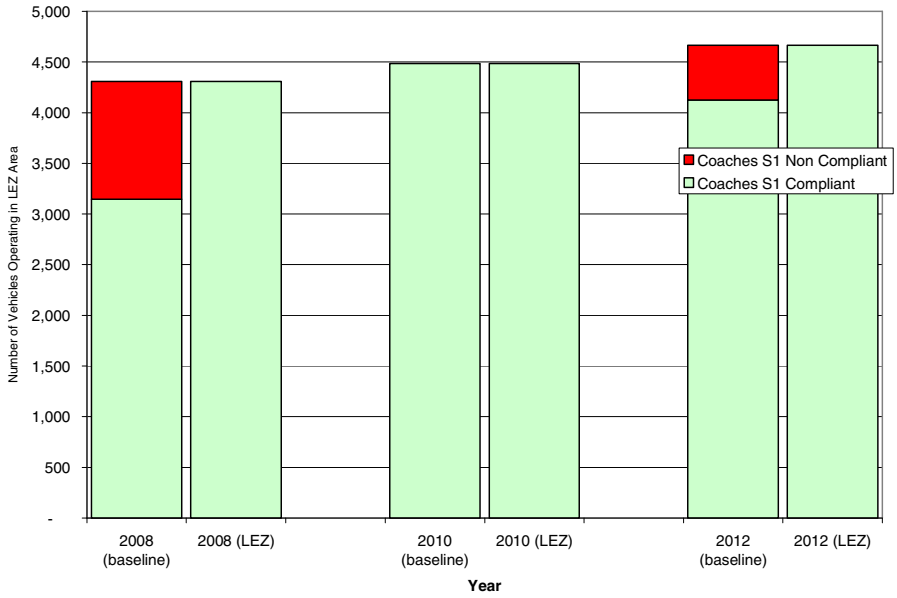
Source: TfL Operator Cost Model results

8.76 Approximately 27% of vehicles (1,200) in this group would be non-compliant in 2008, but 100% would be compliant were the LEZ to be implemented. When the LEZ standard is raised to Euro IV by 2012,

around 12% of coaches would again be non-compliant due to the more stringent 2012 emissions standard.

8.77 These operators would be least affected by the LEZ Scheme. The present value of the cost of compliance per vehicle (FY 2006/07-2015/16), at an estimated average of £6,250, would be the lowest amongst all the operator types.

FIGURE 8.7 COMPLIANCE LEVELS BY SUPER OPERATORS (COACHES AND BUSES)



Source: SDG Analysis

Niche operators with older vehicles (<20 vehicles in fleet)

8.78 Niche operators with older vehicles are operators serving a particular segment of the market whose fleets have an average age of over 10 years. They would be likely to be impacted by the proposed LEZ Scheme because:

- They currently have a large number of vehicles operating in the LEZ area;
- A high proportion of their vehicles will be non-compliant; and
- They rely on the London market for business.

8.79 Following our assumption that these operators tend to be cash-constrained, we hypothesize that some of them (30%) would choose to leave London at the implementation of the LEZ, either by closing down, or relocating, or serving markets outside of the LEZ area. There is also some scope for operators based outside of London to redeploy their

fleet to avoid London and it is estimated that 10% of operators would do so. This fleet redistribution would allow larger operators to move their older vehicles away from work in the proposed LEZ area.

8.80 These operators' behavioural projected responses to the LEZ are modelled as follows:

TABLE 8.11 COACHES: OLD NICHE OPERATORS' RESPONSES TO LEZ (S2)

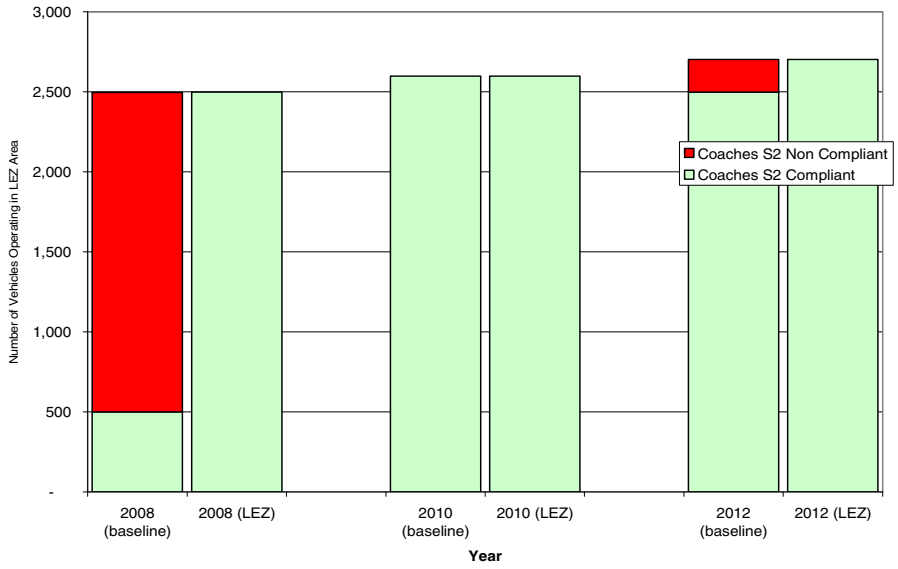
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	0%
(3) Replace with E3+DPF vehicle	0%
(4) Re-engine, retrofit vehicle	16%
(8) Redeploy fleet	10%
(9) Retrofit with DPF only	74%
Average cost of compliance	£7,700 per vehicle

Source: TfL Operator Cost Model results

8.81 Approximately 80% of vehicles (2,000) in this group would be non-compliant in 2008, but 100% would be compliant were the LEZ to be implemented. Were the LEZ standard to be raised to Euro 4 for PM in 2012, as is proposed, around 8% of coaches would again be non-compliant.

8.82 We estimate that the LEZ compliance cost per vehicle for this type of operators would average around £7,700 over the next 10 years.

FIGURE 8.8 COMPLIANCE LEVELS BY OLD NICHE OPERATORS (COACHES AND BUSES)



Source: SDG Analysis

Niche operators with younger vehicles (<20 vehicles in fleet)

8.83 Niche operators with younger vehicles have fleets with an average age of less than ten years. As these operators own mostly new vehicles that will be compliant in 2008, a relatively small number of vehicles from this market segment would be affected by the proposed LEZ.

8.84 According to TfL Operator Cost Model results, New niche operators would be less able to re-organise their fleets (15%) compared to their Old niche counterparts (30%); however, they would also be more willing to purchase new vehicles.

8.85 These operators' behavioural responses to the LEZ are modelled as follows:

TABLE 8.12 COACHES: YOUNG NICHE OPERATORS' RESPONSES TO LEZ (S3)

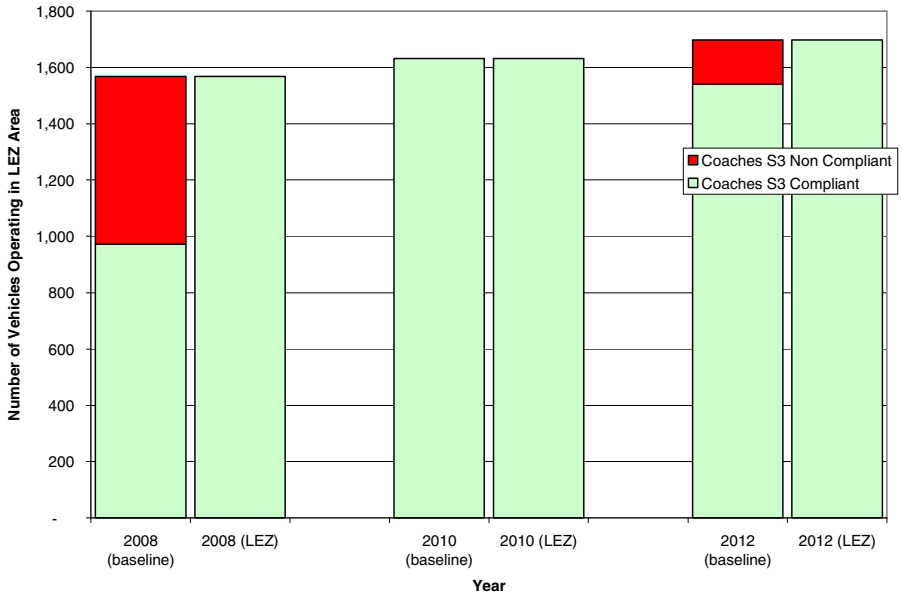
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	40%
(3) Replace with E3+DPF vehicle	0%
(4) Re-engine, retrofit vehicle	16%
(8) Redeploy fleet	15%
(9) Retrofit with DPF only	29%
Average cost of compliance	£9,500 per vehicle

Source: TfL Operator Cost Model results

8.86 Analysis of DVLA and LAEI data suggests approximately 38% of vehicles (600) in this group would be non-compliant in 2008, but 100% would be compliant when the LEZ is implemented. Were the LEZ standard to be raised to Euro 4 for PM by 2012, as is proposed, around 9% of coaches would again be non-compliant.

8.87 We estimate that the LEZ compliance cost per vehicle for this type of operators would average around £9,500 over the next 10 years, which would be the highest amongst the different types of coach and bus operators.

FIGURE 8.9 COMPLIANCE LEVELS BY YOUNG NICHE OPERATORS (COACHES AND BUSES)



Source: SDG Analysis

Mid range operators with younger vehicles (20-80 vehicles in fleet)

8.88 Mid range operators are more likely to be based outside of the London and surrounding counties; however, 21% of the coach and bus mileage (excluding London Buses) in London are supplied by these operators.

8.89 These operators represent a wide range of fleet profiles. We hypothesise, based on research including review of the 2006 TfL Operator Survey and stakeholder engagement, that 25% of operators would be able to re-deploy their fleets to avoid operating non-compliant vehicles within the proposed LEZ, and they are likely to value used and new vehicles equally.

8.90 These operators' behavioural responses to the proposed LEZ are modelled as follows:

TABLE 8.13 COACHES: MID RANGE OPERATORS' RESPONSES TO LEZ (S4)

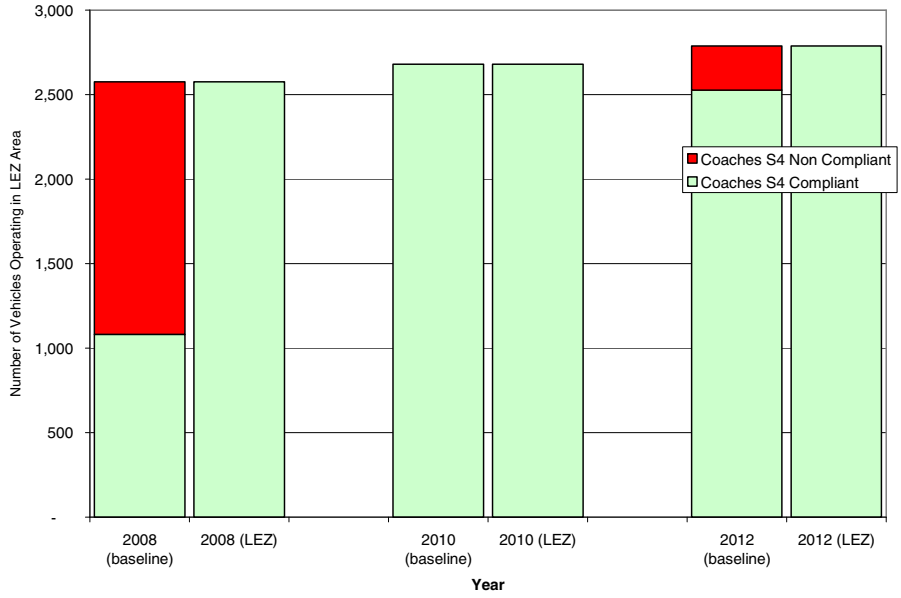
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	25%
(3) Replace with E3+DPF vehicle	0%
(4) Re-engine, retrofit vehicle	16%
(8) Redeploy fleet	25%
(9) Retrofit with DPF only	34%
Average cost of compliance	£7,900 per vehicle

Source: TfL Operator Cost Model results

8.91 Analysis of DVLA and LAEI data suggests approximately 58% of vehicles (1,500) in this group would be non-compliant in 2008, but that 100% of these vehicles would have been made compliant by the time the LEZ would to be implemented. Should the LEZ standard be raised to Euro 4 for PM in 2012, around 9% of coaches would again be non-compliant.

8.92 We estimate that the LEZ compliance cost per vehicle for this type of operators to average around £7,900 (present value) over the next 10 years.

FIGURE 8.10 COMPLIANCE LEVELS BY MID RANGE OPERATORS (COACHES AND BUSES)



Source: SDG Analysis

Local authority and community transport (20-80 vehicles in fleet)

8.93 Vehicles owned or leased by London boroughs and community transport operations based in London are relatively few in number. It is partly due to the increasing trend of contract hire, whereby community and school transport services are contracted out.

8.94 These operators are based in London, and they have no option but to comply (we assume that redeployment would not be an option). We also assume that the costs of compliance would be fully absorbed by government budgets.

8.95 These operators' behavioural responses to the LEZ are modelled as follows:

TABLE 8.14 COACHES: LOCAL GOVERNMENT AND COMMUNITY TRANSPORT OPERATORS' RESPONSES TO LEZ (S5)

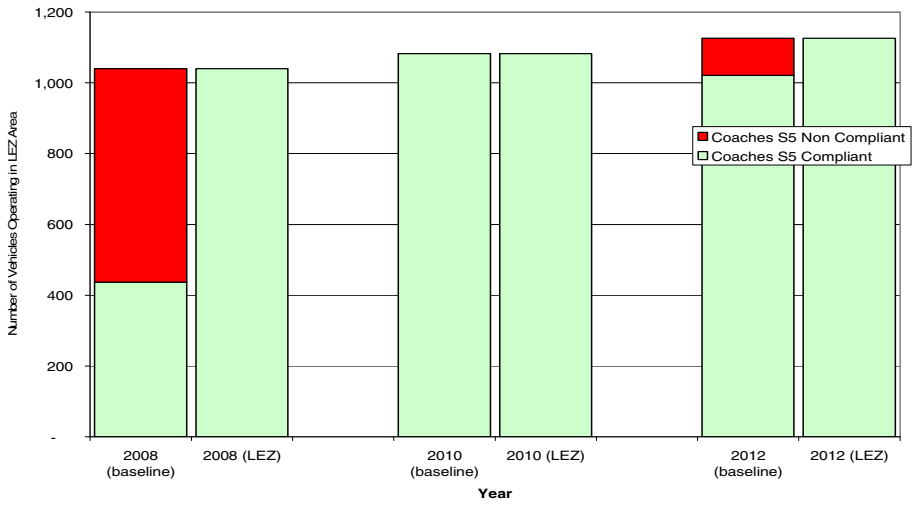
Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	25%
(3) Replace with E3+DPF vehicle	0%
(4) Re-engine, retrofit vehicle	31%
(8) Redeploy fleet	0%
(9) Retrofit with DPF only	44%
Average cost of compliance	£7,800 per vehicle

Source: TfL Operator Cost Model results

8.96 Approximately 58% of vehicles (800) in this group would be non-compliant in 2008, but 100% would be compliant were the LEZ to be implemented. Were the LEZ standard to be raised to Euro 4 for PM in 2012, as is proposed, around 9% of coaches would again be non-compliant.

8.97 We estimate that the LEZ compliance cost per vehicle for this type of operator would average around £7,800 over the next 10 years. It is worth noting that the Operator Cost Model suggests that Community transport vehicles are likely to incur lower compliance costs (around £5,700 per vehicle over the next 10 years).

FIGURE 8.11 COMPLIANCE LEVELS BY LOCAL AUTHORITY AND COMMUNITY TRANSPORT OPERATORS (COACHES AND BUSES)



Source: SDG Analysis

Conclusions

8.98 The total additional costs associated with LEZ compliance for all Coach and bus operators are estimated to be up to £65m (PV, 2006/07-2015/16) for the next 10 years. This figure refers to the costs directly associated with LEZ compliance and excludes costs operators would have incurred had the LEZ not existed. SDG analysis of the TfL Operator Cost Model output suggests that this figure would be shared approximately evenly between operators (supply) and consumers (demand).

8.99 It should be noted, that although some operators would manage to pass costs along to their consumers, the presence of alternatives in the passenger transport market (rail, car, etc.) means the consumers may consume less coach and bus transport as a result of higher prices. In simple terms people who currently travel by coach could find the increased price of coach travel now made rail or private car travel more attractive. However, this impact is likely to be minimal.

Direct costs: Minibuses

8.100 It should be noted that there is less data available for minibuses compared to the other vehicle types. Based on the data that is available and our own assumptions and analyses, the costs of compliance amongst minibus operators in the LEZ area are estimated to be low compared with other vehicle types.

8.101 It is likely that some segments of the minibus market could potentially be worse affected. These include community and voluntary organizations, which tend to have older fleet and have a lack of alternatives for transporting their people and constituents. This is an area where TfL may wish to consider further research prior to the Scheme Order potentially being confirmed.

Community workhorse

8.102 Community workhorses are used by community organisations and the voluntary sector to provide transport to their target group. They are a small proportion of the total minibus activity in the LEZ Area; however, they belong to organisations that span a wide spectrum in terms of activities, turnover, and vehicle profile.

8.103 We assume these organisations are likely to be cash-constrained.

8.104 We estimate these operators' behavioural responses to the LEZ as follows:

TABLE 8.15 MINIBUSES: COMMUNITY WORKHORSE OPERATORS' RESPONSES TO LEZ (S1)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	1%
(2) Replace with E4 vehicle	10%
(3) Replace with E3+DPF vehicle	9%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	0%
(9) Retrofit with DPF only	80%
Average cost of compliance	£2,300 per vehicle

Source: TfL Operator Cost Model results

8.105 Approximately 30% of vehicles (400) in this group would be non-compliant in 2010, assuming the continuation of the existing fleet age profile, but 99% of the operators would be expected to modify or replace their non-compliant vehicles upon the implementation of the LEZ.

8.106 We estimate that the LEZ compliance cost per vehicle for this type of operator would be around £2,300 over the next 10 years.

Business Own Use

8.107 Business Own Use are operated by businesses whose main business activity is not transport. They use their own vehicles to transport goods, workers or customers in order to provide their main product. It is to be expected that they would want to minimise their transport cost as it can directly affect their profits.

8.108 We therefore hypothesise that a relatively high proportion of these businesses may choose to pay or evade the daily charge (9%) or re-deploy their fleet (10%) as opposed to upgrading their vehicles. Furthermore, the frequency of travel by these operators in the proposed LEZ area may also decline as a result of the LEZ. These operators would absorb these LEZ-related costs and attach them to the price that they charge for their core business services.

8.109 Businesses' behavioural responses to the LEZ are modelled as follows:

TABLE 8.16 MINIBUSES: BUSINESS OWN USE OPERATORS' RESPONSES TO LEZ (S2)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	9%
(2) Replace with E4 vehicle	30%
(3) Replace with E3+DPF vehicle	30%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	10%
(9) Retrofit with DPF only	20%
Average cost of compliance	£1,400 per vehicle

Source: TfL Operator Cost Model results

8.110 Analysis of DVLA and LAEI data suggests approximately 84% of vehicles (2,700) in this group would be non-compliant in 2010 in the 'do-nothing' scenario. We estimate that the LEZ compliance cost per vehicle for this type of operators would be around £1,400 over the next ten years.

Hire and reward sector

8.111 Minibuses in the hire and reward sector are operated by passenger transport operators (Transport sector), and they provide transport services to businesses and individuals.

8.112 The trend towards outsourcing and contract hire has contributed to the current situation where this segment accounts for the greatest number of minibuses within the LEZ area out of all the identified segments.

8.113 Because these operators rely on their vehicles for their livelihood, we assume that they are more likely and willing to invest in new vehicles.

8.114 We model hire-and-reward operators' behavioural responses to the LEZ as follows:

TABLE 8.17 MINIBUSES: HIRE AND REWARD OPERATORS' RESPONSES TO THE LEZ (S3)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	70%
(3) Replace with E3+DPF vehicle	10%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	10%
(9) Retrofit with DPF only	10%
Average cost of compliance	£2,250 per vehicle

Source: TfL Operator Cost Model results

8.115 Approximately 32% of vehicles (1,400) in this group would be non-compliant in 2010 assuming a 'do-nothing' scenario based on the existing age profile. We estimate that the LEZ compliance cost per vehicle for this type of operators to be around £2,250 over the next 10 years.

Vehicle rental sector

8.116 Minibuses in the rental sector tend to be younger according to analysis of DVLA and LAEI data. The trend towards vehicle leasing means that these businesses (Vehicle leasing and rental sector) owning a considerable proportion (30%) of the minibuses that would be affected in the LEZ area.

8.117 These businesses tend to have big fleets along with greater access to investment funds than, for example, the community sector. As having compliant vehicles would increase their competitive advantage by servicing consumers travelling to or within the LEZ area, we hypothesise that the majority of these operators would respond to the LEZ by investing in new vehicles.

8.118 We model the rental sector's behavioural responses to the LEZ as follows:

TABLE 8.18 MINIBUSES: VEHICLE RENTAL SECTOR'S RESPONSES TO THE LEZ (S4)

Response	% of operators with non-compliant vehicles
(1) Evade/ pay charge	0%
(2) Replace with E4 vehicle	90%
(3) Replace with E3+DPF vehicle	10%
(4) Re-engine, retrofit vehicle	0%
(8) Redeploy fleet	0%
(9) Retrofit with DPF only	0%
Average cost of compliance	£2,500 per vehicle

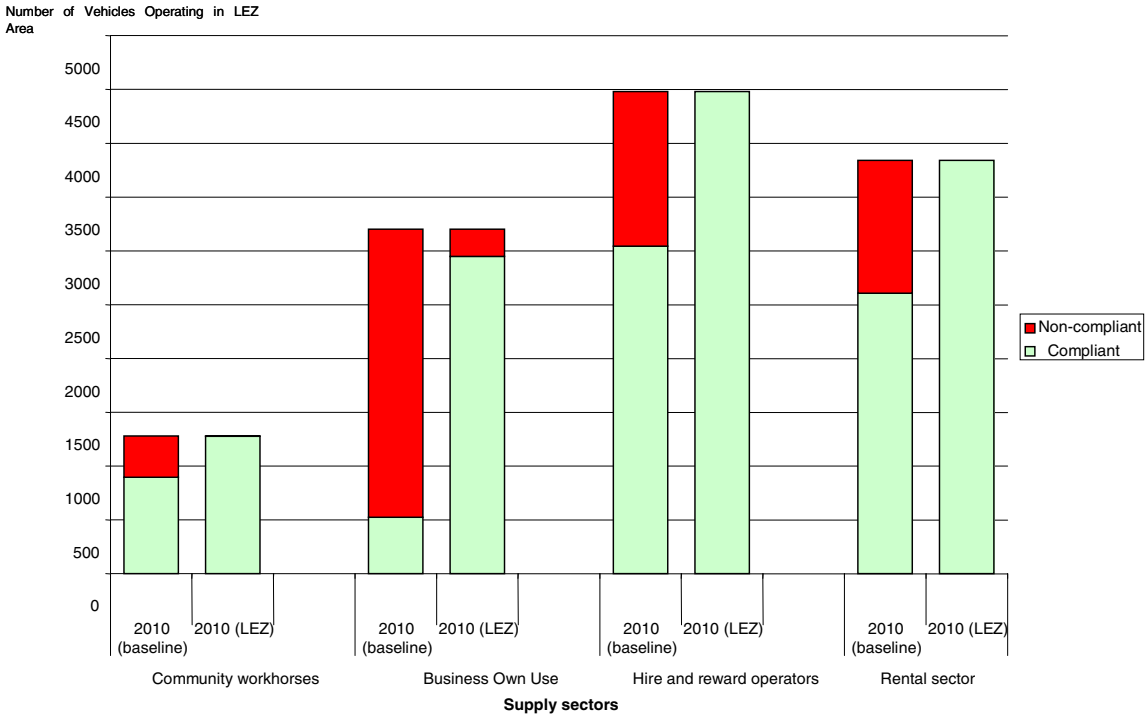
Source: TfL Operator Cost Model results

8.119 Approximately 32% of vehicles (1,200) in this group would be non-compliant in 2010, but it is expected that all of them would be replaced with Euro 4 or Euro 3 were the LEZ to be implemented. We estimate that the LEZ compliance cost per vehicle for this type of operators to be around £2,500 over the next ten years, the highest amongst the minibus owners and operators.

Conclusions

8.120 The total additional costs associated with LEZ compliance for all Minibus operators are estimated to be up to £17m (PV, 2006/07-2015/16) for the next 10 years. This figure refers to the costs directly associated with LEZ compliance and excludes costs operators would have incurred had the LEZ not existed.

FIGURE 8.12 MINIBUSES: COMPLIANCE LEVELS BY OPERATOR TYPE



Source: SDG Analysis

8.121 The costs associated with the different operator types are presumed to be distributed in the market with approximately 45% assumed by operators and the remainder (55%) across the demand segments:

8.122 We presume all costs in the community supply sectors would get passed down to the final consumers, in the main households in and around the LEZ area. For the other supply sectors we expect operators to absorb around 35% – 50% of compliance costs.

9. ECONOMIC AND BUSINESS IMPACTS

Direct impacts: supply and demand sectors

9.1 The analysis thus far has focussed on the cost implications of the proposed LEZ on vehicle operators and their customers. In order to estimate the economic impacts associated with the costs (in terms of GVA and employment change), we need to examine to what extent the supply sectors are able to absorb the costs (supply elasticity), and how the demand sectors would respond to changes in the cost of transport services and products.

Businesses/ operators that leave London

9.2 According to our analysis, up to 7,700 vehicles would leave London between 2006 and 2015 as a result of the LEZ, either by relocating, serving new markets, avoiding London, or going out of businesses The majority of these vehicles that would be expected to exit are HGVs (2,400 vehicles) and LGVs (4,700 vehicles). Furthermore, these vehicles tend to be owned/ operated by two types of operators:

- Small own transport HGV operators (1,500 vehicles); and
- Private LGV operators (4,400 vehicles).

9.3 The small own transport HGV operators consist of private individuals with HGVs (with one vehicle), and businesses that have more than one vehicle where transport is not the service they provide, but rather part of how they deliver their product. The exit of private own transport HGVs from the LEZ area should represent no direct employment change, as these vehicles would be replaced by contracted haulage as transport. However, own account business operators that choose to exit would potentially represent a decrease in employment and business output in the LEZ area.

9.4 Private LGV operators participate in a variety of sectors, and many are in construction (47% of vehicle km). These are predominantly local businesses (as evident by the short distances travelled per average trip).

9.5 Apart from private owners of single HGVs that are not used for commercial purposes, market shares of businesses and operators that leave the London market(s) are presumed to be replaced by existing businesses or new businesses in the long run. As such, we expect it to be unlikely that any net employment impact will arise from business relocation.

9.6 However, the nature of the employment may change. As evident from

the results of our analysis, private operators and businesses with small fleets bear relatively higher costs of compliance, and would be more likely to choose to leave London. We hypothesise that there will be further consolidation in the freight haulage markets, whereby operators with larger fleets are likely to increase their market shares. For businesses that are not in the transport sector, there may be a trend towards leasing or contract hiring vehicles in order to mitigate the costs of vehicle upgrades. In this case of a market shift towards contract hire and leasing/ rental businesses, it is expected these sectors would experience a rise in both output and employment.

Parties that absorb costs

9.7 Although the LEZ will have its most direct impact on the supply sectors as they react to the implementation of the LEZ, it is also important to analyse the associated effects on the sectors that require transport services to provide their products or services.

9.8 The following table summarises these different supply and demand sectors that are anticipated to experience costs associated with LEZ compliance. It should be noted that the table provides high and low cost projections based on the 'High Cost' and 'Low Cost' scenarios described earlier in the report. A brief outline of these scenarios is also re-presented below.

- *High Cost Scenario*
  - Estimates of vehicles operating within the LEZ based on higher end of the ranges from the transport impacts of the LEZ feasibility study and cross-checked DVLA and 2006 TfL Operator Survey results.
  - High compliance with scheme: 95-100% operators with non-compliant vehicles choosing compliance options that reduce emissions in London rather than pay (or evade) the charge.
  - Assumption that operators passing costs onto customers will increase prices so as to cover the costs of compliance over a shorter five year period.
  - Assumption that only half expected short term increases in employment in vehicles sales and maintenance sectors are sustained in the longer term.
- *Low cost scenario*
  - Estimates of vehicles operating within the LEZ based on mid range of estimates from the transport impacts of the LEZ pre-feasibility study.
  - Low compliance with scheme: 86% operators with non-compliant vehicles choosing compliance options that reduce emissions in London rather than pay (or evade) the charge.

- Assumption that operators passing costs onto customers will increase prices so as to cover the costs of compliance over the full ten year evaluation period of the scheme.
- Assumption that all short term increases in employment in vehicles sales and maintenance sectors are sustained in the longer term.

TABLE 9.1 SECTORS AFFECTED BY THE LEZ

	Direct LEZ cost burden (PV £m 2006- 2015)[20]		GVA/ income/ spending 2005 (in 2006 £m)		Direct LEZ cost as % of PV GVA/ income/ spending			
	Scenario				Low Cost		High Cost	
Sector	Low Cost	High Cost	UK	Greater London and SE England	UK	Greater London and SE England	UK	Greater L and SE E
Agriculture, forestry & fishing	4	5	11,000	1,200	0.00%	0.04%	0.01%	0.05
Construction	29	42	67,000	19,000	0.01%	0.02%	0.01%	0.03
Hotels and Restaurants	1	3	36,000	12,000	0.00%	0.00%	0.00%	0.00
Manufacturing	23	32	160,000	34,000	0.00%	0.01%	0.00%	0.01
Other services	3.3	5	57,000	23,000	0.00%	0.00%	0.00%	0.00
Public Admin, Education, Health & Social Work	2	7	190,000	51,000	0.00%	0.00%	0.00%	0.00
Real estate, renting and business activities	1	1	263,000	110,000	0.00%	0.00%	0.00%	0.00
Transport, Storage & Communication	92	140	86,000	32,000	0.01%	0.03%	0.02%	0.05
Wholesale, Retail	39	56	130,000	42,000	0.00%	0.01%	0.01%	0.02
Coach tourists	1.2	1.7	1,900[22]	290[23]	0.03%	0.05%	0.04%	0.07
Commuters	1.4	2	n/a	52[24]	n/a	0.32%	n/a	0.47
Households	110	180	820,000	250,000	0.00%	0.01%	0.00%	0.01
Grand Total	300	470	1,100,000	340,000	0.00%	0.01%	0.01%	0.02

Source: 2006 GVA figures derived by SDG from Regional Sectoral GVA 2003 from Office for National Statistics, adjusted by RPI figures., London Coach Tourism Study (London Development Agency, 2004), Coach Industry Prospectus (Confederation of Passenger Transport UK)

[20] Rounded to two significant figures.

[21] This assumes GVA/ spending/ income levels remain constant between 2006 and 2015. In reality GVA may rise which would render our LEZ Cost as % of PV GVA Income/Spending an overestimate.

[22] Confederation of Passenger Transport UK (CPT) estimates.

[23] Estimate from London Coach Tourism study.

[24] Estimate of total spending on commuting by coach to London by assuming: 5% of Old niche and 10% New niche vehicles serve the commuter market; average fare per commute per day is £8, an average of 100 commuters are transported by each coach each day, 250 days a yea.

9.9 The sectors of the economy whose GVA is estimated to experience the greatest percentage impact in London and surrounding area are Transport and storage, Construction sectors and commuters to and from London.

9.10 The impact on Transport and storage sector is as would be expected due to the large proportion of affected vehicles that are operated in the sector and also as the competition within the sector is so that smaller operators, who tend to have to accept the standard market price for services, would have to absorb the costs associated with the LEZ. This is associated with an estimated reduction of GVA from that sector (estimated at between £90m and £140 million over ten years). It is possible that some operators may leave the market as profit margins become too low; however, the haulage market is assumed to be so competitive that any market share left by exiting operators would be immediately filled up. We estimate there to be a net reduction in FTE employment of approximately 240 to 430 over ten years once redistribution of driving and hauling jobs from less efficient operators to more efficient ones is taken into account.

9.11 The potential LEZ impact on the Construction sector has two major components:

- The first is the costs that HGV operators pass on to their customers in the Construction sector (52% of compliance costs according to our analysis); and
- The second is the costs borne by LGV private owner-operators who are in the construction business (42%).

9.12 In the first case, owners of non-compliant vehicles within Construction sector pass the costs on to the final consumers i.e. sectors of the economy that are served by the Construction sector. This can be any business and household. If we assume that the Construction sector only serves the London and surrounding areas, the LEZ costs only represent a small proportion (0.004%) of GVA and household income in the analysis area. We therefore estimate a very small employment impact as a result of the pass through of the costs of compliance.

9.13 In the second case, it is likely that some small Construction businesses in the London area would suffer losses in the short run. Privately-owned LGVs in the Construction sector tend to belong to small Construction enterprises (52%). There is also evidence that a majority (79%) of Construction businesses in the UK are not VAT-registered. Construction businesses with fewer than five employees constituted 96.1% of businesses, 53.6% of employees, and 34.4% of total UK industry turnover. The average turnover for a Construction business with none to four employees in the UK was £82,000 in 2005 (ABI, Small

Business Survey data, Office for National Statistics, UK Business 2006 Rounded Data). As such, the costs associated with LEZ compliance would constitute a large proportion of these businesses' cash flows. As these businesses are small, they are likely to participate in competitive markets and be price-takers. Some may potentially be forced to exit the market, as the LEZ costs erode their operating margins. According to the TfL Operator Survey results, this equates to up to 2,100 privately owned LGVs in the construction sector to exit the London market. Assuming that each vehicle corresponds to one construction business, and each business hires an average of 2.5 FTE employees, that would equate to a loss of up to 4,000 FTE jobs in the construction sector in the short run.

9.14 However, as we have assumed that the demand for construction services in the market remains unchanged, the market shares of the exiting businesses would be taken on by existing or new entrants. Assuming that productivity of labour does not change, there would be a redistribution of up to 4,000 FTE jobs back into the Construction industry, albeit hired by different companies.

9.15 Coach tourists are likely to incur some of the costs associated with coach compliance. There are two possible ways in which tourists could choose to respond:

- They would substitute their trips to London by something else; or
- They would continue with the same travel patterns and budget, but would make up for the increase in transport cost by spending less on other sectors (e.g. hotels and restaurants).

9.16 Given the very small proportional increase in the generalised cost of an average coach holiday to London (0.07%), it is highly likely that tourists would continue to visit London. This is some evidence provided by some coach operators to LEZ consultations which indicates that some lower value local trips (such as school trips to London) may be diverted elsewhere.

9.17 We would further assume that the costs of the LEZ would get passed on from the coach operators to the tourists, and then from the tourists to other tourist-serving sectors, such as restaurants, hotels and entertainment. It is highly likely, however, that the percentage increase in generalised costs to coach tourists are so small that they would fail to notice the change, and the charge is ultimately absorbed by the coach tourists/ households from all over the UK and abroad.

9.18 We estimate through our analysis that Commuters between London and surrounding counties would absorb between £1.4m and £2m

(present value) of the LEZ related costs in the next 10 years as compliance costs are passed on to the consumer and also as prices may further rise to cover a fall in demand caused by the initial price increase. The commuter demand segment is presented with ready substitutes. It is possible demand could decrease as a result of the increase in commuter coach fares. If we assumed an own demand elasticity of -0.57[25], then demand for scheduled coach services would decrease by 0.27%. Assuming that this decreased demand would directly impact the output levels of coach operators, this would be equivalent to a loss of approximately £140,000 (0.003%) in revenue per year amongst all affected operators. We judge that at this magnitude there would be unlikely to be any noticeable employment impacts.

Direct impacts: ancillary markets

9.19 As demonstrated by the anticipated responses by different operator types in the 2006 TfL Operator Survey, it is possible that the proposed LEZ would speed up the replacement rate of vehicles, and would also generate short-term demand for businesses that cater to selling, retrofitting, and maintaining parts and accessories.

9.20 An indication of the demand created in these ancillary sectors is as follows:

TABLE 9.2 INDICATIVE BENEFITS OF THE LEZ TO THE ANCILLARY SECTORS

Vehicle type	Capex outlay for new vehicle (£)	Capex outlay for used vehicle (£)	Retrofit with DPF (£)	Re-engine vehicle (£)
HGVs	54,750	31,165	3,250	20,000
LGV	15,000	10,250	1,500	
Coaches	147,500	122,500	3,500	20,000
Minibuses	15,000	10,250	1,500	

Source: Capex and Opex data from Operator Cost Model, received on October 24, 2006.

9.21 The Operator Cost Model makes the following assumptions in order to provide the data required to quantify the benefits to the ancillary sectors as follows:

- For every purchase of a new vehicle, it is assumed that the new vehicle dealers yield 8% of the capex outlay paid by the operator;

[25] *The Demand for Public Transport*, TRL Report 2004. P. 221 Own elasticity for inter-urban bus commuting travel with the South East.

- For every purchase of a used vehicle, it is assumed that the used vehicle dealers yield 8% of the capex outlay paid by the operator; and
- It is assumed that every Pound spent on retrofit, maintenance and repair is equal to an additional 50 Pence in output from the maintenance, repair, and sales of parts and accessories (SIC 50.2 and SIC 50.3)

9.22 The SDG economic impact model was used to calculate the impact on the vehicle sales and maintenance, repair and sales of parts and accessories sectors. The resultant increase (for 'High Cost' and 'Low Cost' scenarios) in GVA and FTE employment impacts on the ancillary sectors are estimated as follows:

TABLE 9.3 DIRECT IMPACTS ON ANCILLARY SECTORS

Sector	UK GVA (£m)	UK Employment (FTE jobs)	Direct Impact on GVA PV £m (% change)		Direct Employment impact (FTE jobs)	
			Low Cost	High Cost	Low Cost	High Cost
Maintenance, repair, and sales of parts and accessories	14,000	280,000	90 (0.08%)	140 (0.12%)	220	340
Vehicle sales (new and used)	23,000	180,000	130 (0.03%)	220 (0.06%)	120	200

Source: Office for National Statistics Employment and GVA figures adjusted to 2006, SDG analysis.

9.23 Leasing companies are also likely beneficiaries of the proposed LEZ. The demand for leased vehicles is likely to grow because

- Operators that currently lease their vehicles would increase market share and demand; and
- Operators with currently non-compliant vehicles may choose to lease compliant vehicles rather than purchasing new vehicles.

9.24 At this point, however, it is difficult to estimate how many operators would switch to leasing, and whether the leasing supply would be filled by the additional purchase of vehicles by London and surrounding leasing companies, or by leasing companies from other parts of the country (redeployment).

9.25 In addition to the ancillary sectors mentioned there, other businesses that are likely to benefit from the LEZ include vehicle manufacturers and manufacturers of parts and accessories. The current study does not explicitly model the benefits to these sectors; however, the GVA and employment impacts on these sectors would be included as indirect benefits estimated using economic multipliers.

9.26 On the other hand, some businesses that cater to commercial vehicles within the LEZ area (e.g., depots, parking garages, and vehicle testing outlets) may experience a decrease in demand, as their customers who have non-compliant vehicles would incur higher cost and therefore either reduce operations or cut back on spending. In these cases, businesses would potentially face lower profit levels, and some may choose to close down or relocate their businesses. The number and nature of such businesses are beyond the scope of this EcIA.

Direct impacts: Summary

9.27 The following table is a summary of the magnitude of direct impacts of the LEZ for the High Cost and Low Cost scenarios on the different sectors, as well as their geographical distribution (in present value, 2006/07 – 2015/16). The High Cost scenario impacts are of a greater magnitude than the Low Cost as they are based on a greater assumed number of vehicles being made compliant which is directly proportional to the positive impact on the ancillary sectors. This distinction between scenarios is also the driver behind the greater estimated High Cost total GVA and employment impacts.

TABLE 9.4 DIRECT IMPACTS OF THE LEZ: SUMMARY[26]

	Direct LEZ impact (PV £ms)		Direct UK GVA impact		Direct Employment impact (FTE jobs)	
	Low Cost	High Cost	Low Cost	High Cost	Low Cost	High Cost
Total Negative Impact (Supply and Demand Sectors)	(300)	(470)	0.028%	0.045%	(460)	(710)
Total Benefits (Ancillary Sectors)	220	360	0.021%	0.034%	340	540
Total	**(80)**	**(110)**	**0.008%**	**0.010%**	**(120)**	**(170)**

Source: SDG analysis

Wider economic impacts

9.28 Wider economic impacts refer to the indirect and induced impacts arising from the direct impacts of the LEZ. On the basis of the data and evidence we have access to, we rely on UK Type II multipliers from the 1995 input-output tables for the indirect and induced GVA and employment impacts.

[26] Rounded to two significant figures.

TABLE 9.5 TYPE II MULTIPLIERS FROM UK INPUT-OUTPUT TABLES (1995)

Sector	GVA multiplier	Employment multiplier
Agriculture, forestry & fishing	2.13	2.99
Construction	2.09	2.50
Hotels and Restaurants	1.71	1.49
Manufacturing	1.82	1.96
Other services (SIC 90,91,92,93,95)	1.55	1.95
Public Admin, Education, Health & Social Work	1.62	2.00
Real estate, renting and business activities	1.57	1.63
Transport, Storage & Communication	1.78	1.76
Wholesale, Retail	1.75	1.64
Coach tourists	1.7 [27]	
Commuters	0.52[28]	n/a
Households	0.52	n/a
Maintenance, repair, and sales of parts and accessories	1.71	1.57
Vehicle sales (new and used)	1.71	1.57

Source: United Kingdom Input-Output Analyses, 1995 Analytical Tables. Office of National Statistics, May 2002; Scottish Input-Output tables 2003

9.29 Using national input-output multipliers for regional economic impacts tends to over-estimate the magnitude of indirect and induced impacts for a number of reasons. The most important of which are:

- National multipliers tend to be larger, since the larger the geographical coverage, the less likely that there is "leakage" in the economy;
- The multipliers are derived from a "static" snapshot of the economy, namely the input-output table. They not take into account excess capacity in the sectors, whereby extra output does not necessarily translate into additional employment, etc.

9.30 We therefore adjust the national multipliers by taking a 30% discount in order to estimate the indirect and induced impacts of predominantly

[27] Estimated based on multipliers for sectors likely to be associated with tourism.

[28] Estimated based on Household Output-Income multipliers, Scottish Input-Output tables 2003

localised effects.

9.31 In summary, table 9.6 estimates the direct negative economic impact of the LEZ to be in the region of £300m - £470m. Once the positive beneficial impact on ancillary sectors is included in this estimation, the overall direct economic impact falls to a figure around £80m - £110m. It is important to note that this is purely an estimation of the direct economic impact and does not measure the potential health benefits. This value is estimated in the Health Impact Assessment.

TABLE 9.6 TOTAL IMPACTS OF THE LEZ: SUMMARY[29]

		Scenario	
		Low Cost	High Cost
Direct LEZ impact (PV £m)	Cost	(300)	(470)
	Benefit	220	360
	Net Impact	**(80)**	**(110)**
Total UK GVA impacts (PV direct, indirect and induced impacts)	Cost	(380)	(720)
	Benefit	280	450
	Net Impact	**(100)**	**(270)**
Total Employment impact (FTE 2006 - 2015)	Cost	(570)	(1100)
	Benefit	430	680
	Net Impact	**(140)**	**(420)**

Source: SDG analysis

9.32 Considering the Low Cost and High Cost scenarios, the overall sum of the direct, indirect and induced impacts of the LEZ on all sectors are estimated to be some £100m PV to £270m PV[30], with a total net loss of some 140 to 420 FTE jobs.

Conclusion and discussion

Affected sectors

9.33 Small, own transport operators are anticipated to be the most affected by the proposed LEZ.

9.34 Some small Construction businesses in London would be likely to exit the market through relocation or going out of business; however, the market is competitive and their shares would be absorbed by existing businesses or new entrants.

[29] Rounded to two significant figures.

[30] The value of money changes over time due to inflation. PV (Present Value) is a standard method of using a discount rate to present future costs, payments, or receipts at today's prices. In other words it can be used to compare different values from different dates in the future in a standard manner. The annual discount rate assumed for this report is 3.5%.

9.35 Coach tourists and commuters would also be likely to be affected. Our review of how coach operators providing long distance scheduled commuter services into London suggests that many of these businesses may seek to pass on some of the costs of compliance for their fleet as fares increases in markets where there is not significant competition with rail.

9.36 UK households would incur the bulk of the costs that get passed down, through higher transport or product prices. These costs, however, would be likely to be spread out over a large area and spending base (beyond London and surrounding counties), and as such constitute a negligible proportion of household spending over the evaluation period (2006/07- 2015/16).

9.37 The LEZ compliance cost burden that would be incurred by private HGV operators would not be anticipated to lead to any employment losses. It is possible that London-based businesses that cater to these operators (e.g. horse shows for private individuals with horse-boxes) may experience reduced demand, as the generalised cost of travelling to London would increase as a result of the LEZ. TfL should consider measures to encourage these sectors to participate in the forthcoming public and stakeholder consultation in order to better understand the impact of the proposed LEZ on sectors such as these prior to possible Scheme Order confirmation.

9.38 Ancillary sectors would be likely beneficiaries of the proposed LEZ, as the LEZ would lead to increased churn in the vehicle sales markets, as well as increased demand for vehicle parts, accessories, and retrofitting services.

9.39 Taking the ancillary sectors into account, the net direct and indirect cost of the LEZ is significantly lower than the direct cost, in the region of some £100m – £270m PV over the 10 years of the evaluation.

9.40 The sensitivity analysis provides a way to account for the uncertainty in the assumptions about predictions in the number of vehicles affected, the way owners of non-compliant vehicles would respond and how costs would be passed through the economy over time. The analysis indicates a wide range for the negative impacts on the economy between the estimates in the Low Cost scenario (£380m) and High Cost scenario (£720m) a difference of £340m. However, the overall net costs (where the both costs and benefits of the scheme are taken into account) are less sensitive to changes in assumptions with a difference of £170m between estimates from the Low Cost and High Cost scenarios.

9.41 The Low Cost scenario indicates lower negative effects on GVA and employment to the economy as a result of assumptions about lower numbers of vehicles affected and lower costs of compliance which are recovered from customers over a longer period. However, in the Low Cost scenario the same assumptions also result in less benefit as fewer vehicles are replaced or upgraded as a result of the LEZ.

Distributional impacts

9.42 The greatest impacts of the LEZ are distributional:

- Moving freight haulage and passenger transport towards greater consolidation, and dominance of large operators with newer vehicles;
- Movement away from own-account operations to contract hire and leased vehicles; and
- Re-distribution of regional GVA from certain sectors (e.g., construction and transport) to others (e.g., vehicle sales and repairs and maintenance);

10. MANAGEMENT AND MITIGATION OF IMPACTS

10.1 The Economic and Business Impact Assessment indicates that the impact of the introduction of the LEZ on the majority of larger businesses and individuals that operate vans, trucks and buses would not be significant. The analyses in this report have demonstrated that larger companies tend to have younger fleets, are more able to re-organise the location of their fleets so that non-compliant vehicles can avoid the LEZ, and would be more able to accommodate the cash flow implications of accelerating the replacement of older vehicles.

10.2 These organisations would be well placed to manage the effects of the scheme on their businesses, and any mitigation measures implemented by TfL would be unlikely to produce a more efficient management response.

Smaller businesses

10.3 The businesses and individuals potentially most affected would be the smaller and marginal operators (for all the four vehicle types identified). Many of these are owner-operators where the management of the vehicle fleet may be only one small aspect of running their business. Many of these operators would be unlikely to have formulated 'fleet management strategies' and may not have either the awareness, skills or funding to develop an efficient response to the scheme. These smaller businesses:

- May be less aware of their best options to manage the costs of compliance (i.e. they would not necessarily know whether their business would be better off fitting a filter or replacing their vehicles);
- May not plan sufficiently far ahead, and as a result may need to pay higher costs for making more of their fleet compliant in a shorter time span; and
- May not be able to finance the cash flow requirements of the vehicle replacement process, i.e. buying a compliant vehicle and selling an older vehicle.

10.4 TfL may also wish to consider the need to find out more information about the sectors that would be worst affected by the proposed LEZ prior to a decision on Scheme Order confirmation. The public and stakeholder consultation on the Scheme Order provides an opportunity to engage with these sectors.

10.5 TfL could also seek to ensure that information is made widely available on the requirements and implications of the policy, and more detailed advice is provided in a format that is readily understandable by people

in small businesses, the public sector and the voluntary sector in making decisions about the best way to manage their fleet.

Support for technology development and process improvement

10.6 The cost assumptions in this Economic Impact Assessment are based on inputs from TfL's Operator Cost Model that indicates older vehicles, even with engines originally manufactured previous to the introduction of Euro emissions standards, would generally be able to be made compliant with the scheme by fitting a particulate trap.

Support for cases of social use of vehicles

10.7 There are many organisations in the community transport sector that use their bus/minibus as more than a means of transport. For example, such vehicles may also be used for storage of equipment and play items or have been specifically adapted by users for special purposes.

10.8 For the social use group (school, community group etc), the analysis further suggests that, if this additional cost for reconfiguration of a new vehicle cannot be met, the group might, in extreme cases, be forced to give up the use of the vehicle – and thus reduce the range of activities it might provide.

10.9 TfL should consider the need to find out more information on how the LEZ would affect these sectors prior to a decision being taken on Scheme Order confirmation.

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11. MONITORING AND EVALUATION

11.1 On the basis of our analysis, we would consider that – to the extent that it were possible – the parameters for monitoring should focus on:

- Success of the scheme
- The costs of compliance
- Changes in transport prices which are consequent on the introduction of the policy;
- Changes of employment levels (within key areas of London and the UK) in the transport industry; and
- Changes in the numbers of vehicles operated by the voluntary and community sector.

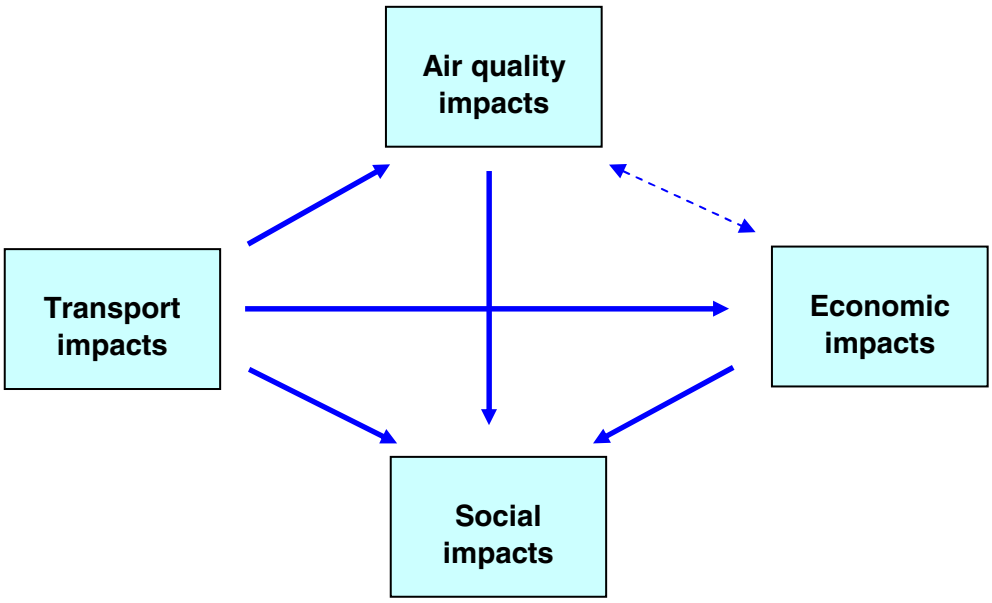
11.2 The changes likely to occur as a result of the proposed LEZ might well be masked by other changes following from other macro-economic and socio demographic factors.

11.3 The LEZ could have impacts at various "levels" from the micro (individual businesses and people) to the "macro" (London as a whole). It could also impact different aspects of London life, namely:

- Environment / air quality
- Economy / business / employment
- Transport
- Social

11.4 It is therefore useful to define a monitoring framework which reflects the overall objectives and priorities of the LEZ. Given that the primary aim of the LEZ would be to reduce emissions and thereby improve air quality, the environmental monitoring should be at the top of the "tree". Although the transport impacts may not be important as outcomes of the LEZ, they will be important as inputs to monitoring of the environmental and economic impacts because they are relatively quantifiable and measurable. The economic and social impacts can be regarded as secondary, unintended outcomes of the LEZ. Thus, a strategic overview of a LEZ monitoring programme could be visualised like this:

FIGURE 11.1 THE LEZ STRATEGIC OVERVIEW FRAMEWORK



Source: SDG assessment

11.5 The link between the transport and air quality impacts is relatively straightforward and measurable (volume of vehicles on the roads within each emission standard), and can be converted into the overall volume of emissions. In theory, this can be validated using air quality monitoring, though in practice this may not be possible.

11.6 The link between transport and the economy is less clear and complicated by the fact that transport costs have a relatively minor impact on the economy as a whole, and on business performance (other than for transport businesses). However, by breaking down the transport impacts by market sectors (HGVs, LGVs, Coaches and buses, Minibuses) it is possible to identify parts of the economy which would be most affected.

11.7 The social impacts are the least susceptible to quantification, but could be monitored through surveys that focus on specific sectors such as community and voluntary vehicles. The monitoring could include whether any market is lost as a result of operators leaving the market, thus depriving users of the service.

Role of data sources

11.8 Within the monitoring programme the role of different types of data sources and within this, different individual sources needs to be determined. This means assessing sources in relation to their:

- Coverage
- Accuracy / reliability

- Availability

11.9 In overall terms, it will be important to base the monitoring on a solid foundation, then to use other sources to supplement this base to provide more detail on specific aspects or market sectors. Bearing in mind the availability of data, this foundation is likely to be predominantly transport-related (numbers of vehicles by type and by emissions standards), which can be obtained from observed data.

11.10 For monitoring the economic impacts, a key issue is disaggregation: statistics on employment, GVA, business closures, business performance etc. can be misleading because the LEZ would be a relatively minor influence. Breakdowns by industry sector can help somewhat, but ultimately some attitudinal survey data will be needed to identify the role of the LEZ in relation to other influences.

11.11 The models that are available will play an important role in directing the survey activity: one approach would be to use the models to predict the impacts then to use surveys to validate (or calibrate) these predictions. Thus, the surveys would not be used directly to establish the impacts but would be used to help the models make better predictions.

11.12 The actual cost of compliance post implementation of LEZ, should it be confirmed, should also be monitored so that any difference between the assumed costs, used for Economic and Business Impact Assessment, and those actually incurred can be observed and if necessary review and adjust any relevant mitigating measures.