



Ultra Low Emission Zone Integrated Impact Assessment


Economic and Business Impact Assessment

October 2014

Document control sheet

BPP 04 F8
version July 2014

Project:	Ultra Low Emission Zone Integrated Impact Assessment		
Client:	Transport for London	Project Number:	B1993000
Document Title:	Economic and Business Impact Assessment		
Ref. No:	N/A		

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1.1 Overview

1.1.1 Transport for London (TfL) commissioned Jacobs to undertake an Integrated Impact Assessment (IIA) of the proposed Ultra Low Emission Zone (ULEZ).

1.1.2 The ULEZ is a proposal to reduce emissions specifically from road transport. The following objectives for ULEZ were proposed in line with the characteristics set out in the Mayor’s Transport Strategy 2010 (MTS):

- *reduce air pollutant emissions from road transport, particularly those with greatest health impacts, to support Mayoral strategies and contribute to achieving compliance with European Union (EU) limit values;*
- *reduce carbon dioxide (CO₂) emissions from road transport, to support Mayoral strategies and contribute to a London-wide reduction; and*
- *promote sustainable travel and stimulate the low emission vehicle (LEV) economy by increasing the proportion of LEVs in London.*

1.1.3 The IIA considers and documents the findings of the following individual assessments in relation to ULEZ to provide a streamlined and integrated overview of the anticipated impacts of the ULEZ:

- *Environmental Assessment (EA);*
- *Health Impact Assessment (HIA);*
- *Equality Impact Assessment (EqIA); and*
- *Economic and Business Impact Assessment (EBIA).*

1.1.4 This report is the EBIA and should be read in conjunction with its sister documents and the overarching IIA report.

1.2 Purpose of this report

1.2.1 This report details the findings of the assessment undertaken on economic and business impacts relating to implementation of the ULEZ. The findings of the assessment will be integrated into the IIA and used to support consultation with a range of stakeholders. This report identifies measures which could be used to help manage, mitigate or enhance identified impacts.

1.3 Scope of the EBIA

1.3.1 The MTS IIA objectives and criteria were used to develop IIA topics and objectives for assessing the impacts of the proposed ULEZ. All IIA topics and corresponding objectives are identified in Table 1-A.

1.3.2 The economic and business impacts assessed relate to the two IIA objectives highlighted in Table 1-A. This report assesses the extent to which the ULEZ achieves these two objectives.

IIA topic	IIA objective
Air quality	To contribute to a reduction in air pollutant emissions and compliance with EU limit values
Noise	To reduce disturbance from general traffic noise
Climate change	To reduce CO ₂ emissions and contribute to the mitigation of climate change
Biodiversity including flora and fauna	To protect and enhance the natural environment, including biodiversity, flora and fauna
Cultural heritage	To protect and enhance the historic, archaeological and socio-cultural environment
Water	To protect and enhance riverscapes and waterways through planning and operation
Material resources and waste	To promote more sustainable resource use and waste management
Landscape, townscape and urban realm	To protect and enhance the built environment and streetscape
Health and well being	To contribute to enhanced health and wellbeing for all within London
Population and equality	To enhance equality and social inclusion
London's economic competitiveness	Provide an environment that will help to attract and retain internationally mobile businesses
Small and Medium Sized Enterprises (SMEs)	Support the growth and creation of SMEs

Table 1-A ULEZ IIA objectives (ULEZ topics addressed by the EBIA highlighted in grey)

1.3.3 The assessment against these two objectives has been undertaken by vehicle type by examining the impact that the proposed ULEZ may have on vehicle use, on relevant economic sectors and on SMEs. This approach is broken down in Table 1-B.

Topic	Within scope	Out of scope
London's economic competitiveness	Those sectors within the proposed ULEZ that have a significant dependence on road transport such as construction, retail and the evening economy	Most sectors of the economy such as financial and business services which have little dependency on road transport to operate successfully
SMEs	SMEs providing niche services that are dependent on road transport	SMEs in sectors such as financial and business services that have little dependency on road transport to operate successfully

Table 1-B Scope of the EBIA

1.4 Structure of this report

1.4.1 The report is structured as follows:

- *Chapter 2 provides background information on the proposed ULEZ;*
- *Chapter 3 provides details of the proposed ULEZ including a description of the ULEZ study area;*
- *Chapter 4 provides a description of the relevant legislation and policy applicable to the EBIA;*
- *Chapter 5 provides an overview of the information sources, guidance and approach used in completion of the EBIA;*
- *Chapter 6 outlines anticipated changes in traffic volumes and flows associated with implementation of the ULEZ;*
- *Chapter 7 completes the assessment to identify the potential economic impacts on businesses using the vehicles affected by the proposed ULEZ; and*
- *Chapter 8 summarises the key findings from the EBIA and how the proposed ULEZ meets each relevant IIA objective.*

2 Background

- 2.1.1 Whilst the Low Emission Zone (LEZ), introduced in 2008, and other Mayoral policies have improved air quality in Greater London, the challenge remains to meet the specified air quality limits set by the EU. Air pollution affects the quality of life of a large number of Londoners, especially those with respiratory and cardiovascular conditions. In 2008, an equivalent of 4,300 deaths in the Capital were attributed to long-term exposure to fine particulate matter (PM_{2.5}) and a permanent reduction of 1µg/m³ would increase life expectancy across the population, with the expected gains differing by age (Miller, B. G., 2010).
- 2.1.2 A number of strategies published by the Greater London Authority (GLA) including the Mayor's Air Quality Strategy 2010 (MAQS) and the MTS aim to reduce emissions to mitigate climate change and improve London's air quality. Since the publication of the MTS, TfL has delivered a greener bus fleet, encouraged the use of electric cars and increased public transport patronage, alongside cycling and walking.
- 2.1.3 TfL's Transport Emissions Roadmap 2014 (TERM) builds on this by focussing on reducing emissions from ground-based transport in London. The TERM introduces a range of proposed measures to be considered by various parties to help meet the challenge of reducing CO₂ emissions and air pollutants, particularly oxides of nitrogen (NO_x), nitrogen dioxide (NO₂) and particulate matter (PM₁₀), in London. Implementation of the ULEZ in central London is one of the measures identified.

3 Details of the Proposed ULEZ

3.1 Overview

3.1.1 The ULEZ would require all vehicles driving in central London to meet new exhaust emission standards (ULEZ standards). The ULEZ would take effect from 7 September 2020, and apply 24 hours a day, 7 days a week. A vehicle that does not meet the ULEZ standards could still be driven in central London but a daily charge would have to have been paid to do so.

3.1.2 The ULEZ would include additional requirements for TfL buses, taxis (black cabs) and private hire vehicles (PHVs):

- a requirement that all taxis and new PHV presented for licensing from 2018 would need to be zero emission capable;
- a reduction in the age limit for all non-zero emission capable taxis from 2020 from 15 to 10 years (irrespective of date of licensing); and
- investment in the TfL bus fleet so that all double deck buses operating in central London will be hybrid and all single deck buses will be zero emission (at source) by 2020.

3.1.3 Details of the ULEZ option selection and feasibility work which TfL undertook can be found in the ULEZ Supplementary Information Report (TfL, 2014).

3.1.4 The proposed ULEZ requirement by vehicle type can be found in Table 3-A and a breakdown of the ULEZ emission standard for each type of vehicle is provided in Table 3-B.

Category	Vehicle	Proposed ULEZ requirement
TfL buses entering ULEZ	TfL double-decker buses	<ul style="list-style-type: none"> • Euro VI hybrid
	TfL single-decker buses	<ul style="list-style-type: none"> • Zero emission at source
Revised licensing London wide	Taxis	<ul style="list-style-type: none"> • 10 year taxi age limit for all non-zero emission capable taxis • All newly licensed taxis to be zero emissions capable from 2018
	PHVs	<ul style="list-style-type: none"> • All newly manufactured/ newly licensed PHVs to be zero emissions capable from 2018 • All newly licensed second hand PHVs must meet the ULEZ standards • Existing licensed PHVs that do not meet the ULEZ standards must pay the charge when driving in the ULEZ.
Emission-based vehicle charging in ULEZ	Heavy goods vehicles (HGVs)	<ul style="list-style-type: none"> • Euro VI engine (or pay charge when driving in the ULEZ area)
	Non-TfL buses and coaches	<ul style="list-style-type: none"> • Euro 4 engine (petrol) or Euro 6 engine (diesel) (or pay charge when driving in the ULEZ area)
	Light goods vehicles (LGVs)	
	Cars and PHVs	<ul style="list-style-type: none"> • Euro 3 engine (or pay charge when driving in the ULEZ area)
	Motorcycles and power two-wheelers	<ul style="list-style-type: none"> • Euro 3 engine (or pay charge when driving in the ULEZ area)

Table 3-A ULEZ proposals by vehicle type

Vehicle type	Proposed emissions standard ¹	Date from when manufacturers must sell new vehicles meeting the emissions standards	Maximum age of vehicle by 2020 ²	Charge if vehicle is not compliant with the ULEZ standard ³
Motorcycle, moped etc.	Euro 3	From 1 July 2007	13 years	£12.50
Car and small van	Euro 4 (petrol)	From 1 January 2006	14 years	£12.50
	Euro 6 (diesel)	From 1 September 2015	5 years	
Large van and minibus	Euro 4 (petrol)	From 1 January 2007	13 years	£12.50
	Euro 6 (diesel)	From 1 September 2016	4 years	
HGV	Euro VI	From 1 January 2014	6 years	£100
Bus/coach	Euro VI	From 1 January 2014	6 years	£100

¹Euro standards for heavy-duty diesel engines use Roman numerals and Arabic numerals for light-duty vehicle standards.

²Vehicles this age or younger in 2020 will comply with the ULEZ standard and not incur a charge.

³This is payable in addition to any applicable LEZ or CCZ charges and is the charge per day (i.e. 00:00 – 23:59).

Table 3-B ULEZ standard for each type of vehicle

3.2 ULEZ study area

3.2.1 The study area for the ULEZ falls within the Greater London Administrative Area (GLAA). In some instances, areas beyond the GLAA were considered, as changes to vehicle trip patterns on London’s road network brought about by implementation of the ULEZ are likely to extend beyond this boundary.

3.2.2 The study area is divided into five zones as described in Table 3-C, which correspond to those employed in the atmospheric emissions modelling that informed the development of the ULEZ.

Zone	Extent
Congestion Charging Zone (CCZ)	Based on the existing boundary which has been in operation since 2003 (and the boundary for the proposed ULEZ)
Inner Ring Road (IRR)	A 12 mile (19km) route formed from a number of major roads that encircle the CCZ
Inner Zone	Extends outwards from the CCZ to cover a number of London boroughs including Haringey to the north, Newham to the east, Lambeth to the south and Hammersmith and Fulham to the west
Outer Zone	Extending from the boundary of the Inner Zone to the boundary of the GLAA. Includes London boroughs such as Enfield to the north, Havering to the east, Croydon to the south and Hillingdon to the west
Non-GLAA	Covers the area outside the GLAA boundary

Table 3-C Description of the five zones making up the ULEZ study area

- 3.2.3 The same study area, where applicable, was adopted across all assessment reports including the EA, HIA, EqIA and EBIA.
- 3.2.4 With the exception of the IRR (the boundary of ULEZ), the four zones are consistent with the London Atmospheric Emissions Inventory (LAEI) 2010.

4.1 The London Plan 2011

- 4.1.1 GLA Economics reports that London’s total economic output in 2012 was over £300bn (nearly a quarter of the United Kingdom’s (UK) total output), of which inner London accounted for 70 per cent (Douglass, G., 2014). The London Plan 2011 (including revised early minor alterations to the London Plan, October 2013) highlights that there are some 800,000 enterprises in London, of which SMEs¹ account for about 48 per cent of London’s employment. In addition, there are more than 600,000 self-employed Londoners.
- 4.1.2 The London Plan projects that office based employment growth in the Central Activities Zone (CAZ) and the north of the Isle of Dogs will grow by 177,000 between 2011-2031 accounting for nearly 60 per cent of total London wide growth.
- 4.1.3 The London Plan also highlights the importance of tourism to its economy. In 2012, the city attracted 28 million overnight visitors, 16 million from overseas and 12 million from the UK. In addition, there are an estimated 300 million day visitors to London with a total spend of around £11bn, half of which is spent in the City of London, City of Westminster, and the London boroughs of Kensington & Chelsea, Islington and Camden. Seven out of 10 tourism day visitors to London came from Greater London and a large share of the remainder came from neighbouring regions (Kyte, S., 2012).
- 4.1.4 Central London’s economy is therefore critical to the performance not only of London’s economy but the UK’s as a whole.
- 4.1.5 The Mayor has set out his economic policies within the London Plan which include promoting and enabling the continued development of a strong, sustainable and increasingly diverse economy across all parts of London.

¹Defined by the European Commission as businesses employing fewer than 250 employees and with an annual turnover less than or equal to €50m.

5.1 Overview

5.1.1 The objective of undertaking the EBIA was to understand the impact of the ULEZ proposals on London's economy and businesses, in particular on SMEs and those in sectors such as tourism and leisure. Jacobs approach was to understand the impact of the proposed ULEZ by vehicle type and then to understand the use of each vehicle type by economic sector. This required analysis of the number of vehicles by type entering the proposed ULEZ, assessing what proportion will be compliant with the proposed ULEZ standards when they are introduced, and then assessing the impact of those that are not compliant either being replaced or not entering the proposed ULEZ.

5.1.2 This approach highlights those areas of potentially the most significant impacts on the economy, SMEs and tourism.

5.1.3 For those vehicles that are not compliant there are a number of potential responses to the proposed ULEZ, namely:

- *pay the charge;*
- *replace vehicle (with new or second-hand);*
- *adapt vehicle;*
- *reallocate vehicles to ensure those that enter the proposed ULEZ are compliant;*
- *withdraw from serving proposed ULEZ area; and*
- *withdraw from business altogether.*

5.1.4 In assessing the scale of impacts four measures have been used:

- *likely scale of impact cannot be determined – impact is zero or very small and effectively unmeasurable within the context of the economy as a whole or unquantifiable due to insufficient data;*
- *minor (positive or negative) – small impact less than 0.05 per cent of the size of the economy or 1 per cent of an individual sector;*
- *moderate (positive or negative) – impact of 0.05-1 per cent of the size of the economy or between 1-5 per cent of an individual sector; and*
- *major (positive or negative) – impact of greater than 1 per cent of the size of the economy or more than 5 per cent for an individual sector.*

6 Baseline

6.1 Economy

6.1.1 The proposed ULEZ will be implemented in the same area as covered by the CCZ, as shown in Figure 6-A. Whilst not exactly matching with the CAZ or the City of London Westminster and City of Westminster, these two areas have been used as proxies due to their broad spatial overlap of the proposed ULEZ and the availability of economic data.

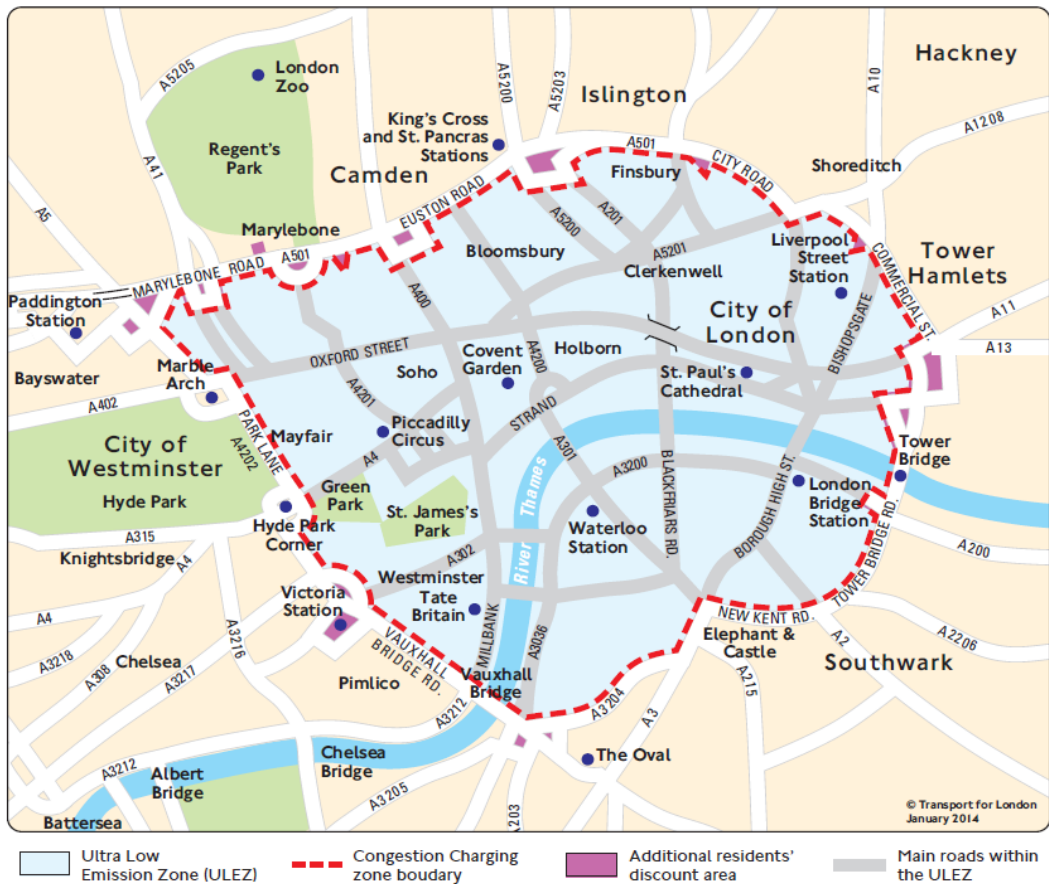


Figure 6-A Proposed ULEZ using CCZ boundary
(Source: TfL, 2014, ULEZ Supplementary Information Report)

6.1.2 The CAZ, while it covers only two per cent of London’s total area and is home to less than four per cent of its population, contains more than a quarter of all London’s jobs and is the most economically productive part of the UK. Table 6-A provides a breakdown of the largest sectors in inner London in terms of employment.

Sector	Number of jobs	Percentage of London total in inner London
Financial services	285,000	86%
Health and social work	226,000	58%
Hotels and restaurants	188,000	62%
Retail	185,000	49%
Education	142,000	46%
Public administration and defence	130,000	58%
Other business services	123,000	60%
Computer related activities	80,000	62%
Legal activities	73,000	85%
Real estate	72,000	66%
Business and management consultancy	71,000	71%
Accounting and consulting	42,000	67%
Advertising	31,000	81%
Research and development	13,000	71%

Table 6-A Key employment sectors in inner London

(Source: GLA, 2010)

- 6.1.3 As the focus of past development of radial transport infrastructure, the CAZ and inner London are highly accessible to a wide area of South East England. More than three million people can travel by public transport from their homes to the CAZ for work and leisure activities within 45 minutes (GLA, 2010, p.30). This accessibility allows businesses in central London to draw on a large and highly skilled labour pool. Strong transport connections to and within central London have the further effect of agglomeration, boosting productivity in the area by improving ease of travel.
- 6.1.4 As already stated, inner London is the key economic driver not only of London’s economy but of the UK as well. It competes not against other parts of the UK but with key cities across the globe. It is also an important international and domestic visitor attraction. The proposed ULEZ seeks to reduce emissions thereby making central London a more pleasant and healthier place to live, work and visit without substantially diluting London’s and the CAZ’s competitiveness.
- 6.1.5 London’s economy has recovered strongly from the economic downturn and its Gross Value Added (GVA) growth rate is forecast to be 3.8 per cent in 2014, 3.2 per cent in 2015 and 2.6 per cent in 2016 (GLA, 2013).
- 6.1.6 The London Plan sets out long term projections for London which show sustained growth with the population projected to reach 10 million by 2036 and employment of nearly six million at the same date. A high proportion of that employment growth is projected to occur in central London. The increase in population and employment is expected to lead to an increase in daily trips from 25m in 2014 to 30m in 2031 (GLA, 2014).

6.1.7 The long-term picture of population and employment growth points to the following trends and challenges:

- *high levels of commuting into and within London requiring high level of access;*
- *high levels of demand and adverse impacts on business productivity from congestion; and*
- *highest concentration of transport connections required in CAZ due to high level of employment.*

6.2 Transport

Trips and journey purpose:

6.2.1 The number of vehicles entering the proposed ULEZ is considerable. On an average weekday some 200,000 vehicles enter the zone. In 2013 nearly six million unique vehicles entered the zone – around 20 per cent of the total UK vehicle parc (that is, the total stock of vehicles). The breakdown of vehicle type is as shown in Table 6-B.

Vehicle type ¹	Unique entries
Car – diesel	1,800,000
Car – petrol	3,200,000
Buses/minibuses/coaches	40,000
LGVs – petrol	19,000
LGVs – diesel	640,000
HGVs	120,000

¹ Taxis and PHV are included in the car numbers

Table 6-B Number of vehicle entries into proposed ULEZ by broad vehicle category
(Source: TfL)

6.2.2 However, the vast majority of these vehicles are infrequent visitors. Out of a total of six million unique car entries, two million only entered the zone once during the year, while just 52,000 enter the zone 200 times a year or more, with taxis accounting for about 20 per cent of these entries. Further details are set out by mode in the Section 6.5.

6.2.3 TfL’s London Travel Demand Survey (LTDS) is an annual survey of households in London based on a travel diary approach. It shows the number of trips made by mode and purpose for different spatial areas including central London.

6.2.4 The latest LTDS data for 2011/12 shows that in central London there are around 600,000 daily trips made by residents, of which just over 60,000 are made by car or motorcycle. That is, other modes are far more important to London residents in terms of trips made as is shown in Table 6-C.

Mode	Percentage market share
Walk	53%
Bus/ Tram	16%
Underground/Docklands Light Railway (DLR)	11%
Car/ Motorcycle	10%
Cycle	4%
National Rail/ Overground	2%
Taxi/ other	5%

Table 6-C Londoner’s mode of transport in central London
(Source: LTDS Workbook, 2013)

6.2.5 In terms of journey purpose, Table 6-D shows that work related trips, including commuting, accounted for just over 100,000 trips, while leisure and shopping trips accounted for around 200,000 each (203,000 and 182,000 trips, respectively). This highlights the importance of different parts of the economy and possible impacts of changes in modal access.

Journey purpose	Number ('000s)
Leisure	203
Shopping and personal business	182
Travel to and from work	61
Education	61
Other work related	41
Other (inc escort/ worship)	20

Table 6-D Londoner’s trips by purpose
(Source: LTDS Workbook, 2013)

6.3 Traffic flows

6.3.1 Central London has seen a marked decrease in the number of vehicles entering and moving within the area for a considerable period of time, down by some 30 per cent in the last decade alone. The reduction has occurred across the whole day including nights, see Table 6-E.

Year	Morning peak			Off-peak	Evening peak			Day	Evening	Night	All day
	In	Out	Both		Both	In	Out				
1997	171	108	279	525	131	169	300	1,103	326	156	1,585
2001	163	101	264	479	122	157	279	1,023	324	166	1,512
2005	130	88	219	403	15	131	236	858	287	155	1,300
2009	119	81	201	368	96	116	212	781	253	144	1,179
2010	113	75	188	358	95	115	210	756	243	135	1,133

Table 6-E All motor vehicle traffic crossing the central cordon by time of day and direction, 1997 – 2010 ('000s)
(Source: TfL Network Performance Traffic Analysis Centre, 2012)

6.3.2 This decrease, as shown in Table 6-F, mainly relates to car² movements but other vehicle movements also declined once the congestion charge was introduced. In part this relates to the removal of transiting vehicles (TfL Network Performance Traffic Analysis Centre, 2012). This reduction in traffic in central London has had no material impact on inner London’s economy. As the sixth congestion charge impact report stated: ‘Overall, five years after the event there is no measurable evidence of any differential impact from the central London congestion charging scheme on business and economic activity, at the aggregate level, based on analysis and surveys conducted by TfL’ (TfL, 2008, p. 189).

Year	Bicycles	Motor cycles	Cars	Taxis	LGV	HGV	Buses and coaches	Total
1997	51	82	1030	162	178	88	45	1585
2001	51	92	942	172	190	71	45	1512
2005	87	88	743	177	179	58	56	1300
2009	120	88	649	163	173	51	62	1179
2010	137	79	606	161	179	51	57	1133

Table 6-F Combined direction 24 hour traffic crossing the central cordon by vehicle type, 1997 to 2010 ('000s)

(Source: TfL Network Performance Traffic Analysis Centre, 2012)

6.4 Travel to work patterns

6.4.1 The number of people entering central London in the morning peak has been recorded for many years. Table 6-G shows the data over the last decade. This shows both a large increase in the total number of people entering central London and changes in mode of travel.

Year	All modes	Nation-al rail	Of which transfer to LUL or DLR	LUL and DLR	Bus	Coach/minibus	Car	Taxi	Two wheel motor vehicle	Cycle
2003	1,010	455	201	522	104	10	86	7	16	12
2008	1,131	510	243	623	114	11	70	7	15	23
2012	1,169	526	246	641	118	11	64	6	14	36

Table 6-G People entering central London in the weekday morning peak, by mode of transport, 2003 to 2012 ('000s)

(Source: TfL’s Central London Peak Count, 2014)

6.4.2 In mode share terms, Table 6-H highlights the declining importance of car use for commuting in the morning peak, accounting for just five per cent of all trips, down from nine per cent over the last decade. Cycle use, underground and DLR have all increased market share in this period.

² In this section cars includes private hire vehicles

Year	National rail	Of which transfer to LUL or DLR	LUL and DLR	Bus	Coach / minibus	Car	Taxi	Two wheel motor vehicle	Cycle
2003	45%	20%	52%	10%	1%	9%	1%	2%	1%
2008	45%	21%	55%	10%	1%	6%	1%	1%	2%
2012	45%	21%	55%	10%	1%	5%	1%	1%	3%

Table 6-H People entering central London in the weekday morning peak, by mode of transport, 2003 to 2012, mode share

(Source: TfL's Central London Peak Count, 2014)

6.4.3 The 2011 population census shows 1.34 million people commute to work in the proposed ULEZ. The number and proportion by each mode is shown in Table 6-I. It is broadly similar to Table 6-G, but as it covers all day rather than just the morning peak it shows a marginally higher proportion that drive. More people are expected to drive who travel outside the normal commuting times especially between late evening and early morning.

Mode	'000s	Percentage
Train	502	37.4%
Underground	455	33.8%
Bus, minibus or coach	133	9.9%
Driving / passenger a car or van	90	6.7%
On foot	69	5.2%
Bicycle	67	5.0%
Motorcycle, scooter or moped	20	1.5%
Taxi	5	0.4%
Other method of travel to work	3	0.2%

Table 6-I People commuting into CAZ by mode, '000s and percentage mode share

(Source: 2011 Population Census)

7.1 Initial scoping

7.1.1 The assessment has been undertaken by vehicle type examining the impact that the proposed ULEZ may have on vehicle use and then on the relevant sectors and SMEs.

7.1.2 Four vehicle groups have been scoped out of the assessment including TfL Buses, historic vehicles, foreign-owned vehicles and motorcycles. This is due to the following reasons:

- *TfL bus contracts will specify vehicle type and the cost of compliance will be part of the tender price;*
- *historic vehicles are excluded from the charge; and*
- *while foreign-owned vehicles will be subject to the proposed ULEZ, data on vehicle types is not readily available from present data sets (Blakemore, B., the PEP Partnership, 2005).*

7.1.3 In 2013, 64,000 unique foreign-owned vehicles entered the CCZ during the congestion charging period, two-thirds of which did not pay the charge and were issued with a penalty notice. This suggests ensuring compliance of foreign-owned vehicles may be difficult, while the propensity for them to continue to enter the proposed ULEZ after it is introduced is not known.

7.1.4 TfL data suggests 95 per cent of motorcycles will be compliant with ULEZ emission standards, which implies only 4,000 motorcycles will be affected. Given the limited use of motorcycles for businesses (of the age that will be impacted), the likely scale of impact on the economy cannot be determined, although there will be impacts on individuals.

7.2 HGV

7.2.1 The UK HGV fleet consists of nearly 400,000 vehicles, of which 80 per cent are less than 10 years old. The present age distribution is shown in Figure 7-A and clearly identifies both the impact of the recent recession and the long tail of older vehicles.

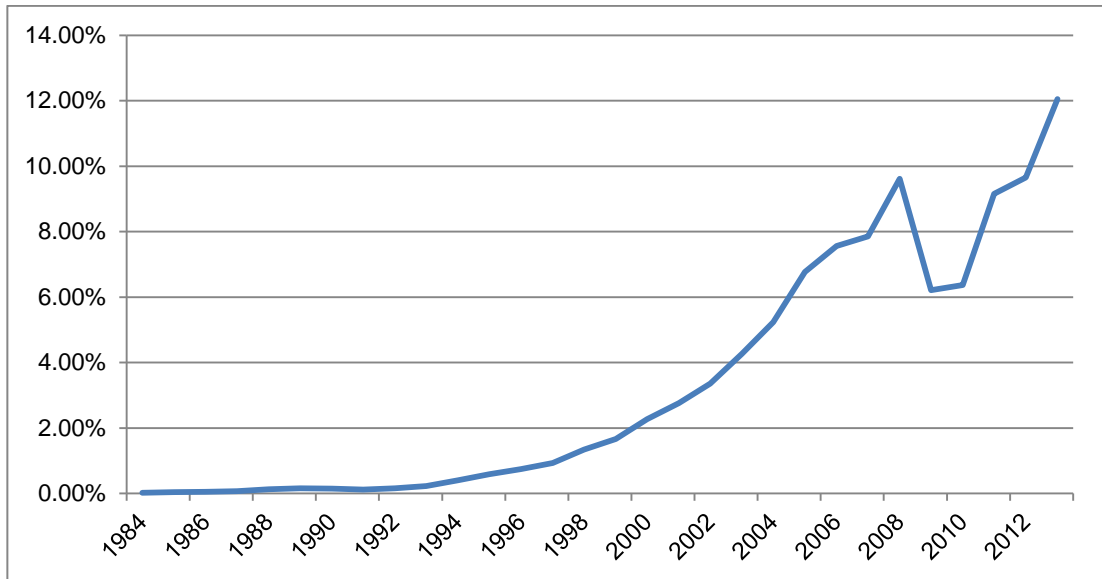


Figure 7-A Proportion of HGV licensed at end of 2013 by year of first licensing
 (Source: Department for Transport, 2014)

7.2.2 The HGV fleet is split between own account vehicles and hire and reward. The former accounts for around one-third of freight carried, mainly in rigid vehicles, while the latter fleet is smaller but consists of mainly larger articulated vehicles undertaking longer distance journeys (Department for Transport, 2012).

7.2.3 According to the Office of the Traffic Commissioners (2014), 9,380 licensed goods vehicle operators were based in the south east region, including London, operating a total of 41,889 vehicles. According to Driver and Vehicle Licensing Agency (DVLA) statistics, 20,000 of these were registered to London addresses (Department for Transport, 2014). This highlights the fragmented nature of the industry, ranging from large fleet operators with thousands of vehicles to single vehicle operators. The Office of the Traffic Commissioners data also shows a decline in the number of operators over time as the industry slowly consolidates.

7.2.4 However, the economic impacts of the proposed ULEZ could extend beyond London, as over a quarter of the UK's HGV fleet entered the proposed ULEZ in 2013 (approximately 120,000 unique HGVs). Of these, 70 per cent entered the proposed ULEZ 10 times or less during the year while 10 per cent, some 12,500 vehicles, entered the zone 50 times or more (i.e. equivalent to weekly). These frequent entrants into the proposed ULEZ account for just under two-thirds of all HGV movements. Of these frequent entrants, 10 per cent were aged over 10 years old showing that older vehicles are still extensively used.

7.2.5 On an average weekday, around 14,000 HGVs enter the proposed ULEZ, with the numbers falling-off considerably at weekends. The main sectors served by these vehicles in central London relate to retail and wholesale distribution, and construction. Other niche sectors include exhibition services, media support, theatre and music industries, waste collection, breakdown and removal vehicles.

- 7.2.6 TfL estimates that just over 80 per cent of HGVs will be compliant with the emissions standards in 2020 and will therefore not be affected by the proposed ULEZ. Of the 20 per cent of vehicles that are not compliant, owners have a range of options, namely:
- *invest in new compliant vehicles;*
 - *reallocate vehicles to ensure vehicles entering proposed ULEZ are compliant;*
 - *retrofit vehicles;*
 - *pay the charge; or*
 - *exit the market.*
- 7.2.7 The approach taken by an operator will depend on the size of its fleet, the sector it is in and the specialised nature, or otherwise, of the vehicle in question.
- 7.2.8 Given the average age of HGVs across the vehicle parc, it is envisaged that between 10-20 per cent of non-compliant vehicles that regularly enter London will be replaced by bringing forward purchase decisions by approximately 12 months. This equates to an additional cost to the operator of around £10,000 to £15,000 (assuming a 10-year vehicle life and the loss of a single year's depreciated value, depending on the type of vehicle). This could relate to around 250 to 500 vehicles (12,500 HGVs regularly entering the proposed ULEZ of which 20 per cent are assumed to be non-compliant). Total cost to businesses would therefore be in the order of £2.5m to £7.5m. These costs are likely to be incurred by businesses across London, the South East and, to a lesser extent, the rest of the UK.
- 7.2.9 The ability of operators to pass on costs to customers will depend on the proportion of compliance within the sector and the degree of competition between operators. So, where most vehicles are compliant and there is intense competition, as is the case with the haulage industry, it is unlikely that most haulage businesses that incur additional costs will be able to pass them on to customers.
- 7.2.10 Fleet operators that have registered for the CCZ (estimated to account for around a third of vehicles entering the proposed ULEZ) have fleets containing vehicles with very varied age profiles often ranging from one to 20 years old. Based on registered fleet composition, it is estimated that 95 per cent of fleet operators with more than 10 vehicles registered (accounting for 90 per cent of vehicles registered) may be able to reallocate vehicles to ensure that only compliant vehicles enter the proposed ULEZ. For smaller fleet operators, it is estimated that this falls to around 75 per cent, based on the age profiles of these fleets. Whilst reallocating vehicles is not entirely costless, as it may lead to inefficient use of resources and a reduction in flexibility, it alleviates the need for upfront investment and could reduce the number of non-compliant vehicles that frequently enter the ULEZ by around 30 per cent.

- 7.2.11 The two measures above are likely to reduce the number of frequent non-compliant vehicles by at least half. A significant proportion of the remaining frequent non-compliant vehicles would be expected to be retrofitted, as this would be cheaper than paying the charge over a year. Assuming a cost of £5,000 to retrofit vehicles and that half of the non-compliant vehicles are retrofitted (1,250); this would be a cost to the industry of £6.25m. Again, it is expected that the haulage industry would need to absorb most of this cost.
- 7.2.12 For a small number of operators, the specialist nature of their vehicles and/or their infrequent entry into the proposed ULEZ, means paying the charge is the most economic proposition and it can possibly be passed on to the end customer. Based on the number of entrants, their frequency of entry and assumed compliance rates, it is estimated that infrequent entrants into the proposed ULEZ that would not be compliant with emissions standards and with no change in behaviour, equate to fewer than seven per cent of all HGV movements. TfL surveys suggest a third of these will no longer enter the proposed ULEZ and, based on the proposed charge of £100, those operators that continue to enter the proposed zone could incur costs of around £5m a year.
- 7.2.13 Based on the above assessment, it is anticipated that the vast majority of businesses that have HGVs regularly entering the proposed ULEZ will continue to do so with minimal impact on the sector or on London's economy as a whole. However, there is likely to be a cost to the sector of around £13.75m to £18.75m in the first year, rapidly falling off in future years as the proportion of the fleet that is compliant increases. This is in the context of an economy of £300bn, so the impact at a macro level is unable to be accurately determined but expected to be about 0.004 to 0.006 per cent. Assuming that the biggest impacts are on the construction and retail sectors, given the value of these sectors in London at around £15bn and £25bn, respectively, the impact will be less than 0.05 per cent for each sector (Office for National Statistics, 2012) and is therefore assessed as minor.
- 7.2.14 However, as indicated above there are a large number of vehicles that enter the proposed ULEZ very infrequently, and for those that are not compliant with the emission standards, part of a large fleet or of a specialised nature, it may be more economical to exit the market. Given the size of the HGV market and the relatively few vehicles impacted, it is expected other operators would take over any business relinquished and therefore any impact on London's economy would be extremely minor.
- 7.2.15 Where there will be an impact, it will be on smaller haulage companies with older vehicles, which have most of their market serving central London. It is, at this stage, not possible to quantify the likely scale of impact given the uncertainties as to how the sector will develop over the next six years. However, as it is assumed that by 2025 virtually all HGVs will be compliant with proposed ULEZ emission standards, due to fleet renewal cycles, any impacts are anticipated to be short lived.

7.3 LGV

7.3.1 The UK LGV fleet has grown dramatically over the last few decades with some 3.4 million registered vehicles, up 19 per cent in the last 10 years (Department for Transport, 2014), as depicted in Figure 7-B. Of these, 3.2 million (95.4 per cent) are diesel, 140,000 (4.2 per cent) petrol and under 15,000 (0.4 per cent) using other fuel types, including petrol and gas. In London, the total number of LGVs has remained relatively static at just over 200,000 vehicles, broadly the same as 20 years ago. The average age of LGVs tends to be older than for HGVs with the average age of the vehicle parc being eight years. It is notable that the number of new LGV registrations has not recovered as fast after the recession as for HGVs, which may partly explain the older average age of the vehicle parc.

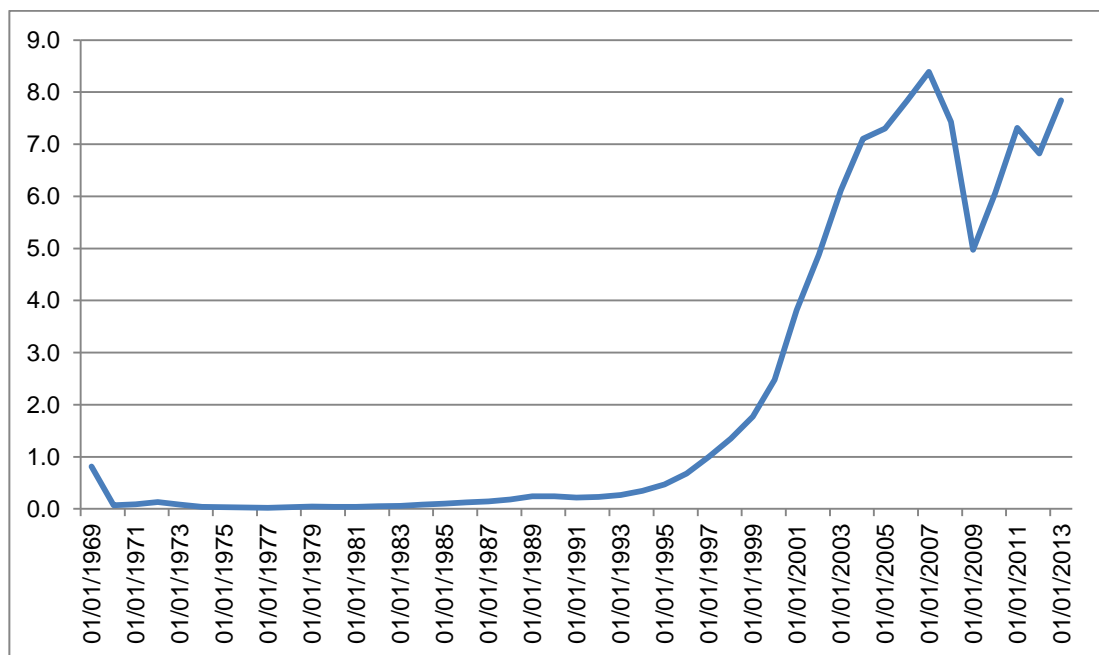


Figure 7-B Proportion of LGV licensed at end of 2013 by year of first licensing
 (Source: Department for Transport, 2014)

7.3.2 The pattern and proportion of LGVs entering the proposed ULEZ is similar to that for HGVs. There were around 660,000 unique LGVs that entered the proposed ULEZ in 2013, just under 20 per cent of the entire UK LGV parc. The vast majority of these were irregular visitors with nearly 70 per cent entering 10 times or less during the year and just over 10 per cent (some 68,000 vehicles) entering 50 times or more (i.e. weekly). In total, more than 36,000 LGVs enter London each weekday, broadly halving on Saturdays and halving again on Sundays, highlighting the fact that these are principally work-related trips. There were in total over 12 million LGV entries into the proposed ULEZ in 2013, with 63 per cent of these undertaken by those entering 50 times a year or more.

7.3.3 LGVs play an important part in all sectors of London's economy, from servicing financial and business service companies to supporting London's network of independent retailers and food outlets. LGV ownership is broadly split 50:50 between companies and private owners, showing their importance to owner run businesses.

- 7.3.4 Based on the current age profile of LGVs entering the CCZ (see Appendix 1), virtually all petrol fuelled LGVs are expected to be compliant with proposed ULEZ emission standards in 2020. Only a minority of diesel-fuelled vehicles are expected to be compliant. In total, just over half the fleet are expected by TfL to be non-compliant.
- 7.3.5 For those that are not compliant, owners have a number of options, namely:
- *invest in new compliant vehicles, including second hand petrol vehicles;*
 - *reallocate vehicles to ensure vehicles entering proposed ULEZ are compliant;*
 - *pay the charge; or*
 - *exit the market.*
- 7.3.6 It is presently assumed that it will not be possible to retrofit non-compliant LGVs to meet the proposed ULEZ requirements.
- 7.3.7 LGV operators can either buy new vehicles or switch to second hand petrol vehicles albeit, as already highlighted, there are relatively few of the latter. Given the average age of LGVs across the vehicle parc, it is anticipated that between 10 to 30 per cent of non-compliant vehicles that regularly enter the proposed ULEZ may be replaced by bringing forward purchase decisions by up to 24 months. This equates to an additional cost to the operator of around £2,000 to £8,000 per vehicle, depending on whether the vehicle replacement is a second hand petrol or new diesel and the loss of one or two year's depreciated value. This could impact between 3,600 to 10,800 vehicles at a cost ranging from £7.2m to £86.4m. To put this into perspective over 270,000 LGVs were newly registered in 2013 and therefore the likely scale of impact on the ability of the market to accommodate this additional demand is minor. Given the high proportion of non-compliant LGVs, thereby reducing competition, operators may be able to pass these additional costs on to customers. However, this may not always be possible and any increased costs will also have an impact on customers.
- 7.3.8 As previously stated, operators have fleets containing vehicles with very varied age profiles and, based on registered fleet composition, it is estimated that 95 per cent of fleet operators with more than ten vehicles registered may be able to reallocate vehicles to ensure that only compliant vehicles enter the proposed ULEZ. For smaller fleet operators, it is estimated, based on age profiles, this falls to around 75 per cent. Whilst reallocation of vehicles is not entirely costless, as it may lead to inefficient use of resources and a reduction in flexibility, it alleviates the need for upfront investment and could reduce the number of frequent non-compliant vehicles by around 30 per cent.
- 7.3.9 These two measures could result in up to 60 per cent of non-compliant vehicles becoming compliant.
- 7.3.10 However, this still leaves around 20 per cent of all regular entrants into the proposed ULEZ being non-compliant. Based on the proposed charge of £12.50, these operators could incur charges of around £9m a year based on numbers and frequency of entry into the proposed ULEZ.

- 7.3.11 For a small number of operators, their infrequent entry into the proposed ULEZ means paying the charge is the most economic proposition and it can possibly be passed on to the end customer. The cost to the sector could be as high as £30m a year based on the proposed £12.50 charge, frequency of entry into the proposed ULEZ and the proportion of vehicles that are compliant.
- 7.3.12 Based on the above assessment, it is anticipated that the vast majority of businesses that have LGVs regularly entering the proposed ULEZ will continue to do so, however, both they and their customers will see some price increases, possibly equivalent to around £46.2m to £125.4m a year, decreasing over time as the fleet becomes more compliant. To put this into perspective this compares to a total London economy valued in excess of £300bn. The impact is therefore equivalent of 0.04 per cent of this total. Even if it is assumed the impacts are split between just the retail, catering and accommodation sectors, which are worth some £25bn and £8bn, respectively, in London the impact will be less than 0.4 per cent.
- 7.3.13 However, as indicated above, there are a large number of vehicles that enter the proposed ULEZ very infrequently and, for those that are not compliant with the emission standards or part of a large fleet, it may be more economical to exit the market. There will undoubtedly be an impact on some marginal small businesses throughout London and the south east as a result. It is, at this stage, not possible to quantify the likely scale of this impact as it is not known what sectors non-compliant vehicles may be serving. That said, observation suggests independent retailers and market traders may be disproportionately impacted. These impacts will continue for some time, as around a quarter of the LGV fleet is still expected to be non-compliant, even by 2025.

7.4 Cars

- 7.4.1 A significant number of cars not only enter the proposed ULEZ, but are also registered to addresses within it. There are some 54,000 cars with registered owners living in the City of London and the City of Westminster, down nearly 10,000 over the last 10 years. It is proposed all residents living in the proposed ULEZ area will be granted a three year time-limited 100 per cent discount in recognition that they are unable to avoid the zone. ULEZ residents' vehicles would therefore need to be compliant with applicable ULEZ emissions standards from 2023 (instead of 2020). After that point, residents must pay 100 per cent of the charge to drive a non-compliant vehicle in the ULEZ.
- 7.4.2 Based on the current age profile of cars entering the CCZ (see Appendix 1), it is estimated that around 97 per cent of all petrol fuelled cars will be compliant with the proposed ULEZ emission standards by 2020, but only around 60 per cent of diesel vehicles. The result is that around 75 per cent of all cars are expected to be compliant in 2020.
- 7.4.3 Just over five million unique cars entered the proposed ULEZ in 2013, out of a total parc of 30m. The proportion of infrequent entrants is even higher than for other vehicle types, with just over 80 per cent of those vehicles entering ten times or less in a year. Just fewer than five per cent entered the zone 50 times a year or more, which equates to 250,000 vehicles. Of these, around 50,000 are estimated to be residents' vehicles. Just 0.56 per cent of cars entered 200 times or more, which could equate to daily commuters, and

accounts for nearly 17,000 vehicles. On an average weekday, some 90,000 cars enter the proposed ULEZ; increasing markedly at weekends due to fewer parking restrictions and no congestion charge, see Table 7-A and Table 7-B.

	Total	00:00 – 07:00	07:00 – 10:00	10:00 – 16:00	16:00 – 19:00	19:00 – 22:00	22:00 – 00:00
Weekday	83,700	15,700	9,800	21,000	13,900	14,500	8,900
Saturday	106,300	24,200	9,100	27,700	17,200	16,800	11,400
Sunday	117,300	28,100	9,900	35,500	19,900	15,700	8,200

Table 7-A Cars entering proposed ULEZ by time period
(Source: TfL)

	Total	00:00 – 07:00	07:00 – 10:00	10:00 – 16:00	16:00 – 19:00	19:00 – 22:00	22:00 – 00:00
Weekday	95,600	14,900	13,100	26,100	15,800	16,800	8,900
Saturday	113,900	20,700	10,700	30,800	19,600	20,100	11,800
Sunday	116,300	23,500	10,800	37,800	19,900	16,100	8,200

Table 7-B Cars exiting proposed ULEZ by time period
(Source: TfL)

7.4.4 It is notable that a high proportion of cars that enter and exit the proposed ULEZ do so between 22:00 and 07:00.

7.4.5 As stated, while the vast majority of petrol driven cars are expected to be compliant with proposed ULEZ emissions standards, but only just over half of diesel fuelled cars. In addition the proportion of the car parc that is diesel fuelled is expected to increase. This may have repercussions going forward and on-going publicity may be required to highlight the downsides of purchasing older diesel vehicles³.

7.4.6 For those whose cars are not compliant, owners have a number of options, namely:

- *invest in new compliant vehicles, including second hand petrol vehicles;*
- *switch modes;*
- *pay the charge;*
- *continue to drive into inner London but park outside the proposed ULEZ and continue their journey by other modes; or*
- *no longer travel into the proposed ULEZ.*

7.4.7 The use of cars in the CAZ varies from work related to commuting and leisure and each of these can impact on London’s economy.

³ Recent media publicity about the pollution consequences of diesel cars (for example <http://www.standard.co.uk/news/london/boris-johnson-urges-george-osborne-to-increase-road-tax-on-diesel-cars-in-london-9384026.html> and also <http://www.telegraph.co.uk/motoring/green-motoring/10997571/Should-I-keep-my-diesel-car.html>) has been due to TfL’s proposals.

(a) Travel to work

- 7.4.8 As seen in Table 7-A, the number of cars entering the proposed ULEZ during the morning peak period is relatively low and it is not expected that the proposed ULEZ will have an impact on travel to work patterns during the main working day. However, Table 6-I also shows that 90,000 people commute into the zone by car or van, suggesting that those who do drive to work may do so outside normal commuting times. This would appear to be borne out by the fact that more cars enter the proposed ULEZ between 19:00 and 22:00 than between 7:00 and 10:00. While there is no breakdown of journey purpose by time of day, it can be assumed that some of these people will be working in the night-time economy and benefiting from free parking and no congestion charge. A recent TfL study on the economic impacts of the night tube suggests some 6,000 people are working at night (i.e. after 22:00) in the City of Westminster (TfL, 2014). This does not take into account workers who start early such as cleaners. In fact, the same report notes a survey of night bus users, which shows 47 per cent of passengers are travelling to and from work. A conservative approach would be that a higher percentage of workers commute in by car at these times than during the morning peak period.
- 7.4.9 However, given that 75 per cent of cars are expected to be compliant, the availability of other modes, the potential to park outside the zone and continue a journey by other modes, and the size of the London labour market, no material impact on London's economy or to the night-time economy by the proposals is anticipated. However, there may well be an impact on individuals who decide not to continue to work in inner London, which would impose an additional cost on employers.
- 7.4.10 Potential associated impacts on protected groups are covered in the equality impact assessment.

(b) Business trips

- 7.4.11 As with LGVs, there are a number of businesses that will use cars for work purposes. During the congestion charge period, it is estimated that nearly half of car drivers within the proposed ULEZ are travelling for business purposes (TfL, 2006). This ranges from trades people to those offering care and other services to residents in their homes, as well as those attending meetings, conferences, and the like. It is anticipated that 10-30 per cent of non-compliant cars that regularly enter the proposed ULEZ may be replaced by bringing forward purchase decisions by up to 24 months. This equates to an additional cost to the operator of around £2,000 to £6,000 per vehicle (depending on whether vehicle replacement is second hand petrol or newer diesel, and the loss of one or two year's depreciated value). Assuming a third of regular journeys are business related (assumes a reduced proportion of business car journeys outside congestion charge period) this could impact between 1,600 to 5,000 vehicles at a cost ranging from £3.2m to £30m. Given the low proportion of non-compliant vehicles, operators are unlikely to be able to pass these costs on to customers. If they are able to pass on these costs, then they will be borne by customers so the impact on the London economy will be similar.
- 7.4.12 There are a number of businesses that operate luxury and/or classic cars, especially for weddings and funerals. These vehicles tend to be low mileage and hence older than average. Classic vehicles are proposed to be exempt

from the proposed ULEZ, while for other vehicles it is envisaged that if they are not compliant, and subject to a charge of £12.50, it will not have a material impact on these businesses and can be passed on to customers.

(c) Leisure and night-time economy:

7.4.13 As shown by Table 7-A and Table 7-B, a high proportion of cars enter and exit the proposed ULEZ between 22:00 and 07:00 when public transport is less available/ attractive and there is no congestion charge. For example, between 19.00 on Saturday and 07.00 on Sunday, 56,000 cars enter the proposed ULEZ. A recent study for London Councils (Tyler, Semper, Guest & Fieldhouse, 2012) found no research into parking availability, and hence car use, and the night-time economy. However, to put car use into perspective, the West End Commission reported that Leicester Square alone sees over 225,000 visitors every Saturday night (West End Commission, 2013) and night buses that predominantly serve central London are used by over 100,000 people a night.

7.4.14 Based on the number of cars entering London during the evening and night-time, a conservative estimate is that between 10 to 20 per cent of London's night-time economy is using cars at present, and therefore between three to five per cent may be dependent on non-compliant vehicles. These individuals are likely to pay the charge, change modes or not travel to central London. Based on surveys undertaken by TfL, it is expected people will broadly split equally between these choices leading to the risk of a loss of business of one to two per cent, representing a risk of a financial loss to the night-time economy. Research suggests this sector is worth around £2bn in the City of Westminster (Service Network, 2010), so this equates to a possible loss of £20m to £40m, and hence a moderate impact on this sector.

7.4.15 The ongoing improvements to the coverage and frequency of night bus services and later London underground services should help to offset this impact by providing improved public transport access to central London at night.

7.5 Other buses, coaches and minibuses

7.5.1 TfL scheduled buses are outside the scope of this assessment. Heritage sightseeing vehicles, which meet the DVLA's 'historic vehicle class' and are therefore tax exempt, will also be exempt from the proposed ULEZ standards.

7.5.2 The number of unique buses and coaches entering the proposed ULEZ in 2013 was 40,000. Of these, 15,000 were less than five tonnes and 25,000 were over. The former are generally minibus type vehicles, some of which will operate scheduled services, inter-company shuttles for multi-site operators and airport-hotel link services, while others relate to private hire and private uses (e.g. by schools and clubs). The latter category is principally buses and larger coaches.

7.5.3 Of the minibus-type vehicles, most of these are relatively irregular visitors, with over 80 per cent entering the proposed ULEZ ten times or less a year and less than one per cent entering the zone 200 times a year or more. The latter are likely to be operating scheduled services, including inter-company shuttle services and airport-hotel services. Around 900 minibuses enter 50

times a year or more and account for nearly 60 per cent of all entries into the proposed ULEZ for this vehicle type.

- 7.5.4 Based on the current age profile of vehicles (see Appendix 1), around 60 per cent of vehicles are not expected to be compliant by 2020, although, of the regular visitors to the zone, this number falls to below 50 per cent. Given the average age of vehicles, it is envisaged that between 10-30 per cent of non-compliant vehicles that regularly enter London may be replaced by bringing forward purchase decisions by up to 24 months. This will be an additional cost to the operator of around £5,000 to £10,000 per vehicle (depending on whether vehicle replacement is second hand petrol or newer diesel, and the loss of one or two year's depreciated value). This could impact between 45 to 135 vehicles at a cost ranging from £225,000 to £1.35m. Given the high proportion of non-compliant vehicles, operators may be able to pass these costs on to customers, but this may not always be possible and increased costs will also have an impact on customers.
- 7.5.5 Some fleet operators will also be able to reallocate vehicles to ensure compliance. This coupled with replacement is likely to lead to at least 75 per cent of minibuses that regularly enter the proposed ULEZ complying with emission standards. This would still mean 25 per cent of regular entrants remain non-compliant and, assuming a charge of £12.50, these operators could incur charges of around £100,000 a year. Non regular entrants into the proposed ULEZ, if they continue to enter the zone, may incur costs of around £400,000 a year.
- 7.5.6 Coach operations include scheduled services covering international and domestic long distance and airport and commuter services, as well as sightseeing, tourist and leisure trips. The London central coach survey records the number of coaches at different times of the year entering and exiting the CAZ. The latest figures for 2011 show numbers peak in the summer at around 3,300 falling to 2,600 in the autumn. Depending on the time of year, scheduled services account for 50 to 75 per cent of total movements, as their numbers remain fairly constant at around 1,700 a day throughout the year. Foreign and private tour vehicles numbers vary throughout the year reflecting tourist peak periods.

	Easter	Spring	Summer	Autumn
Private tour	30%	31%	37%	26%
Scheduled	47%	54%	51%	66%
Foreign	20%	13%	8%	7%
Other/ Unallocated	3%	2%	4%	1%

Table 7-C Proportion of coaches by main type
 (Source: TfL, 2011 Central London Coach Survey)

(a) Commuter services

- 7.5.7 These mainly operate from Kent into the Isle of Dogs and on into central London and, with a few exceptions, provide only a Monday to Friday peak-period service. With over 100 vehicles a day, they provide an important travel to work service on this corridor. During the day, some of these vehicles operate private tour services (e.g. for schools). The age profile of vehicles presently (see Appendix 1) used suggests that only around half will be compliant with proposed ULEZ emission standards.

(b) Short distance services

7.5.8 These include high frequency services to Oxford, Green Line all day limited stop services to centres to the north and west of London, and airport dedicated services. Again over 100 vehicles a day are used to provide these services. Fleet profiles are varied; those operating on Oxford and airport services tend to be modern vehicles and would be expected to be compliant with proposed ULEZ standards. Green Line fleets tend to be older with 40 per cent of the fleet not expected to be compliant, which probably reflects the more marginal profitability of these services.

(c) Long distance schedule services

7.5.9 National Express and Megabus operate around 600 scheduled services from London each day. National Express, which has about 85 per cent of the market share, has a policy of requiring its coach operators to use vehicles that are seven years old or less. However, this requirement does not apply to duplicate services at peak periods. Megabus tends to operate a modern fleet. It is anticipated therefore that only around 10 per cent of vehicles on these services will not be compliant with proposed ULEZ emission standards.

(d) Tourist services (sightseeing and general)

7.5.10 Some 200 coaches operate registered tourist services within London; these are mainly sight-seeing services. The age profile of this fleet tends to be older due to their lower annual mileage. Only around a third of these vehicles are estimated to be compliant with proposed ULEZ standards.

7.5.11 Of those coaches that enter the proposed ULEZ on a less regular basis (less than 50 times a year), and which are assumed to be operating private and tourist trips, around 60 per cent are expected to be non-compliant.

7.5.12 Operators that have non-compliant vehicles have a number of options including:

- *invest in new compliant vehicles;*
- *possibly retrofit Euro V to Euro VI but the ability to do this is presently uncertain;*
- *reallocate vehicles to ensure vehicles entering the proposed ULEZ are compliant;*
- *pay the charge; or*
- *no longer travel into the proposed ULEZ.*

7.5.13 With the cost of a new coach at typically £250,000, bringing forward investments in coach services are very expensive and probably less likely than for other vehicle types. While some large operators may be able to reallocate vehicles, it is generally the case that newer vehicles will already be operating on London services due to the nature of the market. It is currently not known whether it is possible to retrofit Euro V to Euro VI standards.

(e) Short distance regular services and long distance scheduled services

7.5.14 For short and long distance scheduled services that serve Victoria coach station or the neighbouring area, many do not enter the proposed ULEZ. Those that do, travelling predominantly to and from the east and south east of London, can be re-routed to avoid it. Given the age of vehicles and ability to re-route if necessary, it is not envisaged that there will be any impact on these services.

(f) Commuter services

7.5.15 Commuter services operating from the south east tend to serve the Isle of Dogs, the City of London and the Whitehall/Victoria area. There is little opportunity for these services to avoid the proposed ULEZ, except by some services terminating at Canary Wharf and requiring passengers to change to compliant vehicles for onward journeys. This would be operationally difficult and cause considerable disruption to passengers. The cost of replacing coaches to comply with proposed ULEZ standards would be in the order of £5m (50 x £100,000 to take account of loss of depreciated value of existing coaches displaced). Given the competitive nature of the commuter market, some operators may not be able to pass on the cost to customers, as it would erode the differential between rail and coach to such a level that passengers will switch mode and some marginal routes may be lost. Given these routes bring far fewer passengers into central London compared to the overall one million that commute via all modes; the impact on the economy will be minor. However, it could be expected to impact on individuals and some businesses may face additional recruitment costs if employees decide to give up working in London.

(g) Tourist services

7.5.16 With only an estimated third of London-based sightseeing services meeting emission standards, if companies are unable to retrofit vehicles, they are likely to face substantial costs to replace vehicles, or decide to leave the market. Based on a TfL survey (TfL, 2011), it is anticipated that 10 per cent of vehicles will leave the market and it is assumed operators will be able to reallocate a further 10 per cent of vehicles to ensure compliance. This leaves around 90 vehicles having to be replaced, giving a cost of compliance in the order of £9m (90 x £100,000 to take account of loss of depreciated value of existing coaches displaced). This will lead to higher costs for tourists, as operators recoup their additional costs which may lead to changes in the items that tourists spend their money on, but will not impact on visitor numbers or total spend.

7.5.17 Over half of all coaches that enter the proposed ULEZ do so less than ten times a year and there is no rationale for operators to replace vehicles to purely meet proposed ULEZ emission standards. Whether they continue to enter the zone will be dependent on their ability to reallocate vehicles or their ability to pass on the charge to their customers. Based on a charge of £100 to enter the proposed ULEZ, it is possible, based on TfL surveys (TfL, 2011), that 40 per cent of non-compliant coaches will withdraw from the market. This could lead to the loss of some 70,000 coach trips to London. Based on Confederation of Passenger Transport data (Confederation of Passenger Transport UK, year unknown), this could represent a loss of around £15m in tourist spend in London out of a total tourist economy worth in excess of £6.6bn (GLA Economics, 2012), equivalent to 0.2 per cent, therefore

considered a minor impact. Assuming the remainder pay the charge, then the industry could incur costs of around £10m a year, which is assumed to be passed on to passengers.

7.6 Taxis and PHV⁴

(a) Taxis

7.6.2 In London, all taxi (black cabs) and private hire services have to be licensed by TfL. Taxis can be hailed in the street, hired from ranks throughout the city or pre-booked. All are accessible. PHVs can only be pre-booked and are not wheelchair accessible, except for a small proportion of specially adapted vehicles. Under the present proposals, from 2018 all new taxis and PHVs (including minicabs) must be zero emission capable alongside an accompanying reduction in the maximum vehicle age limit for taxis in 2020. However, TfL proposes to exempt taxis from the ULEZ charge.

7.6.3 There are more than 22,000 licensed taxis in London and nearly 25,000 taxi drivers, the vast majority of which operate within central London. Of these 25,000 drivers, there are approximately 3,600 suburban drivers that can only collect fares in the area they are licensed for, they can take passengers anywhere in London but then must return to their licence area to accept another fare. Whilst almost 50 per cent of taxis enter the proposed ULEZ over 200 times a year, 18 per cent enter ten times a year or less, which broadly equates to the suburban drivers.

7.6.4 Taxis are principally a central London transport mode, with 84 per cent of all taxi trips taking place within, to or from central London, and 30 per cent beginning and ending within it. On an average day, about 185,000 passenger-carrying taxi journeys are made carrying 278,000 passengers.

7.6.5 Taxi use by time of day and day of week is shown in Table 7-D. As can be seen, the majority of trips are during the Monday to Friday working day, with relatively few trips at night or at weekends.

Time period	Proportion of trips
Monday – Friday (06:00 – 19:59) daytime	77
Saturday & Sunday (06:00 – 19:59) daytime	5
Monday – Friday (20:00 – 21:59) evening	7
Saturday & Sunday (20:00 – 21:59) evening	1
Nights all week (22:00 – 05:59)	9

Table 7-D Proportion of taxi trips by time period
 (Source: Taxi/PHV Diary Survey, 2009 for TfL by GfK Consumer Services, 2010)

7.6.6 A significant proportion of taxi trips at all times are to and from work (around a quarter), particularly between 20:00 and 06:00. A number of employers will pay for taxis for employees working anti-social hours, while some employees will use them to avoid public transport at these hours. In total, around 40 per cent of taxi trips are work-related. The remainder are for leisure, shopping and personal business.

⁴ Most of the data in this section is taken from Taxi/PHV Diary Survey 2009 prepared for TfL by GfK Consumer Services January 2010

- 7.6.7 It is estimated that around a fifth of taxi passenger trips are made by overseas visitors and a further fifth by domestic visitors to London.
- 7.6.8 The reduction in the maximum age of non-zero emission capable taxis from 15 to 10 years, as required by ULEZ, will require around a third of vehicles to be replaced sooner than would normally be the case. Taxi drivers with older vehicles can:
- *invest in new vehicles, including second hand that meet the age limit but availability of the latter is expected to be virtually nil; or*
 - *withdraw from the market.*
- 7.6.9 Virtually all taxi drivers are self-employed and would therefore have to bear the cost of a new vehicle themselves while at the same time seeing the value of their present taxi diminishing. With a new zero emission vehicle costing approximately £40,000, and a high proportion of drivers over the age of 50, there is a risk, even with mitigation, of an exit of drivers and vehicles from the market.
- 7.6.10 The alternative view is that there will be a greater sharing of taxis – at present there are around 13 per cent more drivers than taxis. However, as peak demand for taxis is during the working day, an overall reduction in taxi availability could still have an impact. It is also worth noting that the number of drivers continues to increase despite restrictions, such as the 15-year taxi age limit (introduced in 2012), being implemented.
- 7.6.11 If data on the number of registered drivers is a good indicator of relevant market share, it would appear that taxis have been challenged by PHVs in London over the last decade, Table 7-E.

	Taxis ('000)	Taxi drivers ('000)	PHV ('000)	PHV drivers ('000)	Percentage of PHV drivers as a percentage of all licenced drivers
2005	20.8	24.9	40.0	40.0	62%
2009	22.3	24.8	49.3	55.8	69%
2013	22.2	25.9	49.9	67.0	72%
Change 2013/2005	7%	4%	25%	67%	

Table 7-E Number of licenced taxis, PHVs and drivers
 (Source: Taxi and private hire vehicle statistics: England and Wales 2013, DfT)

- 7.6.12 With the growing use of mobile apps to pre-book PHVs, the pressure on taxis is likely to continue, although nearly half of all taxi trips start from being hailed on-street. Outside central London, the suburban taxi market, where earnings tend to be lower and competition from PHVs higher, could see the biggest decline in taxi availability, if drivers decide that the ability to make a reasonable return on a substantial investment declines.
- 7.6.13 TfL is proposing mitigation measures that will compensate taxi drivers who need to replace their vehicle earlier than expected. At this stage it is not clear what the take up of this measure will be and it would be prudent to assume some drivers may decide to leave the sector. With enough advance warning of the proposed changes, it is anticipated that the supply industry will be able to cope with increased demand for new vehicles.

7.6.14 A reduction in taxi availability will have an impact on business to business travel and tourism travel, making central London a slightly less attractive location to do business or visit, but this is not expected to be material.

7.6.15 As taxi drivers are self-employed, the impact is considered by the EqIA. There are a number of SMEs that depend on taxis, from owners of fleets to those who maintain and service vehicles. A reduction in taxi numbers will impact on these businesses. However, it is envisaged that any reduction in taxi numbers will be offset by increased numbers of PHVs leading to off-setting benefits elsewhere.

(b) PHV⁵

7.6.16 There has been a substantial increase in the number and, hence, presumably the use of PHVs in recent years (see Table 7-E). Much of the data presented below, which comes from 2009, is likely to underestimate the present position. It does however provide a comparison with the taxi data above. The market has been split into two sub-sectors; standard minicab operations and chauffeur/executive services.

7.6.17 Minicabs are estimated to carry around 230,000 passengers a day and chauffeur/executive services a further 50,000 a day. Therefore, these services carry broadly the same number of passengers as taxis, but in different parts of London. While taxis are concentrated in central London, minicabs are predominately used in outer London, with over half of minicab journeys taking place within the outer London boroughs.

7.6.18 Executive services are more dispersed, although there is a high proportion of airport related trips and trips to outside greater London.

7.6.19 There are other major differences between taxi and PHV use with the latter used far more at night as shown by Table 7-E.

Time period	Proportion of trips
Monday – Friday (06:00 – 19:59) daytime	62
Saturday & Sunday (06:00 – 19:59) daytime	9
Monday – Friday (20:00 – 21:59) evening	7
Saturday & Sunday (20:00 – 21:59) evening	1
Nights all week (22:00 – 05:59)	19

Table 7-E PHV use by time period

(Source: Taxi/PHV Diary Survey, 2009 for TfL by GfK Consumer Services, 2010)

7.6.20 As with taxis, around a quarter of all PHV trips are to and from work, including those undertaken at night. In-work trips account for a further 10 per cent of PHV trips and 40 per cent of executive/chauffer trips.

7.6.21 Minicabs are used less by visitors and tourists than taxis, accounting for just 11 per cent of trips. However, for executive/chauffer services they account for 39 per cent, reflecting a high proportion of airport-related work.

7.6.22 Given the younger age profile of most PHVs compared to taxis, a higher proportion of vehicles are expected to be compliant. In addition, there is a

⁵ Most of the data in this section is taken from Taxi/PHV Diary Survey 2009 prepared for TfL by GfK Consumer Services January 2010

wide range of alternative vehicles, including second hand petrol vehicles, enabling drivers to change vehicles if needed.

- 7.6.23 The majority of minicab trips do not enter the proposed ULEZ and large fleet operators may have some flexibility in moving vehicles around, although most drivers are self-employed and there may well be earning implications for individuals. So while there will be an impact on individual drivers, it is not anticipated that there will be a material impact on the availability of minicabs in central London, and hence no impact on London's economy or SMEs.
- 7.6.24 There are also other PHV operators, in particular tour guides and those who operate contracts for local authorities (e.g. for travel to and from school). These may use different types of vehicles to those commonly used for minicab purposes given the nature of the work they do and new vehicles that are compliant with the requirements for newly licensed PHVs may not be available in 2018 or may be too expensive for some PHV operators and drivers. While some individuals may be impacted by the ULEZ, the likely impact on London's economy as a whole is minor.
- 7.6.25 PHV operators and drivers, who need to replace vehicles to become compliant with ULEZ proposals, are able to access the plug-in car and van grants from the Office for Low Emission Vehicles (OLEV). This is a grant of 25 per cent towards the cost of the vehicle, up to a maximum of £5,000, when purchasing a qualifying ultra-low emission car and registering it for the first time in the UK.

8 Summary

8.1 Summary impacts

8.1.1 It is apparent that a relatively high percentage of the UK vehicle parc enters the proposed ULEZ, around 20-25 per cent, depending on vehicle type. Whilst the majority of these are only very occasional visitors, it highlights the need to make businesses and individuals aware of the proposed scheme across the south east and the UK.

8.1.2 The total cost to businesses of either complying with the proposed ULEZ or paying the charge is expected to be up to £250m in the first year, but will diminish over time as the proportion of vehicles becoming compliant increases. Table 8-A provides a summary of possible impacts across both IIA Objectives.

Vehicle type	Cost of complying with proposed ULEZ in first year	Main sectoral impacts	SME impacts
HGV	£13.75-18.75m	Retail and construction	Haulage companies
LGV	£46.2-125.4m	Retail, catering, markets	Independent retailers, market traders, food suppliers, tradespeople
Cars	£3.2-30m	Care sector, home based services	Tradespeople, care sector
	£20-40m	Night-time economy	Catering, leisure
Minibuses	£0.6-1.8m	-	-
Coaches	£24m	Coach sector	Coach operators
	£15m	Tourist sector	
Total	£120m-£250m		

Table 8-A Possible cost to business and SME impacts of proposed ULEZ

IIA objective – London’s economic competitiveness:

8.1.3 The estimated costs will be around 0.03-0.08 per cent of the annual value of London’s economy (approximately £300bn). Some of the cost of compliance (e.g. vehicle replacement and retrofitting) will be spent within London, so it is not a total loss to the London economy. Some operators potentially impacted by the proposed ULEZ are also not based in London, so the net impact on London’s economy will be less than this figure. In addition, operators that purchase new vehicles should experience reduced operating and maintenance costs. In future years, the cost will fall as a higher proportion of vehicles become compliant, so that by 2025 the cost will reduce to virtually zero, with the exception of LGV operators.

8.1.4 The scale of impacts on particular sectors is still to be determined once more comprehensive data is available. Table 8-B looks at a worst case scenario, where costs of compliance are borne by only a few sectors, mainly retail, construction and catering/accommodation. The impacts range from one to two per cent for the night-time economy and one per cent for coaches (both impacts assessed as moderate), to very small percentages of 0.4 per cent or

less for the other sectors. For London’s economy, the impact is assessed to be no more than 0.08 per cent of output in year one. In all cases, the impacts reduce over time. They are gross impacts and no deductions for any possible mitigation or other positive externalities (e.g. health, environmental quality, ecosystem services, etc.) have been factored in.

Main sectoral impacts	Estimated impact as % of sector	Impact
Retail	0.4%	Minor
Construction	0.05%	Minor
Accommodation/catering	0.4%	Minor
Night-time economy	1-2%	Moderate
Coach	1% ¹	Moderate
Tourist sector	0.2%	Minor
Whole economy	0.03-0.08%	Minor-moderate

¹Only UK figures are available on the size of the coach sector which CPT estimated at £2.35bn

Table 8-B Possible sectoral cost and impact

- 8.1.5 The primary driver for the proposed ULEZ is to improve air quality and related health impacts, which are covered in the HIA and EA. The health benefits associated with the ULEZ can be valued (i.e. presented in monetary terms) to show the economic benefit associated with reductions in air pollution. The valuation of health improvements captures a number of economic effects, including the direct impact on the utility of the affected individual (commonly captured by the ‘willingness-to-pay’ of the individual to avoid the detrimental health outcome), reduction in medical costs and increase in productivity. Monetising the health impacts in this way is a common approach which allows the economic benefits of improved health outcomes to be compared to the costs of delivering the ULEZ in cost-benefit analysis.
- 8.1.6 Ricardo-AEA has employed the Department for Environment, Food and Rural Affairs Impact Pathway Approach Guidance to estimate the monetary values attributable to the impacts on health. The improved health outcomes arising from the reduction in NO_x, PM₁₀ and PM_{2.5} under the ULEZ for the GLA area are estimated to have a total monetised benefit of £101m in 2020 and £32m in 2025.
- 8.1.7 Improved air quality will also make central London a more pleasant place to work, live and visit. The impact on visitor numbers of this benefit cannot be quantified, but it is notable that Beijing (albeit with far greater problems than London) reported last year a significant decline in tourist numbers due to poor air quality (Associated Press, 2013) and shows that air quality is a factor for people deciding which locations to visit.
- 8.1.8 Any negative impact on London’s economy as a result of the proposed ULEZ (as identified in Table 8-B) is considered as minor-moderate. The main negative impact is anticipated to be on the night-time economy, where a potential impact of £20m or one to two per cent of turnover is possible, due to a proportion of owners of non-compliant cars being deterred from travelling into the proposed ULEZ. In addition, there will be a possible loss to the tourist sector of around £15m and there is a risk that some marginal commuter coach services may be lost.

8.1.9 The assessment of impacts from the ULEZ on the economy is in line with the impact of the congestion charge on London's economy.

IIA Objective – SMEs:

8.1.10 As set out in Chapter 7, there may be impacts on SMEs in particular sectors. These will be felt by SMEs that use older LGVs (e.g. independent retailers, catering outlets, market stall holders), coach operators, and parts of the tourism sector that are used by coach parties.

(a) HGVs

8.1.11 There may be an impact on SMEs. It is recommended that TfL works with representatives of SMEs in the freight industry in order to identify potential measures which could help to mitigate anticipated impacts.

(b) LGVs

8.1.12 This type of vehicle will be one of the hardest hit by the proposed ULEZ, due to the relatively small proportion of vehicles that will be compliant without further investment by operators. There may also be considerable impacts on some SMEs across a range of sectors.

8.1.13 To reduce these impacts, there are a number of possible mitigation factors that could be applied. For example, TfL could examine the feasibility of establishing consolidation centres on the edge of the proposed ULEZ with goods being transferred to low emission vehicles for onward movement into the ULEZ. This would probably best be linked to the general desire to reduce lorry movements in central London otherwise its use would decline as the proportion of vehicles becoming compliant with the ULEZ increases over time.

8.1.14 We therefore recommend that TfL works with SME representatives in those sectors of the economy that will most likely be impacted in order to identify potential measures which could help to mitigate anticipated impacts.

8.1.15 More generally, TfL should work with government to identify and assess ways, possibly including financial incentives, to assist with speeding up the replacement of older more polluting vehicles. For example, TfL could support more initiatives like Plugged in Fleets Initiatives (PiFi) which provided consultancy advice to businesses on switching to low emission electric or PHEVs.

(c) Cars

8.1.16 A similar scale of impact to that on the night-time economy is anticipated on SMEs (potential impact of £20m or one to two per cent of turnover). The impact will reduce as the proportion of compliant cars rises. Owners who need to replace vehicles to become compliant with ULEZ proposals are able to access the plug-in car and van grants from the OLEV. This is a grant of 25 per cent towards the cost of the vehicle, up to a maximum of £5,000, when purchasing a qualifying ultra-low emission car and registering it for the first time in the UK.

8.1.17 We note that the OLEV grants is only guaranteed until 2020 and OLEV have reserved the option to review the car grant value in 2017 or once 50,000 cars

have been sold, whichever comes sooner. TfL should continue to lobby for the extension of the existing OLEV grant beyond 2017.

8.1.18 The ongoing improvements to the coverage and frequency of night bus services and later London underground services will also help to offset this impact.

(d) Coaches

8.1.19 No impact is anticipated on long distance scheduled services. However, a proportion of local commuter services, sight-seeing vehicles and tourist coaches will not be compliant.

8.1.20 It may be appropriate for TfL to examine ways of working with the Government to provide financial assistance to operators of commuter coaches to replace non-compliant vehicles with compliant vehicles. This may be cheaper than providing additional capacity on the rail network to cope with displaced passengers.

(e) Taxis

8.1.21 Should a reduction in the taxi age limit be taken forward as a result of ULEZ, TfL will establish a specific fund for drivers of older taxis to help them switch to newer vehicles. Additional work will be undertaken to develop the exact details of the administration of the scheme prior to 2018, however, it is anticipated that grants would be offered to eligible taxi owners and that the proposed scheme would be phased from 2018 to smooth the impact of a reduced age limit in 2020. TfL will commission independent expert advice to develop the scheme further alongside discussions with the taxi trade.

(f) PHVs

8.1.22 The majority of minicab trips do not enter the proposed ULEZ and large fleet operators may have some flexibility in moving vehicles around, although as most drivers are self-employed, there may be earning implications for individuals. Therefore, while there will be an impact on individual drivers, the impact on the availability of minicabs in central London would be minor and hence no impact on SMEs.

8.1.23 Other PHV operators, in particular tour guides and those who operate contracts for local authorities, may use different types of vehicles to those commonly used for minicab purposes given the nature of the work they do and new vehicles that are compliant with the requirements for newly licensed PHVs may not be available in 2018 or may be too expensive for some PHV operators and drivers. The likely scale of impact on these operators is unable to be determined with the data available, but any impact is expected to be minor.

8.1.24 PHV operators and drivers who need to replace vehicles to become compliant with ULEZ proposals are able to access the plug-in car and van grants from the OLEV. We note that the OLEV grants is only guaranteed until 2020 and OLEV have reserved the option to review the car grant value in 2017 or once 50,000 cars have been sold, whichever comes sooner. TfL should continue to lobby for the extension of the existing OLEV grant beyond 2017.

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CAZ	Central Activities Zone
CCZ	Congestion Charging Zone
CO ₂	Carbon dioxide
DLR	Docklands Light Railway
DVLA	Driver and Vehicle Licensing Agency
EA	Environmental Assessment
EBIA	Economic and Business Impact Assessment
EQIA	Equality Impact Assessment
EU	European Union
GLA	Greater London Authority
GLAA	Greater London Administrative Area
GVA	Gross Value Added
HGV	Heavy Goods Vehicles
HIA	Health Impact Assessment
IIA	Integrated Impact Assessment
IRR	Inner Ring Road
LAEI	London Atmospheric Emissions Inventory
LEZ	Low Emission Zone
LGV	Light Goods Vehicles
LTDS	London Travel Demand Survey
MAQS	Mayor's Air Quality Strategy
MTS	Mayor's Transport Strategy
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
OLEV	Office for Low Emission Vehicles
PHV	Private Hire Vehicle
PM	Particulate Matter
SME	Small and Medium Sized Enterprise
TERM	Transport Emissions Roadmap
TfL	Transport for London
UK	United Kingdom
ULEZ	Ultra Low Emission Zone

Appendix 1 Age profiles of vehicles entering the CCZ (2013)

Year registered	Frequency of entry				Total
	0-49	50-99	100-249	250+	
Pre-1980	174	1	-	-	175
1980-1989	659	6	5		670
1990-1999	4,320	92	35	3	4,450
2000-2009	56,978	3,429	2,383	162	62,952
2010-2014	42,170	2,984	2,785	245	48,184
Grand Total	104,301	6,512	5,208	410	116,431

Table A-A HGVs age profile by frequency of entry in 2013

Year registered	Frequency of entry				Total
	0-49	50-99	100-249	250+	
Pre-1980	520	8	2	0	530
1980-1989	1,898	19	18	0	1,935
1990-1999	18,325	271	150	0	18,756
2000-2009	358,004	18,626	12,161	10	389,692
2010-2014	238,842	18,328	14,095	901	272,128
Grand Total	617,589	37,252	26,426	863	683,041

Table A-B LGVs age profile by frequency of entry in 2013

Year registered	Frequency of entry				Total
	0-49	50-99	100-249	250+	
Pre-1980	4,344	49	20	1	4,414
1980-1989	17,132	331	164	11	17,638
1990-1999	380,118	8,344	4,279	268	393,009
2000-2009	3,033,299	84,237	52,872	3,834	3,174,242
2010-2014	1,434,513	43,467	33,763	3,486	1,515,229
Grand Total	4,869,406	136,428	91,098	7,600	5,104,532

Table A-C Cars age profile by frequency of entry in 2013