An analysis of road freight in London and Britain: traffic, activity and sustainability

by

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Carried out as part of the FTC2050 project

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ABOUT THE FREIGHT TRAFFIC CONTROL 2050 (FTC2050) PROJECT

This report has been produced as part of a research project entitled "Freight Traffic Control 2050 (FTC2050): Transforming the energy demands of last-mile urban freight through collaborative logistics". It is an EPSRC-funded project that began in April 2016 and will run for 36 months.

Freight transport currently makes up around 16% of all road vehicle activity in our cities and by 2030, the EU would like to see largely CO2-free logistics systems operating in our urban centres. With van traffic predicted to increase by 20% in London by 2030, and the uptake of alternatively fuelled and electric goods vehicles slow, more radical strategies are needed to reduce the numbers and impacts of freight vehicles in our cities.

Working with parcel carriers in London, this project will examine the potential for closer operational collaboration between carriers to reduce urban traffic and energy demand whilst maintaining customer service levels, and evaluate to what extent such relationships can develop naturally within a commercial setting or whether a 3rd party 'Freight Traffic Controller' (FTC) would be necessary to ensure equitable distribution of demand across a city. The key research objectives are to:

1. Investigate the collective transport and energy impacts of current parcel carrier activities in urban areas;
2. Create a database to gather and interrogate collection and delivery schedules supplied by different carriers;
3. Use the data with a series of optimisation algorithms to investigate the potential transport and energy benefits if carriers were to share deliveries and collections more equitably between them and develop tools to help visualise those benefits;
4. Evaluate what business models would be needed to enable carriers to collaborate in this way;
5. Investigate the role a 3rd party 'Freight Traffic Controller' could play in stimulating collaboration between carriers to reduce energy demand and vehicle impacts across a city;
6. Identify the key legal and privacy issues associated with the receipt, processing and visualisation of such collaborative schedules;
7. Consider the wider application of this approach to other sectors of the urban freight transport market.

The project is a multidisciplinary collaboration, led by the University of Southampton's Faculty of Engineering and the Environment (CEE), and involving the Southampton Business School (SBS), Lancaster University's School of Computing and Communications and Data Science Institute (LU), the University of Westminster's Faculty of Architecture and the Built Environment (UoW) and University College London's Bartlett Centre for Advanced Spatial Analysis (CASA). Two major carriers (TNT and Gnewt Cargo, (the latter operating for DX and Hermes)) have agreed to participate in the research along with Transport for London (TfL).

For further information about the FTC2050 project please visit the project website at:
http://www.ftc2050.com/

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1. INTRODUCTION

This report consists of a review and analysis of road traffic, road freight activity, and road freight sustainability in London and Britain. The sustainability issues investigate goods vehicle involvement in traffic casualties, and CO_2 and air pollution emissions. It has been carried out as part of the EPSRC-funded FTC2050 project.

Section **2** presents information and data about current and past road traffic levels and operating patterns in Britain and London, with a specific focus on light- and heavy goods vehicle (LGV and HGV) activities.

Section **3** considers road traffic casualties in London and Britain arising from collisions with LGV and HGV involvement.

Section **4** presents LGV and HGV involvement in CO2 and air pollution in London and Britain.

Section **5** analyses road freight activity in London and Britain using HGVs.

Section **6** analyses road freight activity in London and Britain using LGVs.

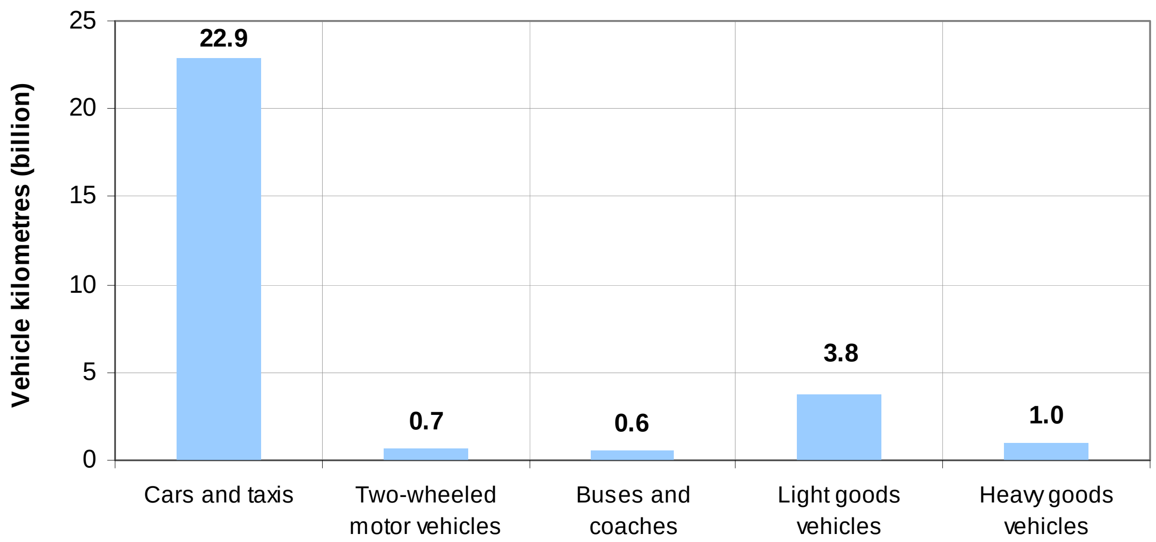
2. ROAD TRAFFIC ACTIVITY IN LONDON AND BRITAIN

2.1 Importance of goods vehicle traffic

A significant proportion of all vehicles on London's roads are freight vehicles which accounted for 17 per cent of all vehicle kilometres in 2012 (Allen et al., 2014). LGVs and HGVs accounted for 13 per cent and 4 per cent respectively of all vehicle kilometres travelled on London's roads in 2012 (see **Figure 2.1**). Goods vehicles are second only in scale of activity to car traffic in London. This data is based on vehicle movements; if it were based on equivalent Passenger Car Units (PCUs) then HGVs would approximately double in importance (Allen et al., 2014).

In terms of the 4.8 billion vehicle kilometres travelled by goods vehicles on London's roads in 2012, 80 per cent were performed by light goods vehicles (i.e. up to and including 3.5 tonnes gross weight - LGVs), and 20 per cent by heavy goods vehicles (i.e. over 3.5 tonnes gross weight – HGVs). Of this 20 per cent of goods vehicle kilometres performed by HGVs, 15 per cent were accounted for by rigid HGVs and 5 per cent by articulated HGVs (Allen et al., 2014).

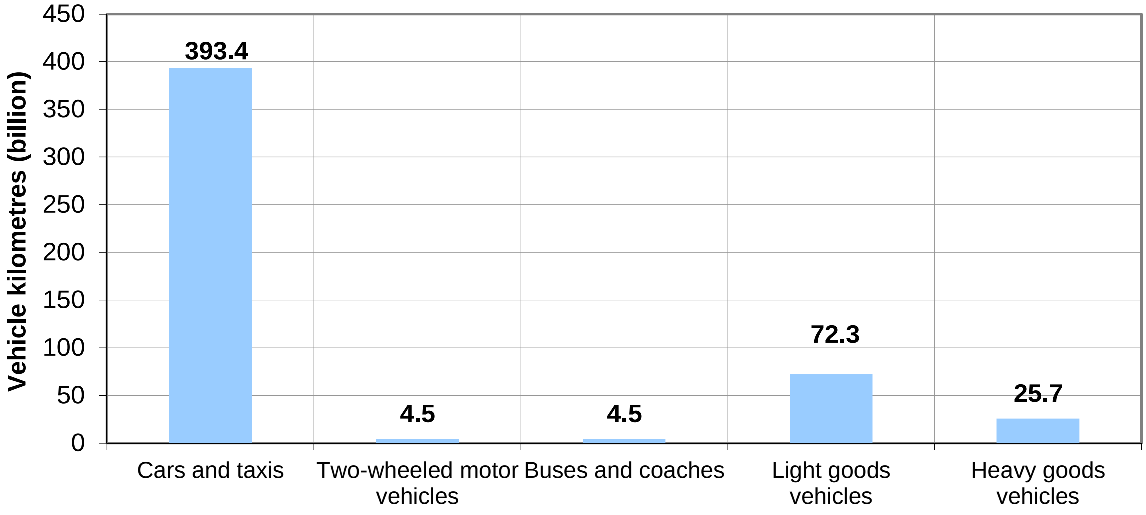
Figure 2.1: Total vehicle kilometres travelled in London by vehicle type, 2012



Note: based on DfT traffic data.
Source: TfL, 2014.

By comparison, in Britain as a whole, goods vehicles accounted for 19 per cent of all vehicle kilometres travelled by motorised vehicles in 2014 (DfT, 2015a). LGVs and HGVs accounted for 14 per cent and 5 per cent respectively of all vehicle kilometres travelled on British roads (see **Figure 2.2**).

Figure 2.2: Total vehicle kilometres travelled in Britain by vehicle type, 2014



Note: based on DfT traffic data.
Source: DfT, 2015a.

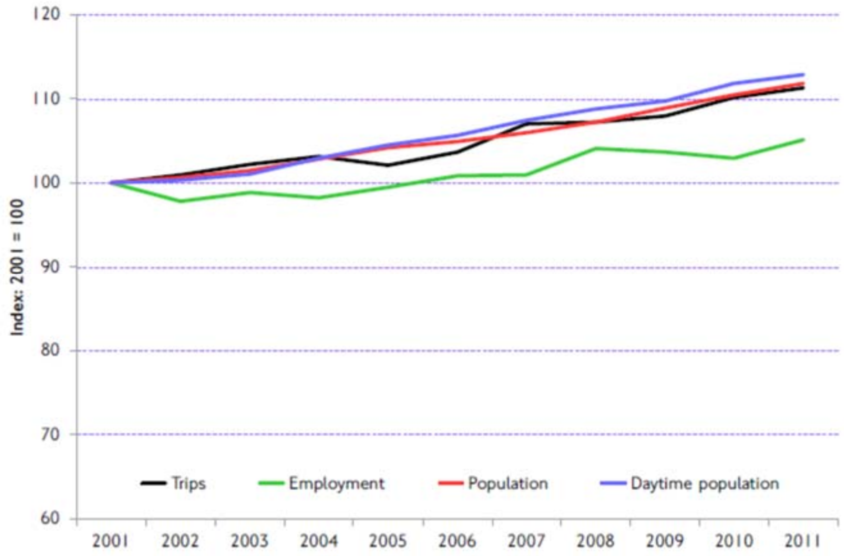
2.2 Changes in motorised road traffic levels

The Roads Task Force has summarised the changes in levels of all motorised traffic in London over the last decade (Roads Task Force, 2013a):

- "Motorised traffic volumes in London peaked in 1999, and have been falling steadily ever since.
- Annual motorised vehicle kilometres in London in 2011 were 11 per cent below the 1999 peak, despite a 15 per cent increase in London's population and a 14 per cent increase in total travel (trips) over this period.
- Motorised traffic declined at a faster rate in central London, down by 21 per cent since 2000. The equivalent falls in inner and outer London (where about 97 per cent of London's motorised traffic occurs) were 13 per cent and 8 per cent respectively.
- In contrast, motorised traffic in Great Britain continued to grow until 2007. Following three years of small declines to motorised traffic levels, GB traffic started to grow again in 2011.
- Since 2000, cars (including minicabs) have decreased – down by 37 per cent at the Central traffic counting cordon. 13 per cent at the Inner cordon and 2 per cent at the Outer cordon".

These reductions in motorised traffic levels in London have been occurring at a time when the population was increasing. Between 1991 and 2011, the population of London grew at an average rate of nine people per hour. This is expected to rise to 11 new Londoners per hour between 2011 and 2021 (GLA, 2016). The Roads Task Force noted the relationship between passenger travel demand, population size and economic growth; it shows that London's population grew by 13 per cent between 2000 and 2011, and that there were 13 per cent more trips made in London on an average day in 2011 compared to 2000 (see **Figure 2.3**).

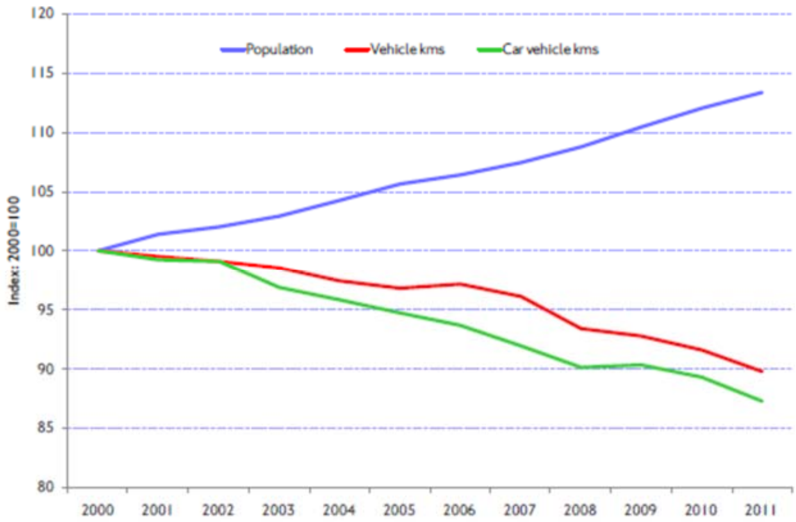
Figure 2.3: Relationship between population, employment and travel demand in London



Source: Roads Task Force, 2013b.

However there is no such relationship between population size and total motorised vehicle activity. While London's population has been increasing over the last decade total motorised vehicle kilometres travelled and those travelled by car has been falling (see **Figure 2.4**). This is explained by falling levels of car use and increases in road and non-road public transport.

Figure 2.4: Population and traffic growth in London, index: 2000=100



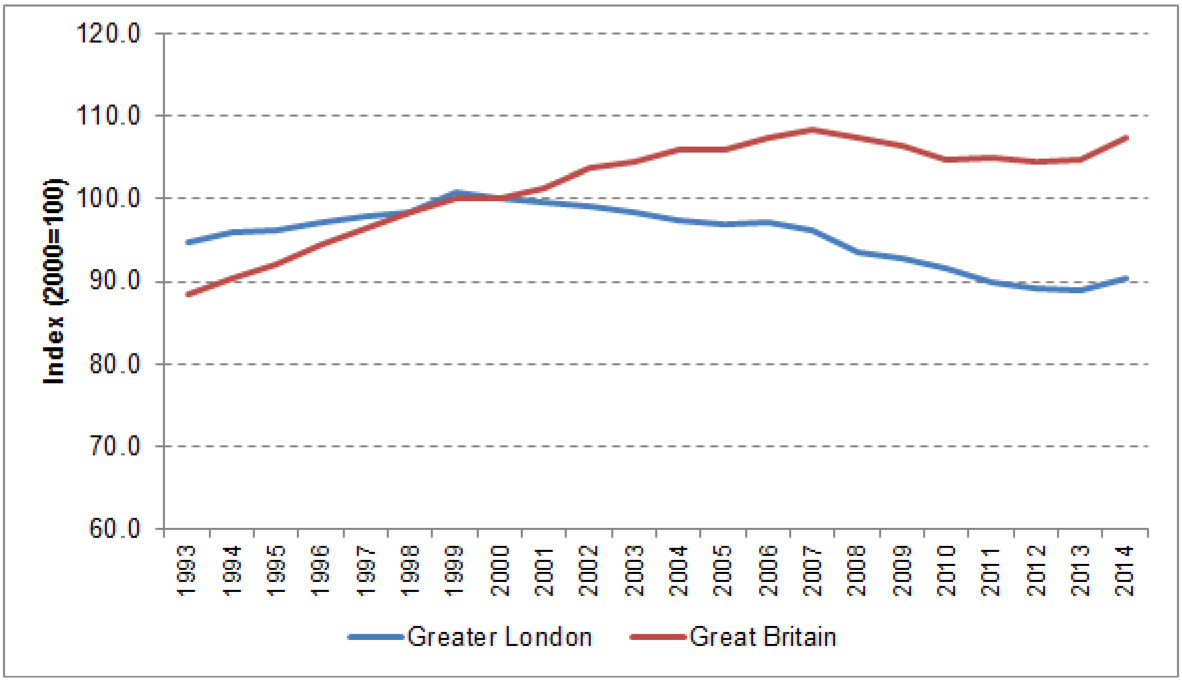
Source: Roads Task Force, 2013a.

Figure 2.5 shows changes over time in motorised traffic levels in London and the whole of Great Britain between 1993 and 2014. This shows that while motorised traffic levels continuously fell in London between 2000 and 2013, they continued to rise at a national level until the onset of the recession in 2008, after which they fell until 2014. Road traffic levels rose in both London and Britain in 2014.

In 2014, total motorised road traffic in London as a whole increased for the first year since 2006. The annual rise was 1.8 per cent across London as a whole, and 3.4 per cent in central London. Road traffic in outer London has increased for three consecutive years since 2011 (TfL, 2016a). However, despite these recent increases, total motorised road traffic in London as a whole in 2014 was 9.5 per cent lower than in 2000, and was 21.3 per cent lower in central London (TfL, 2016a).

At a national level, motorised road traffic grew by 2.4 per cent in 2014, and was 7.4 per cent higher in 2014 than in 2000. There is therefore a clear difference between motorised road traffic trends in London and Great Britain as a whole over the last 15 years.

Figure 2.5: Motorised road traffic trends, London and Great Britain 1993-2014 (Index 2000 = 100)



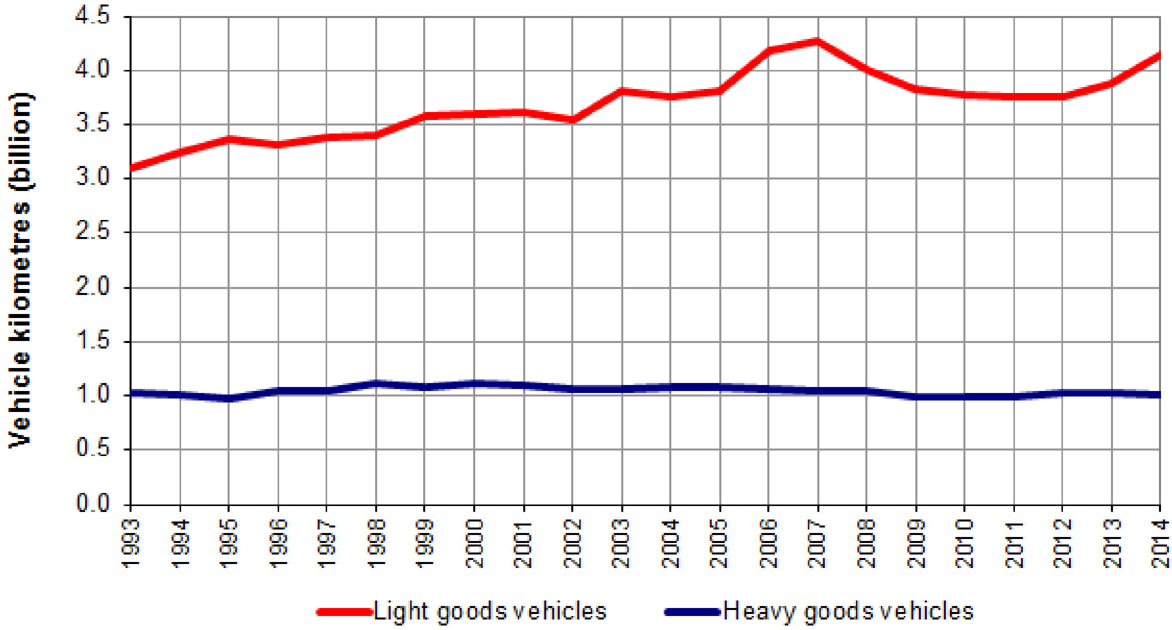
Source: TfL, 2014; TfL, 2016a; DfT, 2015a.

Therefore, between 2000 and 2014 there were reductions in traffic demand in London (of approximately 10 per cent across London, 23 per cent in central London, 17 per cent in inner London and 6 per cent in outer London) (TfL, 2016a). However despite this reduction in traffic levels, "there has been a long term historic trend towards increasing congestion on London's roads reflected in part by falling speeds. Over much of the last decade congestion increased despite falling traffic levels. This reflected the progressive removal of 'effective capacity' for general traffic to be used to prioritise public transport, and urban realm improvements, among other factors" (Roads Task Force, 2013c). TfL has "calculated the proportion of network capacity for private motorised trips lost relative to 1996. This is estimated to be 30 per cent in central London, 15 per cent in inner London and 5 per cent in outer London" (Roads Task Force, 2013d) (see **section 2.6** for further discussion of congestion in London).

2.3 Changes in goods vehicle traffic levels

Unlike car traffic, LGV traffic in London measured in vehicle kilometres continued to grow in London between 2000 and 2007, the fell during the recession between 2007 and 2011, since when it has risen again (Travel Report 8). Total LGV kilometres travelled in London in 2014 were 10 per cent higher than their 2011 low point, and were 15 per cent higher than in 2000 (see **Figure 2.6**). By contrast, total HGV vehicle kilometres travelled in London were 9.5 per cent lower in 2014 than in 2000 (see **Figure 2.6**).

Figure 2.6: Vehicle kilometres travelled by goods vehicles on all roads in London, 1993-2014

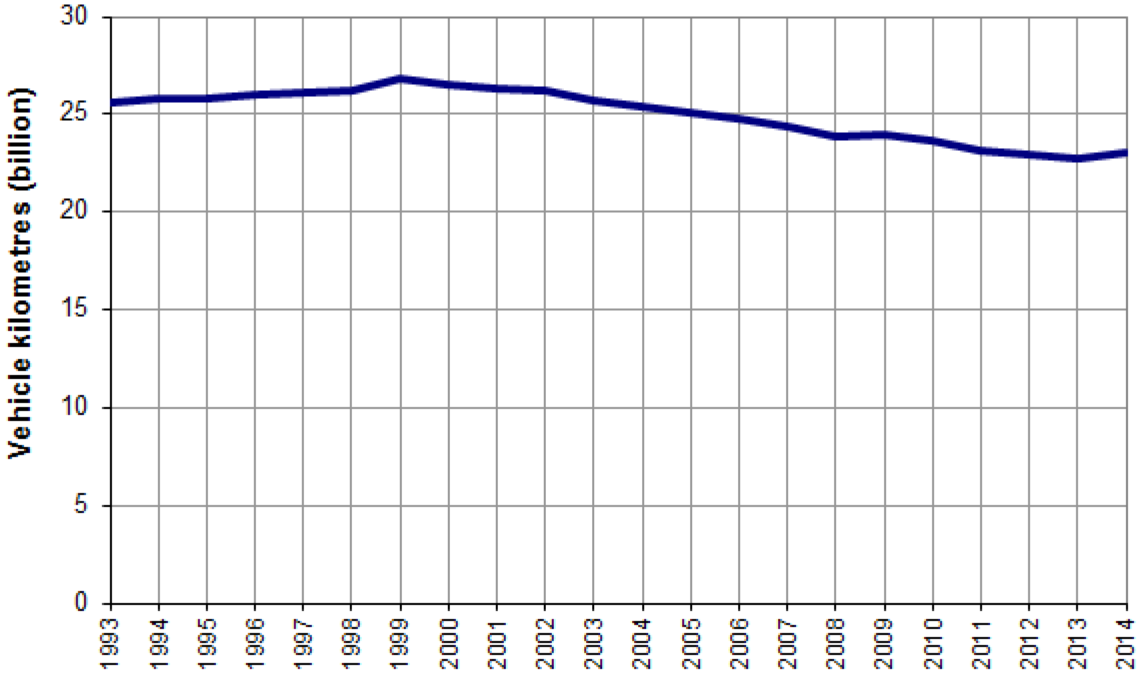


Note: based on DfT traffic data.
Source: TfL, 2014; TfL 2016.

Growing urban populations generate an increase in the demand for goods and services that have to be delivered and distributed in often very congested municipal areas. In London, and other towns and cities in Britain, not only is the absolute volume of urban freight growing, but also the nature of these movements has changed dramatically in recent years, resulting in significant challenges facing logistics operators supplying goods and services in urban areas.

Figure 2.7 shows the indexed total vehicle kilometres travelled by cars and taxis on London's roads over the same period. This indicates that in 2014 car and taxi traffic in London was approximately six times greater than LGV traffic and 23 times greater than HGV traffic. However, since 2000, car and taxi traffic in London has fallen in both absolute and relative terms.

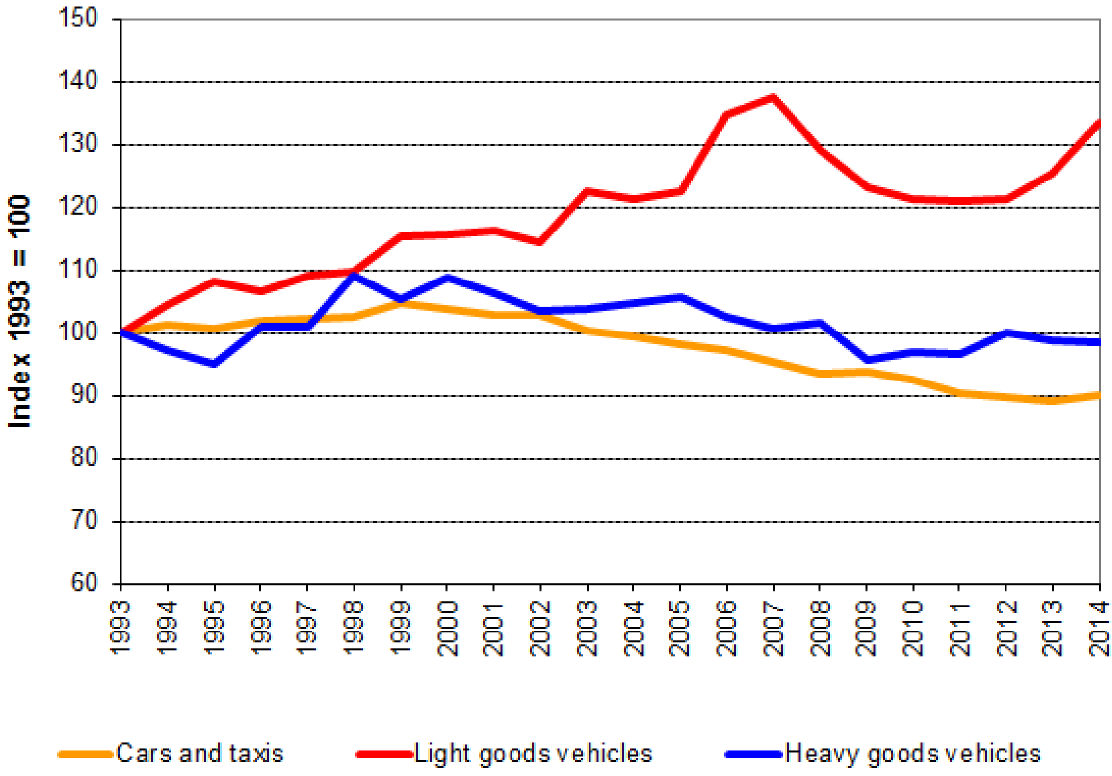
Figure 2.7: Vehicle kilometres travelled by cars and taxis on all roads in London, 1993-2014



Note: based on DfT traffic data.
Source: TfL, 2014; DfT, 2015b.

Figure 2.8 shows the relative change in traffic levels on London's roads between 1993 and 2014. This shows that LGV traffic was greater in 2001 than in 1993 while HGV and car traffic was lower. Car traffic began to fall after 1999 and continued to do so until 2012 after which it became stable, while in the case of HGV traffic this fall commenced in 2000. LGV traffic continued to increase until 2007, falling back somewhat thereafter, and then rising sharply again since 2012.

Figure 2.8: Vehicle kilometres travelled in London, 1993-2014 (index 1993 = 100)

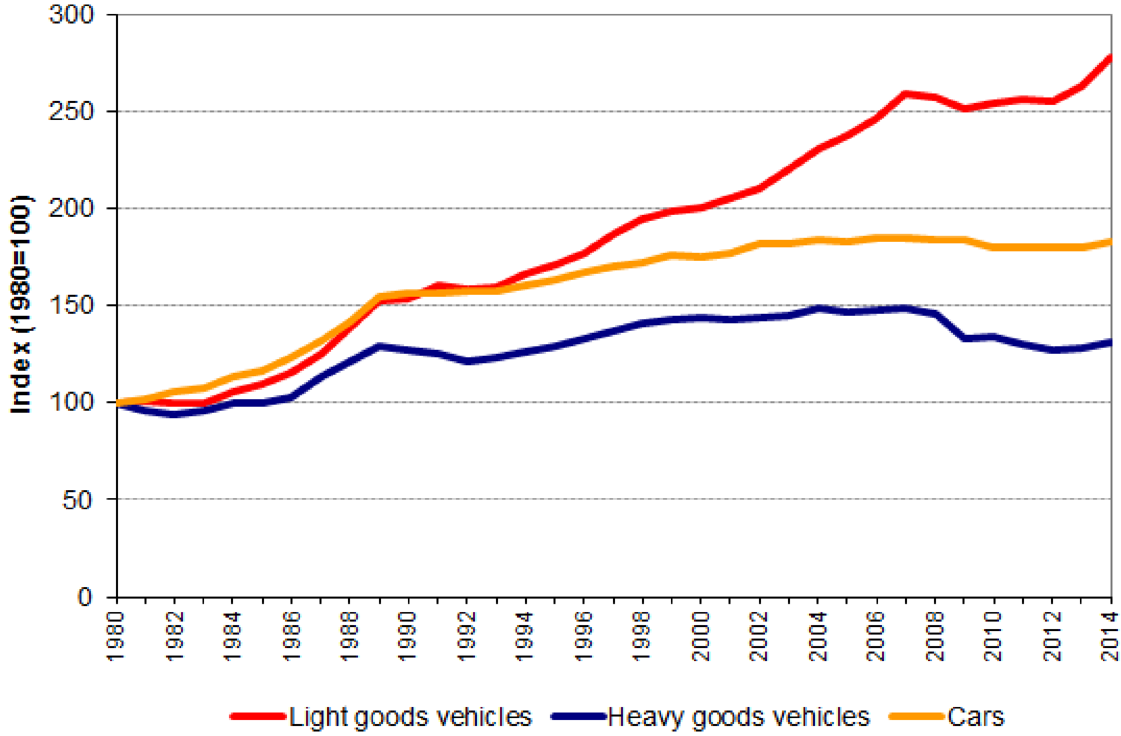


Note: based on DfT traffic data.
Source: calculated from data in TfL, 2014; TfL, 2016a; DfT, 2015b.

Figure 2.9 shows the national trend in car, LGV and HGV traffic in Britain since 1980. This indicates that, as is the case in London, from 1990 until the onset of the recession in 2008, LGV traffic grew far more strongly than car and HGV traffic.

Possible reasons for the major increase in LGV traffic over the last two decades include economic growth and rising employment, population growth and the growth in the number of households (as average household size falls), the relative lack of regulations governing LGV use compared with HGVs, the rise in online shopping, the move towards just-in-time deliveries, growth in demand for express and parcels services (from business and residential customers), growth in the service sector, the outsourcing of service functions, the development and use of technological and communications equipment (with its inherent maintenance and repair requirements) (CfIT, 2010). Since 2012 LGV traffic has begun to increase sharply again, while car and HGV traffic has remained relatively stable.

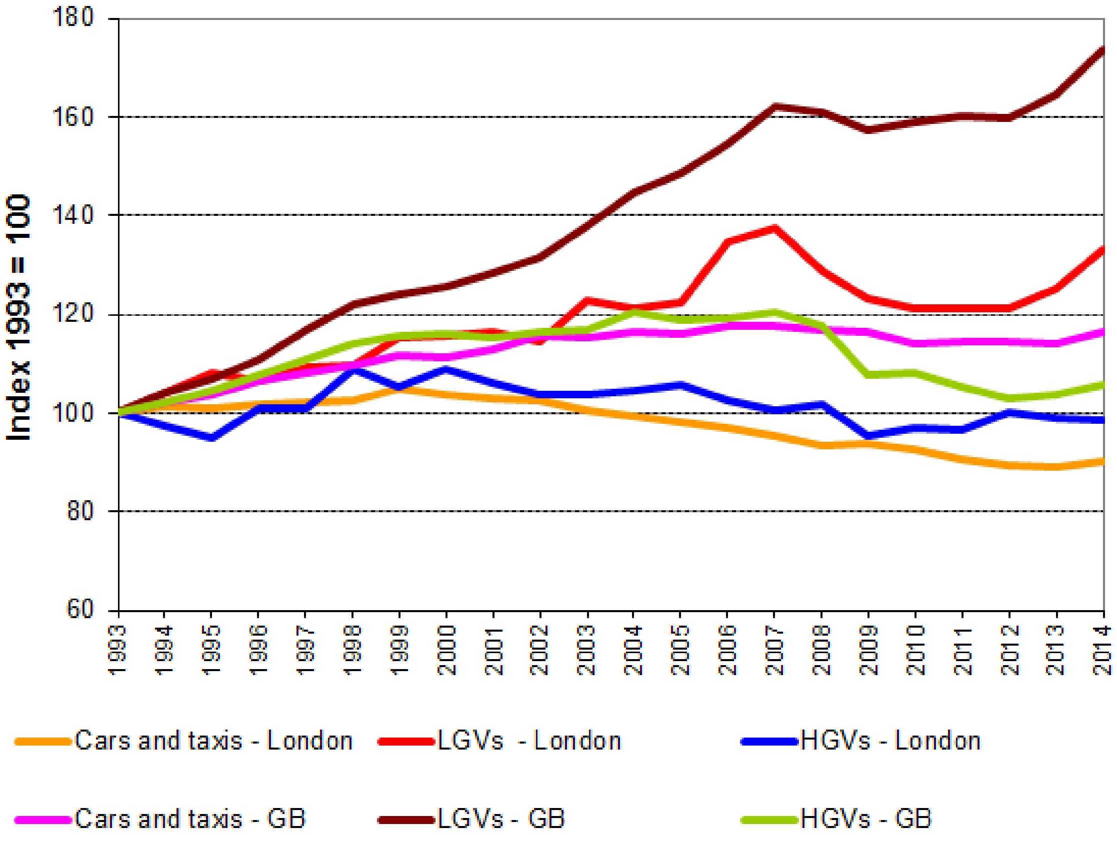
Figure 2.9: Vehicle kilometres travelled in Britain 1980-2014 (index 1980 = 100)



Source calculated from data in DfT, 2015a.

Figure 2.10 and Table 2.1 compare changes in road traffic for LGVs and HGVs and cars in London and nationally (i.e. Britain). The data shows that LGV traffic growth nationally has outpaced LGV traffic growth in London over the period since 1993. Meanwhile, HGV traffic in Britain grew between 1993 and 2007 and then fell back, while in London it began to fall from 2000 onwards. Since 2009 it has increased a little in London, but has remained largely stable in Britain as a whole. Car traffic at the London and national level exhibited a similar pattern to HGV traffic (i.e. starting to diminish in London far earlier than nationally, and being below the 1993 level in London 2014 but remaining above the 1993 level nationally (TfL, 2014; TfL, 2016a; DfT, 2015a; DfT 2015b).

Figure 2.10: Vehicle kilometres travelled in London and Britain 1993-2014 (index 1993 = 100)



Note: based on DfT traffic data.
Source: calculated from data in TfL, 2014; TfL, 2016a; DfT, 2015a; DfT 2015b.

Table 2.1: Vehicle kilometres travelled in London and Britain 1993-2014 (index 1993 = 100)

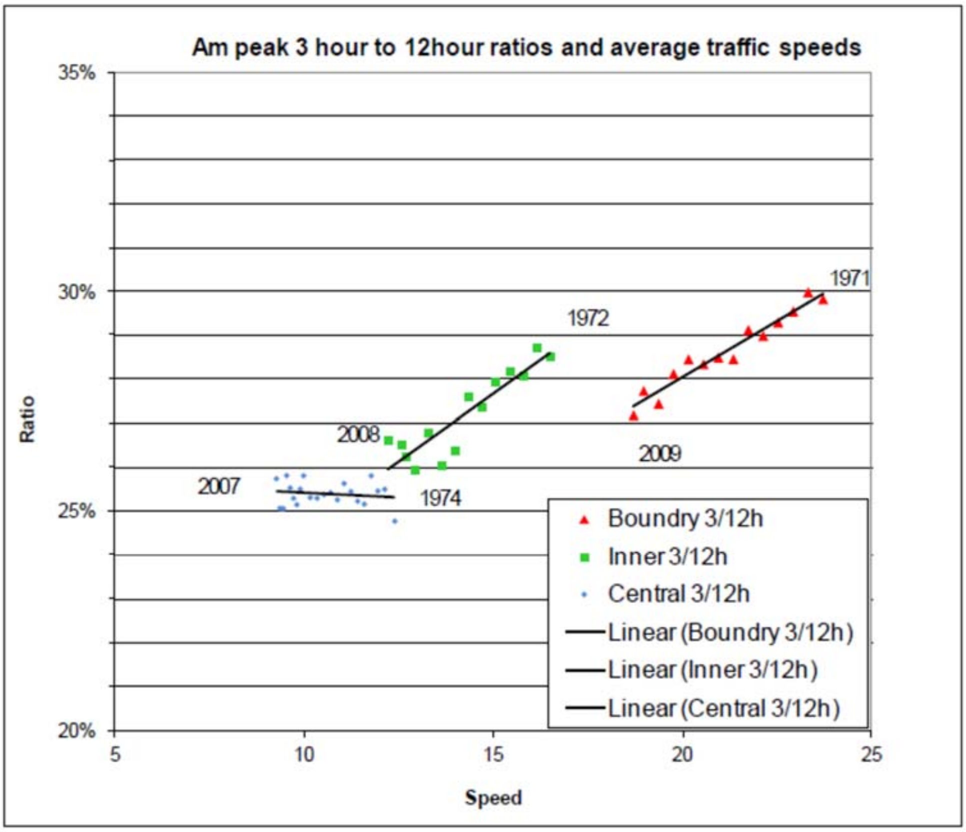
	London			Great Britain		
Year	**Cars and taxis**	**LGVs**	**HGVs**	**Cars and taxis**	**LGVs**	**HGVs**
1993	100	100	100	100	100	100
1994	101	104	97	102	104	102
1995	101	108	95	104	107	105
1996	102	107	101	106	111	108
1997	102	109	101	108	117	111
1998	103	110	109	110	122	114
1999	105	115	105	112	124	116
2000	104	116	109	111	125	116
2001	103	116	106	113	128	115
2002	103	114	104	116	131	116
2003	100	123	104	115	138	117
2004	99	121	105	117	145	121
2005	98	123	106	116	149	119
2006	97	135	103	118	155	119
2007	95	138	101	118	162	121
2008	93	129	102	117	161	118
2009	94	123	95	117	157	108
2010	93	121	97	114	159	108
2011	90	121	96	115	160	105
2012	90	121	100	114	160	103
2013	89	125	99	116	165	104
2014	90	133	98	116	174	106

Note: based on DfT traffic data.
Source: calculated from data in TfL, 2014; TfL, 2016a; DfT, 2015a; DfT 2015b.

2.4 Vehicle activity by time of day in London

"There is evidence of 'peak spreading' for motorised traffic on London's roads. As demand approaches capacity in the peaks, drivers increasingly elect to travel at off-peak times, although lifestyle factors such as increasing leisure trips and more flexible working will also be a factor. Motorised traffic volumes in the peaks therefore remain stable or fall, and the proportion of daily traffic during off-peak hours increases" (Roads Task Force 2013a). **Figure 2.11** shows this peak spreading trend together with falling traffic speeds for all motorised traffic in inner and outer London over the past 40 years. It should be noted that the trend for central London is flat – central London has experienced 'all-day' congestion for the entire period (Roads Task Force 2013a).

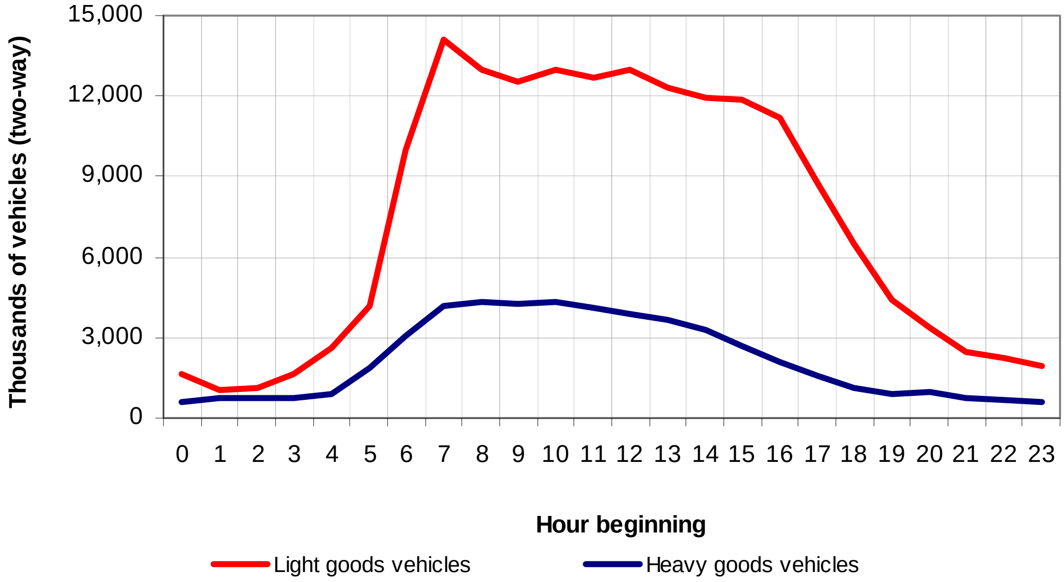
Figure 2.11: Peak spreading – ratio of 3 hour AM peak period flows to 12 hour (daytime) flows



Source: Roads Task Force, 2013a.

Despite this peak spreading across motorised traffic as a whole, LGV and HGV traffic in London does still exhibit a peak, from approximately 07:00 to 12:00. **Figure 2.12** shows goods vehicle traffic entering and leaving the central London traffic cordon. Similar morning peaks in goods vehicle traffic occur at the inner and outer London cordon boundaries.

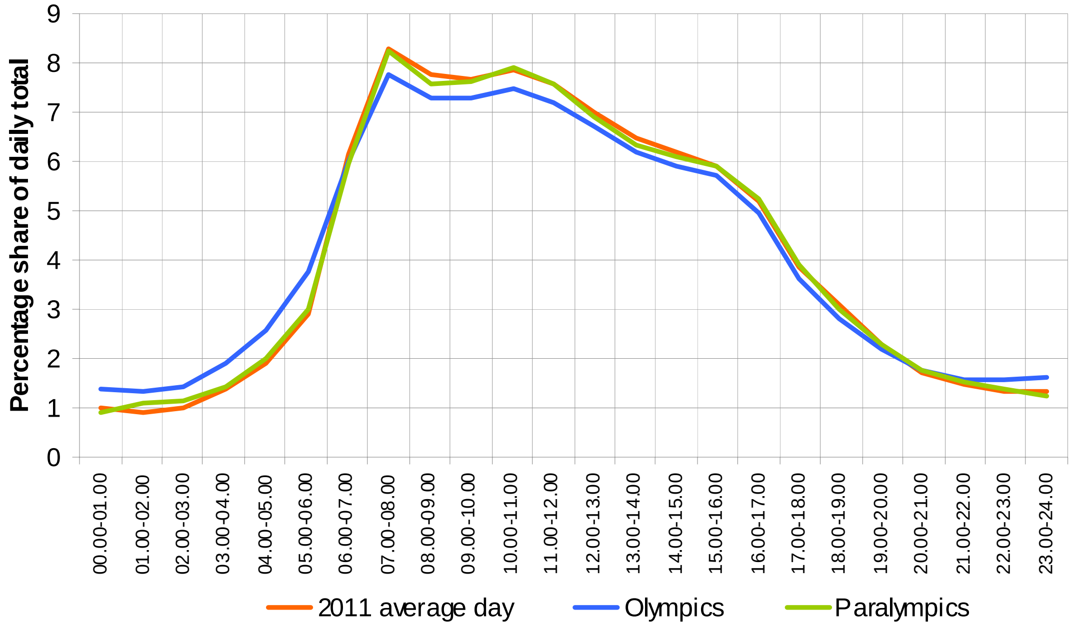
Figure 2.12: Goods vehicles crossings at the Central cordon by time of day, 2012



Source: TfL, 2014.

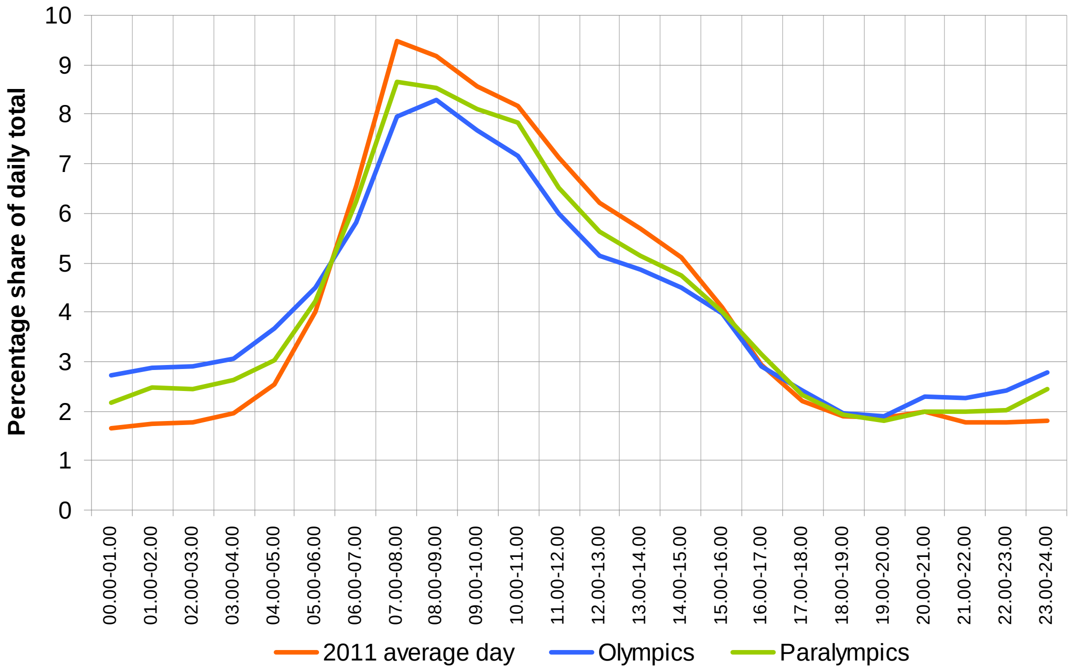
At present the vast majority of goods delivery and collection and servicing activity takes place in London during the daytime. Only approximately 15-20 per cent of LGVs and HGVs enter outer, inner and central London between the hours of 19:00 and 06:00. However, during the London Olympics and Paralympics, as a result of road restrictions introduced and advice issued, there was a relative shift towards a greater proportion of LGV and HGV journeys being made in London between 20:00 and 06:00, with this shift most marked in central London (see **Figures 2.13 and 2.14**).

Figure 2.13: LGVs entering and leaving the Central London Congestion Charging Zone by time period



Note: Each line sums to 100 per cent. ANPR camera data (normalised).
Source: TfL, 2013a.

Figure 2.14: HGVs entering and leaving the Central London Congestion Charging Zone by time period

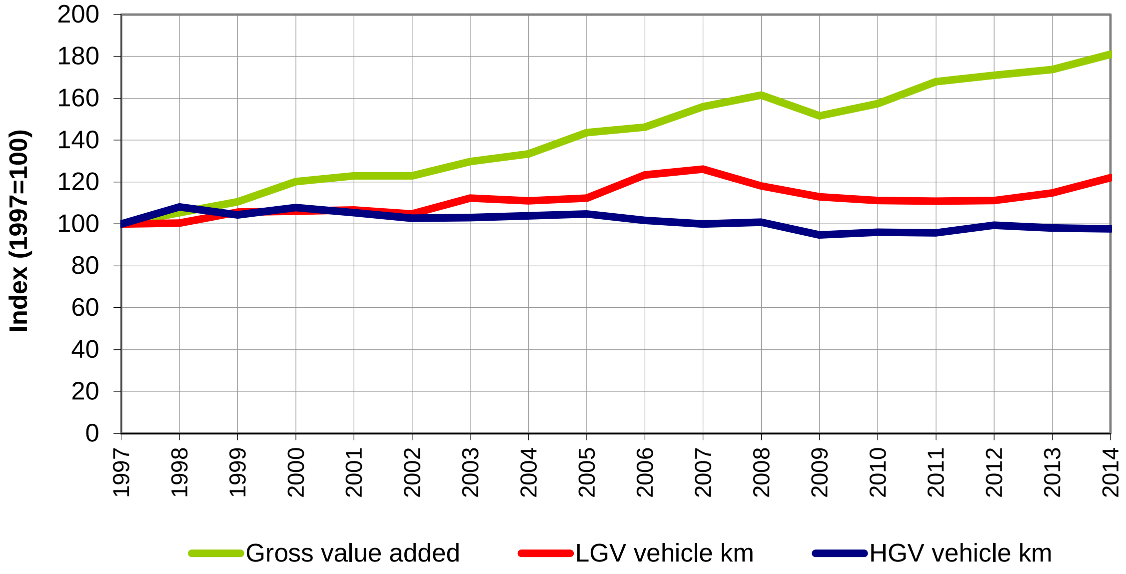


Note: Each line sums to 100 per cent. ANPR camera data (normalised).
Source: TfL, 2013a.

2.5 Goods vehicle traffic and economic growth

Figure 2.15 shows the relationship between changes in the size of London's economy (as measured by Gross Value Added – GVA) and in LGV and HGV activity on London's roads. This shows that over the period 1997-2014 GVA has outpaced LGV traffic growth. GVA has grown over the entire period with the exception of 2007. LGV traffic grew between 1997 and 2007, then fell until 2010, and has then risen again since 2012. By comparison, HGV traffic has remained relatively stable over the entire period, suggesting a decoupling in London between HGV activity and economic growth as has happened in Britain as a whole (see **Figure 2.16**). Figure 2.15 indicates that London's economy has become less road freight (i.e. LGV and HGV) traffic intensive per unit of economic output over the entire period. This is sometimes referred to as "decoupling" between economic growth and goods vehicle activity. This decoupling has been attributed to several factors including: i) the changing composition of UK GDP (from manufacturing to services which generate less freight per unit of output), ii) the slowing of geographical trends that have traditionally been the main drivers of freight traffic growth as indicated by increases in the average length of haul (centralisation of production and warehousing and wider sourcing patterns), and iii) the off-shoring of manufacturing (and its upstream supply chains) to low labour cost countries (McKinnon, 2009). It could also be influenced by two other trends: i) the lightweighting of products – in which the average bulk density of goods diminish (but average value densities can increase) as a result of changes in industrial structure and the commodity mix required, and the substitution of lighter materials for heavier ones, and ii) the dematerialisation of products in which goods that were formally manufactured and transported through supply chains to points of sale have become electronic (e.g. book and music). These goods still therefore contribute to GDP but no longer require physical transportation.

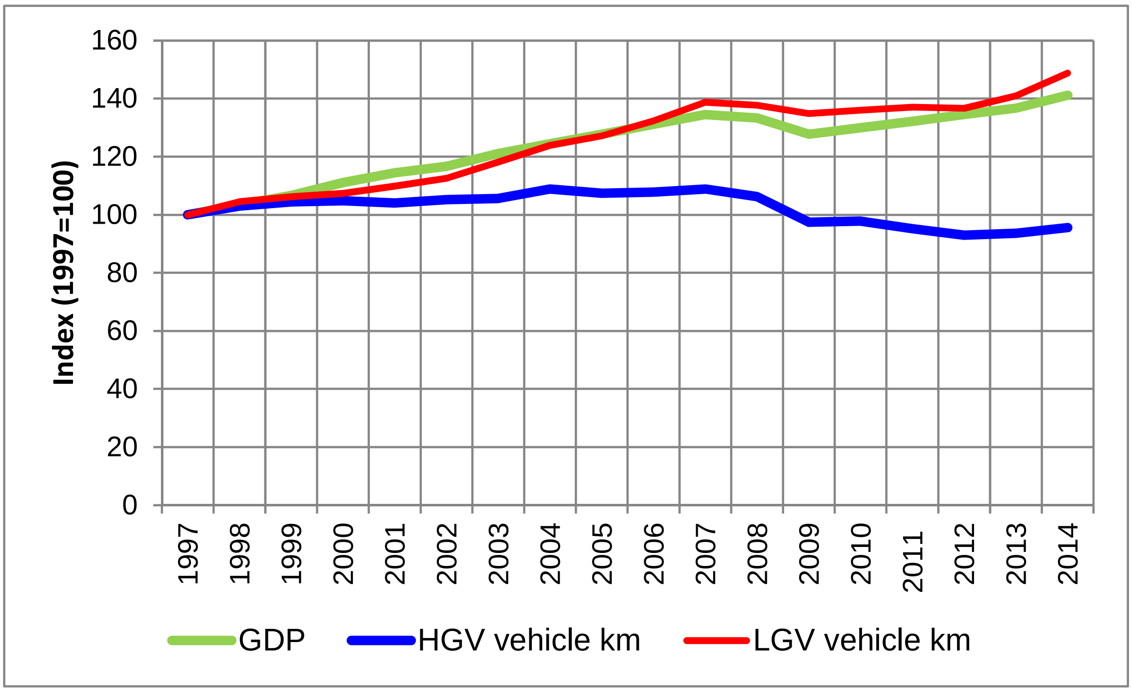
Figure 2.15: Comparison of Gross Value Added and goods vehicle kilometres in London, 1997-2014



Source: GLA, 2015; TfL, 2014; TfL 2016.

Figure 2.16 shows a comparison of Gross Domestic Product and LGV and HGV vehicle kilometres for Britain between 1997 and 2014. As in the case of London (**Figure 2.15**) this shows a marked decoupling between economic growth and HGV vehicle activity in Britain over the period. However, in the case of LGV vehicle activity in Britain this can be seen to have largely mirrored Gross Domestic Product over the entire period.

Figure 2.16: Comparison of Gross Domestic Product, LGV and HGV vehicle kilometres in Britain, 1997-2014



Source: DfT, 2015c; DfT, 2015d.

2.6 Congestion, travel reliability, delays and speed in London

London has been subject to worsening road conditions and difficulties in finding suitable kerbside parking space both of which make the performance of freight transport ever-more difficult to perform in the timely manner required. Average traffic speeds in London have been declining at all time periods of the day between 2008/9 and 2014/5. These deteriorations in average traffic speeds have ranged between 2% and 9%, depending on time period and location. Average traffic speeds in central London in 2014/5 were 13.6 km per hour (Transport for London, 2016).

Road traffic vehicle delays in London have also risen over this same time period by between 17-31% in central London (varying in severity by time of day). In central London the average traffic delay in central London varies between 1.9 minutes per km travelled in the morning peak and 2.5 minutes per km travelled in the daytime inter-peak (Transport for London, 2016). Journey time reliability has also deteriorated over this period as a result of rising traffic volumes and increased disruption on the network.

Local depots from which to operate freight deliveries and collections and servicing activity in inner and central London are becoming increasingly difficult to afford, due to sharp increases in land values. This is leading to the suburbanisation and ex-urbanisation of these freight facilities from which goods vehicles operate, which increases journey distances and times for London operations (Broaddus et al., 2015).

Roadspace reallocation has taken place in London over the last two decades as a result of the expansion of exclusive bus and cycle lanes as well as some pavement widening programmes. For example, dedicated bus lanes in the Congestion Charging Zone in central London increased from 24.5 miles in 2003 to 26.5 in 2007 (Barry, 2014). In addition, bus and cycle traffic priority schemes and junction redesign for safety purposes including the implementation of more advance stop lines have also contributed to reduced traffic speeds. For example, signals were retimed and new crossings installed to prioritise pedestrian safety. These measures contributed to a 30% decrease in the road network capacity in central London for private motorised vehicles between 1993 and 2009 (TfL, 2013b). In addition TfL has "calculated the proportion of network capacity for private motorised trips lost relative to 1996. This is estimated to be 30 per cent in central London, 15 per cent in inner London and 5 per cent in outer London" (Roads Task Force, 2013d).

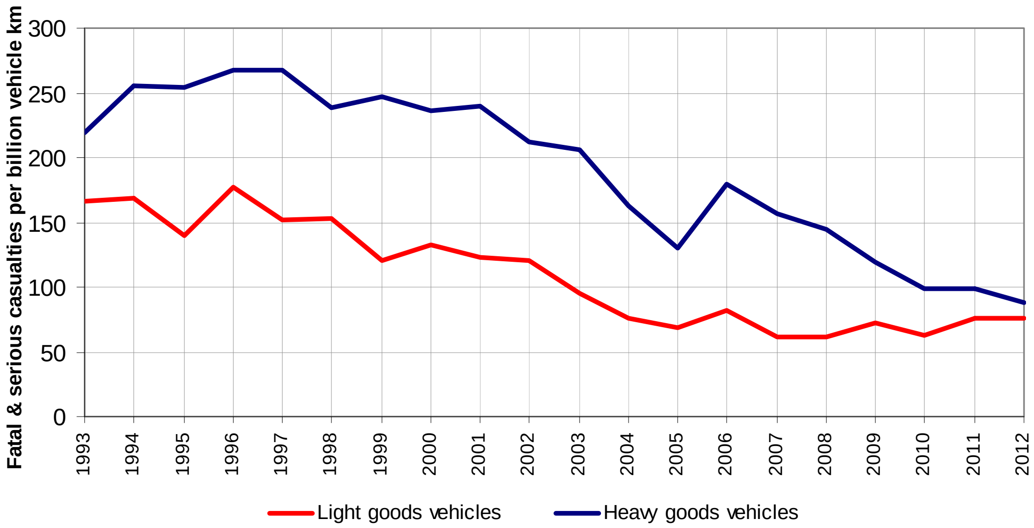
TfL is expecting traffic congestion to increase in future as a result of further pressures on roadspace from cycling and bus infrastructure, together with growth in some types of vehicle activity including LGVs. As a result TfL is planning for a future in which by 2031 current traffic congestion in central, inner and outer London has risen by 60%, 25% and 15% respectively (TfL, 2015).

3. GOODS VEHICLE ACTIVITY AND ROAD SAFETY IN LONDON AND BRITAIN

3.1 Goods vehicle activity and casualties in London

Figure 3.1 shows the fatal and serious casualties in London per billion vehicle km that involved LGVs and HGVs from 1993 to 2012. The rate can be seen to have fallen for HGVs over the entire period, while for LGVs it fell until 2007, since when it has risen slightly.

Figure 3.1: Fatal and serious casualties per billion vehicle kilometres in London, 1993-2012



Source: calculated from data provided by TfL, 2014.

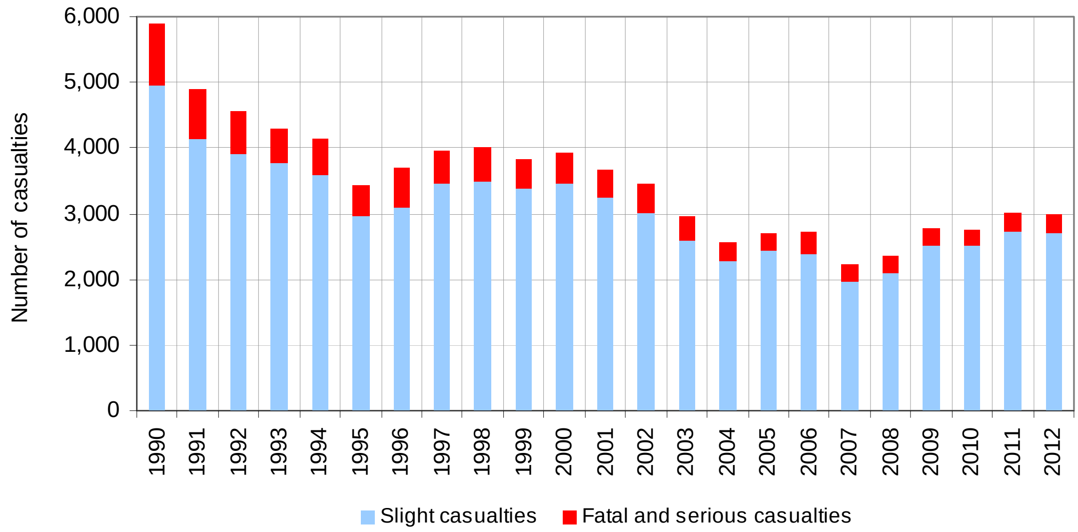
LGVs were responsible for 13 per cent of total motorised vehicle kilometres on roads in London in 2012, and were involved in collisions that resulted in 10 per cent of total road traffic casualties, 9 per cent of killed and seriously injured casualties, and 13 per cent of total road traffic fatalities in London in 2012 (Allen et al. 2014).

The number of fatal and serious injuries in collisions involving LGVs in London per vehicle kilometre travelled was 9 per cent higher in 2012 than the 2005-2009 annual average. The number of slight casualties in collisions involving LGVs per vehicle kilometre travelled was 26 per cent higher (Allen et al. 2014).

In 2012, 284 people were killed and seriously injured in collisions involving LGVs in London (compared with the 2005-9 average of 278 people). Of these, there were 17 fatalities in 2012 (compared with the 2005-9 average of 15 fatalities) Of the 17 fatalities resulting from collisions involving LGVs in 2012, 11 were pedestrians, 1 was pedal cyclists, 4 were motorcyclists, and 1 was a car occupant (Allen et al. 2014).

Compared with the 2005-9 average, the number of people killed and seriously injured in collisions involving LGVs in London was 2 per cent higher in 2012. The number of slight casualties in collisions involving LGVs was 18 per cent higher (Allen et al. 2014).

Figure 3.2: Casualties resulting from collisions involving LGVs in London by severity, 1990-2012



Source: calculated from data provided by TfL, 2014.

Table 3.1: Fatal and serious casualties resulting from collisions involving LGVs were in London, 2012 compared with 2005-2009 average and 2011

Casualty mode of Travel	Casualty numbers			Percentage change in 2012 over	
	2005-2009 average	2011	2012	2011	2005-2009 average
Pedestrians	70	82	74	-10%	6%
Pedal cyclists	40	58	74	28%	87%
Powered two-wheeler	63	67	64	-4%	2%
Car occupants	55	46	43	-7%	-22%
Taxi occupants	3	1	0	-100%	-100%
Bus or coach occupants	6	2	4	100%	-29%
Goods vehicle occupants	40	25	23	-8%	-43%
Other vehicle occupants	1	2	2	0%	67%
TOTAL	**277**	**283**	**284**	**0%**	**2%**

Source: Calculated from data provided by TfL, 2014.

HGVs were responsible for 4 per cent of total motorised vehicle kilometres on roads in London in 2012, and were involved in collisions that resulted in 3 per cent of total road traffic casualties, 3 per cent of killed and seriously injured casualties, and 13 per cent of total road traffic fatalities in London in 2012 (Allen et al. 2014).

The number of fatal and serious injuries in collisions involving HGVs in London per vehicle kilometre travelled was 40 per cent lower in 2012 than the 2005-2009 annual average. The number of slight casualties in collisions involving HGVs per vehicle kilometre travelled was 16 per cent lower (Allen et al. 2014).

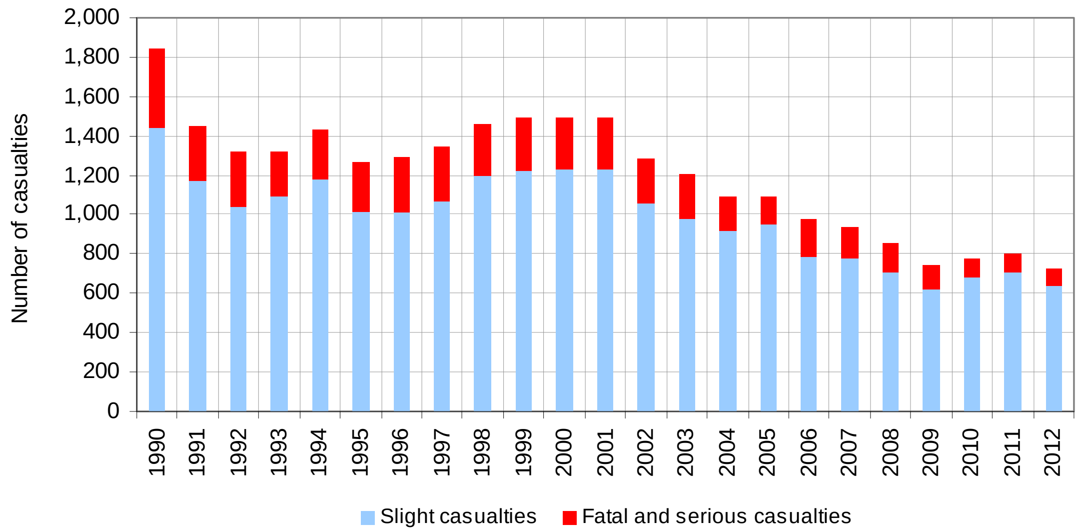
In 2012, 91 people were killed and seriously injured in collisions involving HGVs in London (compared to the 2005-9 average of 153 people). Of these, there were 18 fatalities in collisions involving HGVs in London in 2012 (compared with the 2005-9 average of 26 fatalities) (Allen et al. 2014).

Of the 18 fatalities resulting from collisions involving HGVs in 2012, 11 were pedestrians, 4 were pedal cyclists, 1 was a motorcyclist, 1 was a car occupant, and 1 was a goods vehicle occupant. Goods vehicles over 7.5 tonnes were involved in the majority of fatalities in collisions involving HGVs in 2012 (14 out of 18 fatalities) (Allen et al. 2014).

Research by TfL using 2010-2011 data indicated that HGVs serving the construction industry may be overrepresented in cyclist fatalities in London (Delmonte et al., 2012). This led to the formation of the Industrial HGV Task Force and other road safety-related work by TfL (Allen et al. 2014).

Compared with the 2005-9 average, the number of people killed and seriously injured in collisions involving HGVs was 40 per cent lower in 2012. The number of slight casualties in collisions involving HGVs was 17 per cent lower (Allen et al. 2014).

Figure 3.3: Casualties resulting from collisions involving HGVs in London by severity, 1990-2012



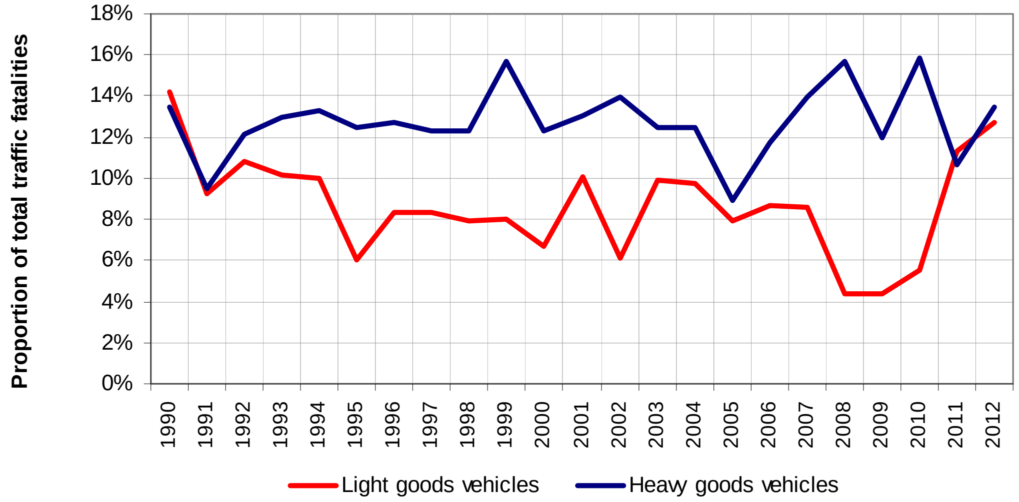
Source: calculated from data provided by TfL, 2014.

Table 3.2: Fatal and serious casualties resulting from collisions involving HGVs in London, 2012 compared with 2005-2009 average and 2011

Casualty mode of Travel	Casualty numbers			Percentage change in 2012 over	
	2005-2009 average	2011	2012	2011	2005-2009 average
Pedestrians	44	22	40	82%	-9%
Pedal cyclists	27	28	19	-32%	-30%
Powered two-wheeler	21	15	16	7%	-25%
Car occupants	40	22	12	-45%	-70%
Taxi occupants	2	3	0	0%	-100%
Bus or coach occupants	2	2	0	-100%	-100%
Goods vehicle occupants	15	5	4	-20%	-73%
Other vehicle occupants	1	1	0	-100%	-100%
TOTAL	**152**	**98**	**98**	**-7%**	**-40%**

Source: Calculated from data provided by TfL, 2014.

Figure 3.4: Proportion of total traffic fatalities resulting from collisions involving goods vehicles in London, 1990-2012



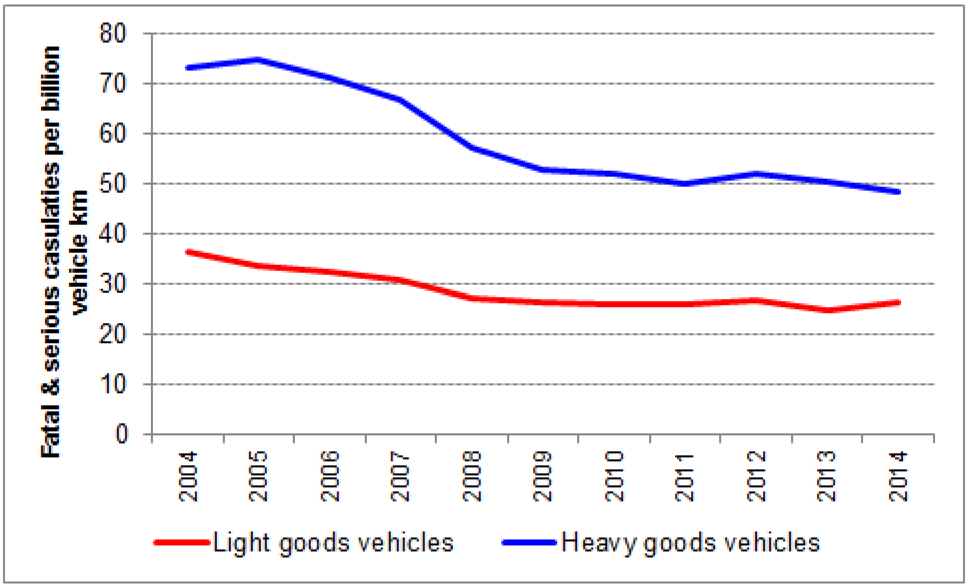
Source: Calculated from data provided by TfL, 2014.

3.2 Goods vehicle activity and casualties in Britain

Figures 3.5 to 3.7 provide comparable data to that provided for London in section 3.1 (except for a slightly different time period)**.**

This country-wide data shows a similar pattern of change over time to the London statistics, with falling rates of fatal and serious casualties per billion vehicle km for HGVs and LGVs between 2004-2009, since which times these rates have stabilised (see **Figure 3.5).**

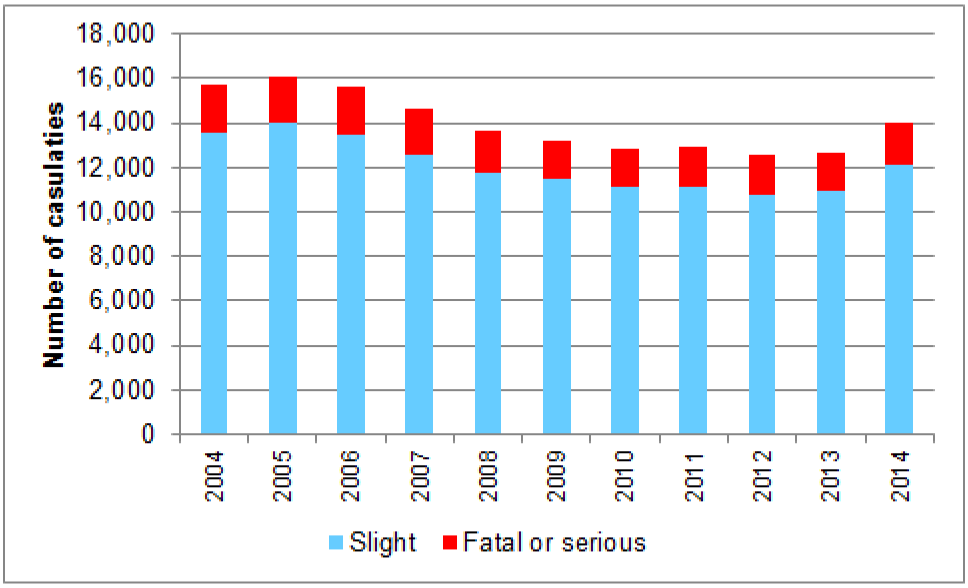
Figure 3.5: Fatal and serious casualties per billion vehicle kilometres in Britain, 2004-2014



Source: DfT, 2015e.

Casualty rates in collisions involving LGVs and HGVs in Britain also show a similar pattern to the London data **(see Figures 3.6 and 3.7).** Total casualties in collisions involving LGVs show a reduction between 2005 and 2008, since when they have remained stable **(see Figure 3.6).**

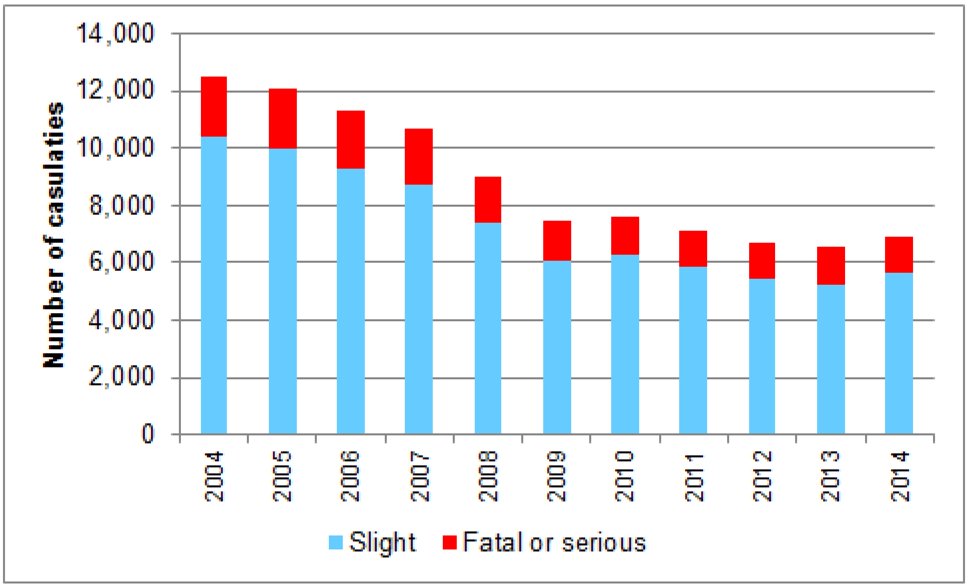
Figure 3.6: Casualties resulting from collisions involving LGVs in Britain by severity, 2004-2014



Source: DfT, 2015e.

Total casualties in collisions involving HGVs show a reduction between 2004 and 2009, since when they have remained stable **(see Figure 3.6).**

Figure 3.7: Casualties resulting from collisions involving HGVs in Britain by severity, 2004-2014



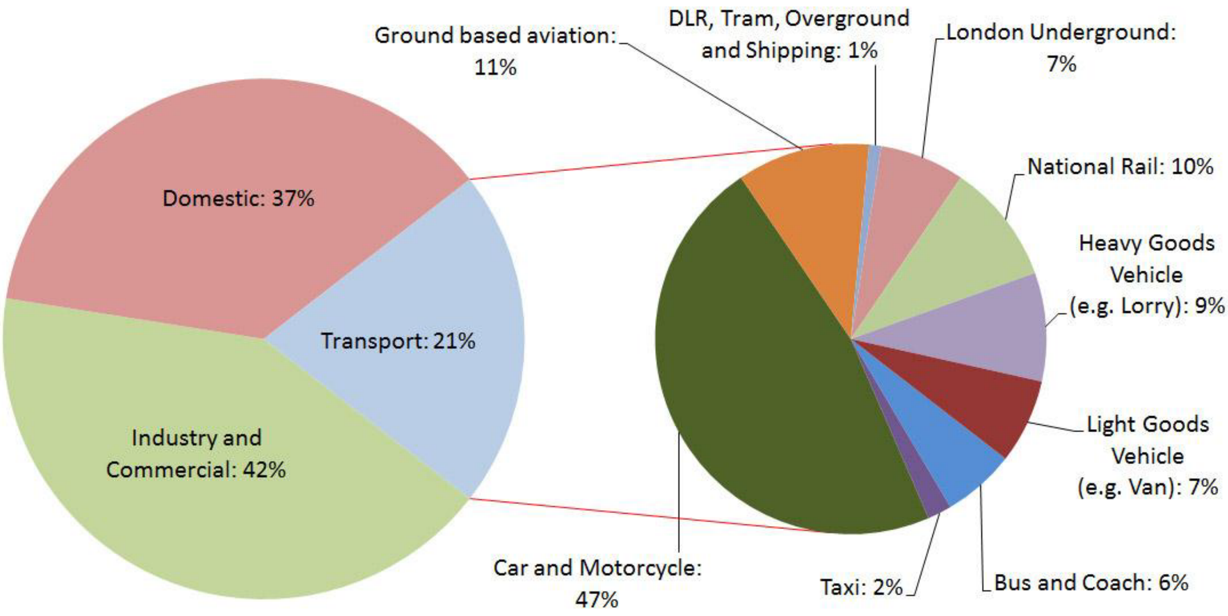
Source: DfT, 2015e.

4. GOODS VEHICLE ACTIVITY AND THE ENVIRONMENT IN LONDON AND BRITAIN

4.1 CO_2 emissions

Figure 4.1 shows TfL estimates of CO_2 emissions in London and the contribution of road transport, and road freight transport (i.e. HGVs and LGVs) to these CO_2 emissions. TfL has estimated that CO_2 emissions from road transport fell by 6 per cent between 2008 and 2010 (TfL, 2012).

Figure 4.1: CO_2 emissions in Greater London (produced from LAEI 2010)



Source: Mayor of London, 2014.

Total CO_2 emissions from road transport in London were estimated to be 6.8 million tonnes in 2010. These estimates indicate that road freight transport was responsible for 23 per cent of road transport CO_2 emissions in London in 2010 - 13 per cent by HGVs and 10 per cent by LGVs (while cars and motorcycles accounted for 65 per cent) (See **Table 4.1**).

Table 4.1: CO_2 emissions from road transport in Greater London by vehicle type

Type of road vehicle	Proportion of total
LGV	10%
HGV	13%
Cars and motorcycles	65%
Taxis	3%
Buses and coaches	8%
Total	**100%**

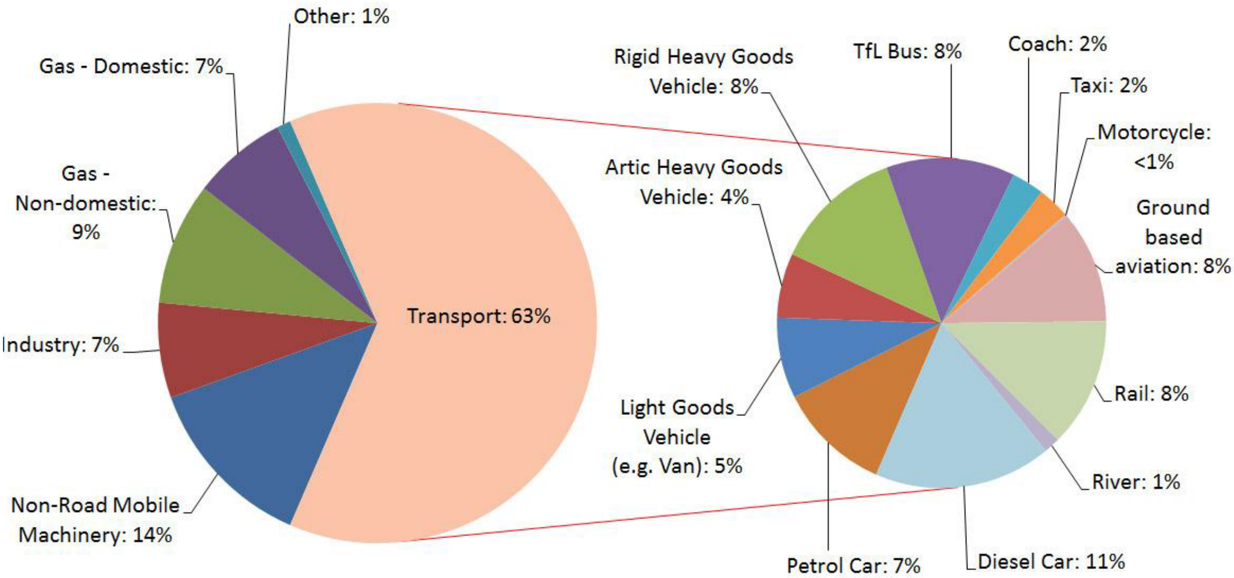
Source: estimated from TfL, 2012.

In Britain as a whole, LGVs and HGVs were estimated to account for 15% and 22% respectively of total road transport CO_2 emissions in 2013 (which were estimated to be 107 million tonnes) (DfT, 2015f).

4.2 NOx emissions

Figure 4.2 shows TfL estimates of NO_x emissions in London and the contribution of road transport, and road freight transport (i.e. HGVs and LGVs) to these NO_x emissions. TfL has estimated that NO_x emissions from road transport fell by 19 per cent between 2008 and 2010 (TfL, 2012).

Figure 4.2: NOx emissions in Greater London 2010 (produced from LAEI 2010)



Source: Mayor of London, 2014.

Total NO_x emissions from road transport in London were estimated to be 23,657 tonnes in 2010. These estimates indicate that road freight transport was responsible for 36 per cent of road transport NO_x emissions in London in 2010 - 24 per cent by HGVs and 12 per cent by LGVs (while cars and motorcycles accounted for 38 per cent) (see **Table 4.2**).

Table 4.2: NO_x emissions from road transport in Greater London by vehicle type

Type of road vehicle	Proportion of total
LGV	12%
HGV	24%
Cars and motorcycles	38%
Taxis	4%
Buses and coaches	22%
Total	**100%**

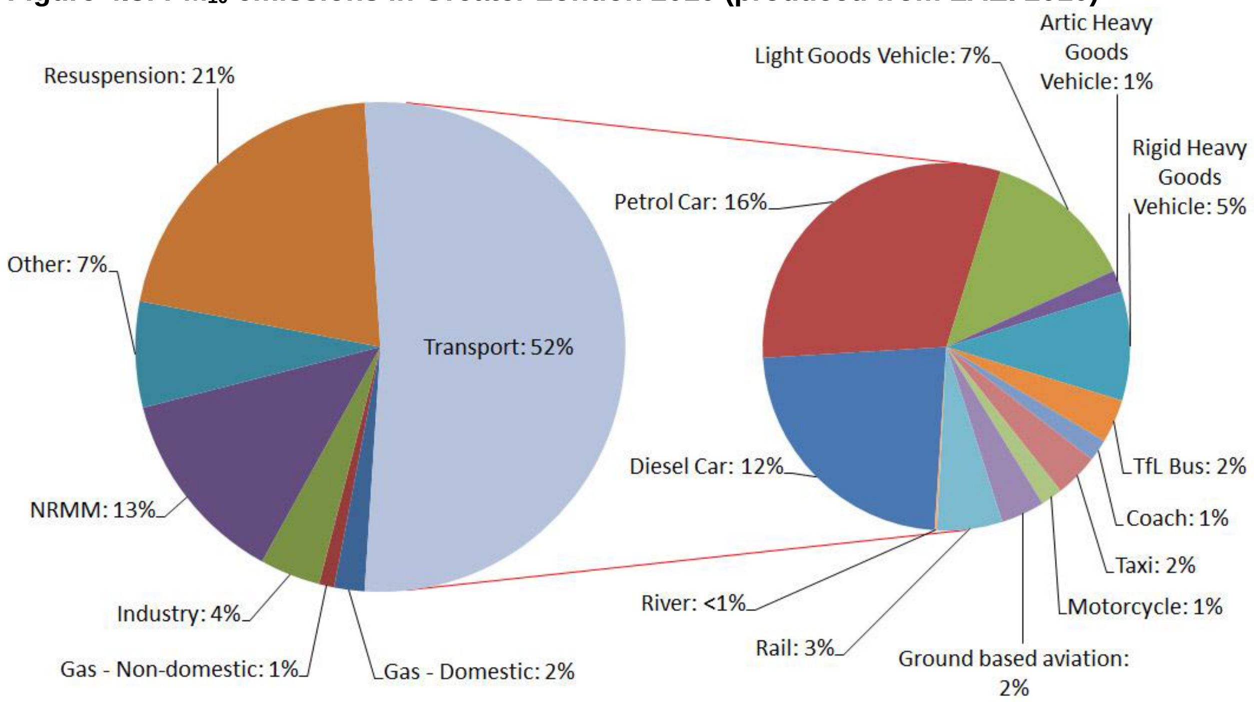
Source: estimated from TfL, 2012.

In Britain as a whole, LGVs and HGVs were estimated to account for 20% and 22% respectively of total road transport NO_x emissions in 2013 (which were estimated to be 323,000 tonnes) (DfT, 2015g).

4.3 PM_{10} emissions

Figure 4.3 shows TfL estimates of PM_{10} emissions in London and the contribution of road transport, and road freight transport (i.e. HGVs and LGVs) to these PM_{10} emissions. TfL has estimated that PM_{10} exhaust emissions from road transport reduced by 15 per cent between 2008 and 2010 (TfL, 2012).

Figure 4.3: PM_{10} emissions in Greater London 2010 (produced from LAEI 2010)



Source: Mayor of London, 2014.

Total PM_{10} exhaust emissions from road transport in London were estimated to be 597 tonnes in 2010. These estimates indicate that road freight transport was responsible for 39 per cent of road transport PM_{10} exhaust emissions in London in 2010 - 17 per cent by HGVs and 22 per cent by LGVs (while cars and motorcycles accounted for 47 per cent) (see **Table 4.3**).

Table 4.3: PM_{10} exhaust emissions from road transport in Greater London by vehicle type

Type of road vehicle	Proportion of total
LGV	22%
HGV	17%
Cars and motorcycles	47%
Taxis	8%
Buses and coaches	6%
Total	**100%**

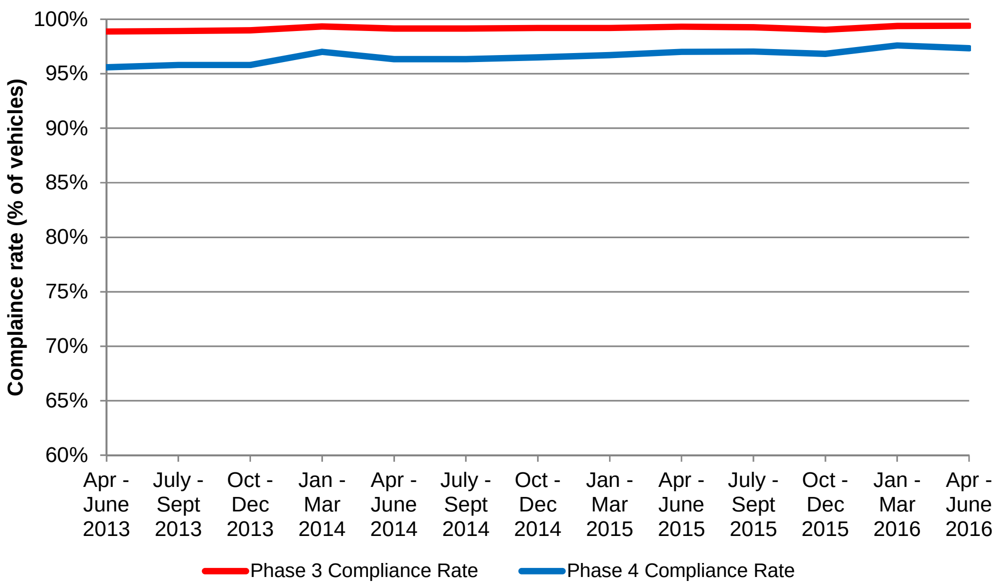
Source: estimated from TfL, 2012.

In Britain as a whole, LGVs and HGVs were estimated to account for 34% and 14% respectively of total road transport PM_{10} exhaust emissions in 2013 (which were estimated to be 8,000 tonnes) (DfT, 2015g).

4.4 London Low Emission Zone

In January 2012 Phases 3 and 4 of the London Low Emission Zone (LEZ) were introduced. Phase 3 requires Euro III standards for PM emissions for larger LGVs with an unladen weight of 1.205 tonnes or greater and minibuses entering Greater London, while Phase 4 requires Euro IV standards for PM emissions for HGVs, buses and coaches. Compliance rates at the end of June 2016 were 99.4% per cent for Phase 3 vehicles and 97.3% per cent for Phase 4 vehicles (see **Figure 4.4**). The LEZ scheme has therefore helped to achieve a shift in the 'Euro Class' of the HGV and larger LGV fleet operating London with the vast majority of older, dirtier goods vehicles eliminated, and thereby reduced NOx and PM_{10} emissions.

Figure 4.4: London Low Emission Zone (LEZ) Compliance rates, 2013-16



Source: TfL, 2016b.

5. HGV FREIGHT TRANSPORT ACTIVITY IN LONDON AND BRITAIN

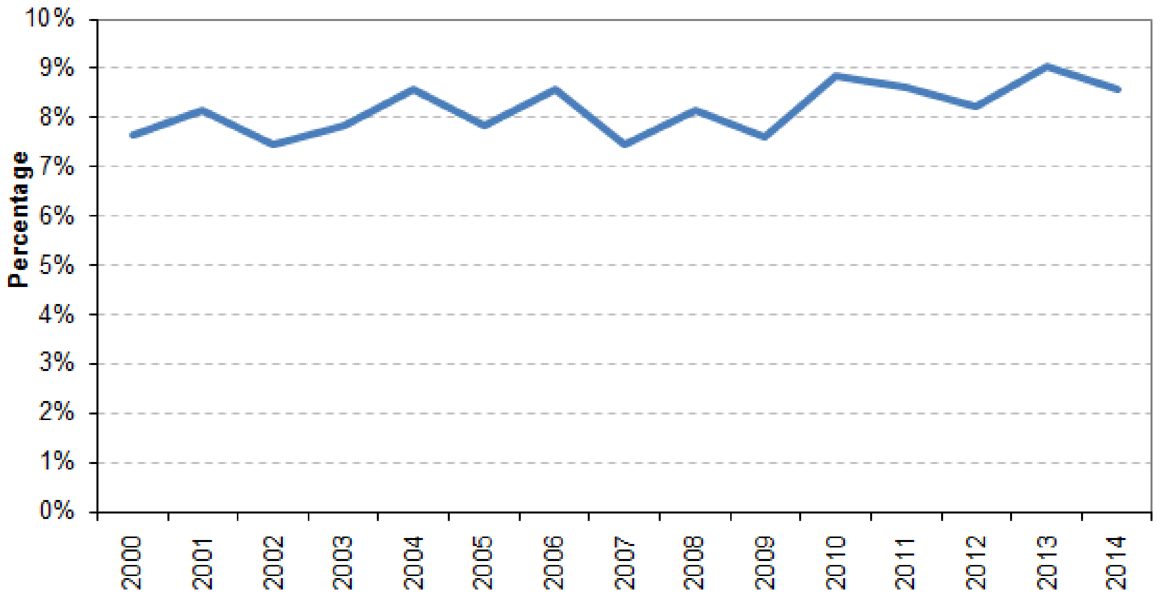
Approximately 485,000 HGVs were licensed in Britain in 2015, virtually all of which were diese-powered (DfT, 2016b). The number of HGVs licensed in Britain has changed relatively little since 2000, increasing by 2.5% (DfT, 2016c).

5.1 Total freight lifted by HGVs

Road is by far the dominant mode for goods transport in London in terms of the weight of goods lifted, with HGVs carrying approximately 95 per cent of all the freight to, from and within London (Allen et al., 2014). This does not take account of all the freight lifted by LGVs.
London is a net importer, meaning that more freight is unloaded in London than loaded by road, rail, water and air (Allen et al., 2014). By comparison, in Britain as a whole, road freight by HGVs accounted for 88% of all freight lifted by road, rail and water in 2014 (DfT, 2015c).

Approximately 128 million tonnes of road freight carried on journeys by UK-registered HGVs had its origin and/or destination in London in 2014 (DfT, 2016a). The road freight carried on journeys to, from and within London represented 8.6% by weight of the total freight lifted on all road freight journeys in Britain in 2014 (DfT, 2015c; DfT, 2016a). **Figure 5.1** shows the road freight lifted by HGVs in London as a proportion of the total freight lifted by HGVs in Britain. Since 2009 the freight lifted by HGVs in London has become relatively more important in terms of its contribution to total freight lifted by HGVs in Britain (accounting for approximately 8-9% from 2009-2014 compared with 7.5-8.5% from 200-2009).

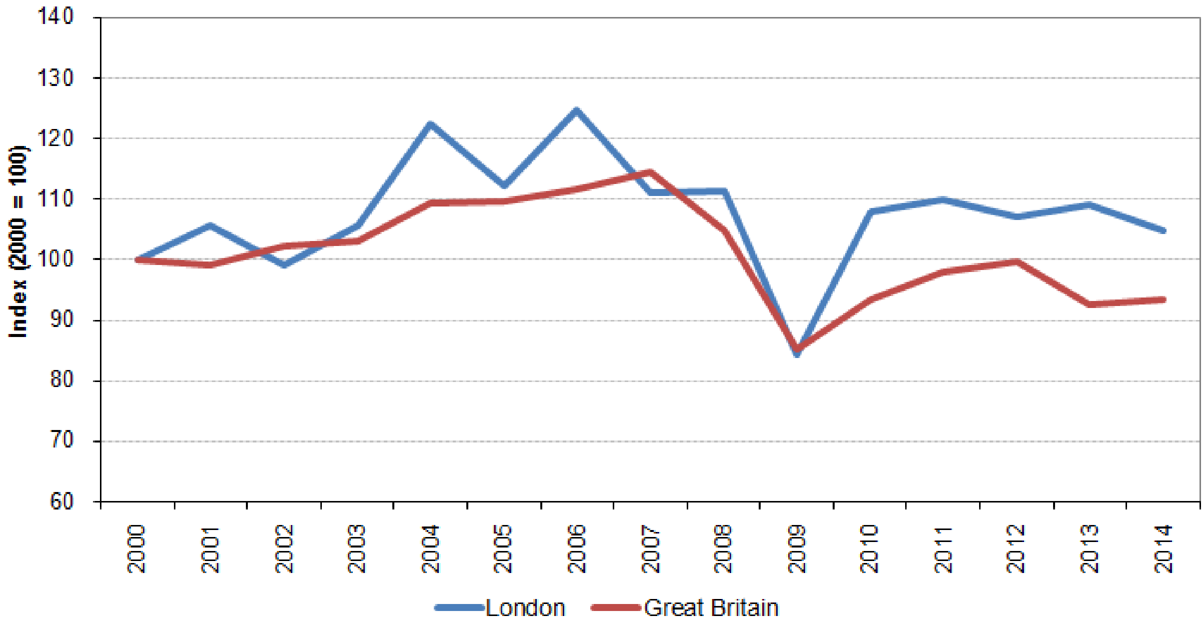
Figure 5.1: Freight lifted by HGVs in London as a proportion of freight lifted in Britain by HGVs, 2000-2014 (percentage)



Source: DfT, 2015c, DfT 2016a.

Figure 5.2 shows that in terms of freight lifted (in tonnes) by HGVs, the recovery in London since 2009 (i.e. following the recession) has outstripped that in Britain as a whole.

Figure 5.2: Freight lifted (tonnes) by HGVs in London and Britain, 2000-2014 (Index: 2000=100)



Source: DfT, 2015c; DfT, 2016a

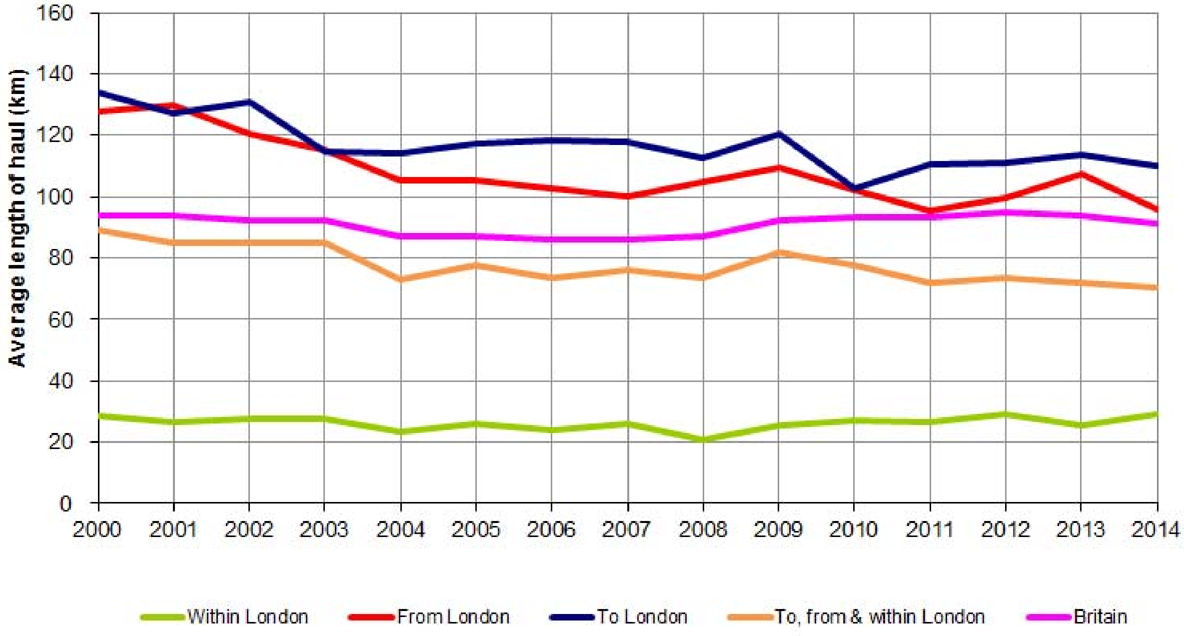
It is estimated that in 2014, 57 million tonnes lifted in London on journeys by UK-registered HGVs had both an origin and destination in London. Thirty eight million tonnes were lifted elsewhere in the country and had a destination in London, while 33 million tonnes were lifted in London and had a destination elsewhere in the country (DfT, 2016a).

Of the HGV freight lifted in London and delivered elsewhere in the UK in 2014, 73% by weight was unloaded in the two regions closest to London, namely the South East and the East of England. Of the freight delivered in London from elsewhere in the UK, 80% by weight was loaded in these same two regions (DfT, 2016a).

5.2 Freight activity by HGVs

The average length of haul for HGV movements to London was 29 km in 2014, compared with 96 km for journeys from London, and 110 km for journeys within London. The average length of haul for all HGV London-related journeys was 70 km in 2014 (DfT, 2016a). This compares with an average length of haul for HGVs in Britain of 91 km in 2014 (DfT, 2015d). **Figure 5.3** shows the average length of haul for HGV journeys associated with London and all HGV journeys in Britain since 2000.

Figure 5.3: Average length of haul on HGV journeys to, from and within London and Britain, 2000-2014



Source: DfT, 2016a; DfT, 2015d.

Rigid goods vehicles (over 3.5 tonnes gross weight) were responsible for 49% by weight of the freight lifted on all journeys within, to and from London, compared with 51% by articulated goods vehicles in 2014 (DfT, 2016a). This compares with the national picture in which rigid goods vehicles were responsible for 42% by weight of the freight lifted compared with 58% by articulated goods vehicles in 2014 (DfT, 2015h).

For all journeys within, to and from London in 2014, 31 per cent of vehicle kilometres were run empty (DfT, 2016a). This compares with an empty running percentage of 29 per cent for all HGV kilometres performed in Britain in 2014 (DfT, 2015h). The lading factor for all HGV journeys to, from and within London in 2014 was of 0.60, compared with a lading factor for all HGV activity performed in Britain of 0.62 (DfT, 2015i).

5.3 Transport intensity of HGV activity

A rise in the demand for goods (and goods transport) is likely to result in a less than proportional increase in goods vehicle activity (measured in vehicle kilometres). Similarly, a fall in the demand for goods is likely to results in a less than proportional decrease in goods vehicle activity. This is influenced by how freight transport operators cope with changes in goods flow, and their scope to increase the efficiency of goods vehicle operations through better loaded vehicle journeys and better planned vehicle routes and schedules.

Given that goods vehicles are not always operating at full capacity in terms of the quantity of goods carried and the time spent working by the vehicle/driver, it is possible for their lading factors in terms of load size/weight or working time (and hence their operational efficiency) to be increased as demand rises. Thereby, as the demand for goods (and goods transport) rises, it is possible for freight operators to deliver greater load quantities to each customer without the need to travel further.

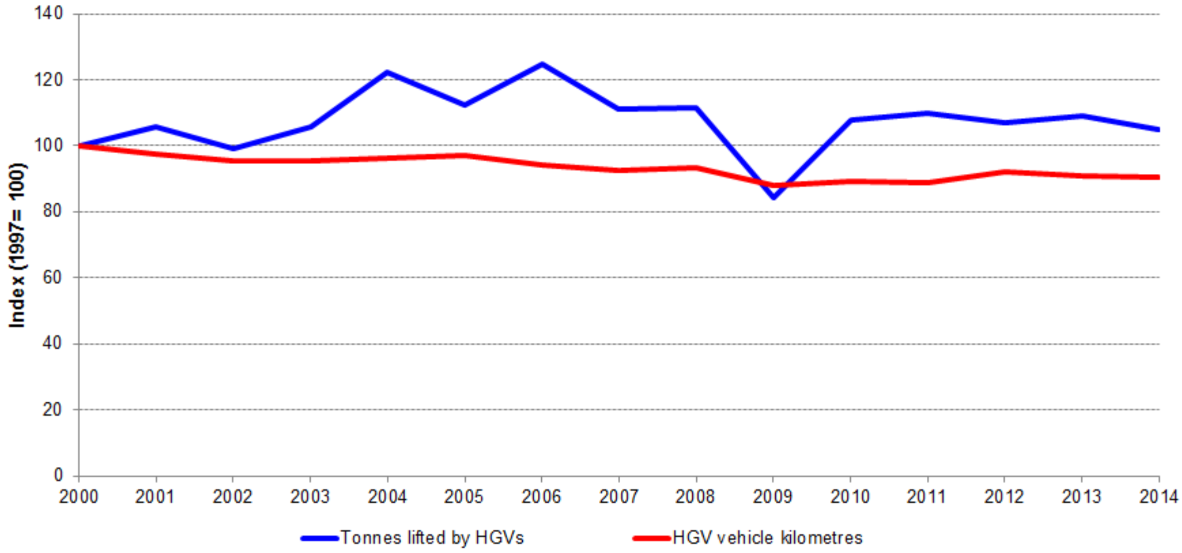
There is also scope for operators to reorganise their goods vehicle routeings and schedules as the demand for goods increases, in order to deliver more frequently to existing customers or to include new customers in the course of their work (especially in the case of multi-leg vehicle journeys). This can help operators to prevent increased vehicle journeys and the total distance travelled as demand increases. The larger the fleet size of the operator, the greater the scope they have to reschedule and reroute their vehicles in accordance with rising customer demand.

Obviously, as the demand for goods transport increases, vehicles eventually attain their maximum payload, or the maximum number of delivery locations they can serve per journey, and at that point additional vehicle journeys are required. However, until that point is reached, additional demand can be accommodated without increasing the number of journeys required. Therefore, increases in the demand for goods will result in less than proportional increases in goods vehicle journeys (and the total distance travelled by goods vehicles).

When freight demand falls it is also evident that operators may still have to continue with broadly the same pattern of operations (i.e. a customer may require a delivery whether it consists of 10 pallets or six pallets). As a result even when demand (in volume or tonnes) falls the vehicle kilometres performed may reduce more slowly (or in some cases not at all).

This relationship between the quantity of goods transported by goods vehicles, and the goods vehicle kilometres travelled by those vehicles is demonstrated by HGV data for London in **Figure 5.4**. **Figure 5.4** shows changes in the total goods lifted (measured in tonnes) by HGVs on journey to, from and within London, together with changes in the total vehicle kilometres performed by these vehicles on London's roads between 2000 and 2014. **Figure 5.4** shows that over this period HGV vehicle kilometres rose and fell by considerably less than the quantity of goods lifted.

Figure 5.4: Tonnes lifted and vehicle kilometres travelled by HGVs in London, 2000-2014 (Index 2000=100)

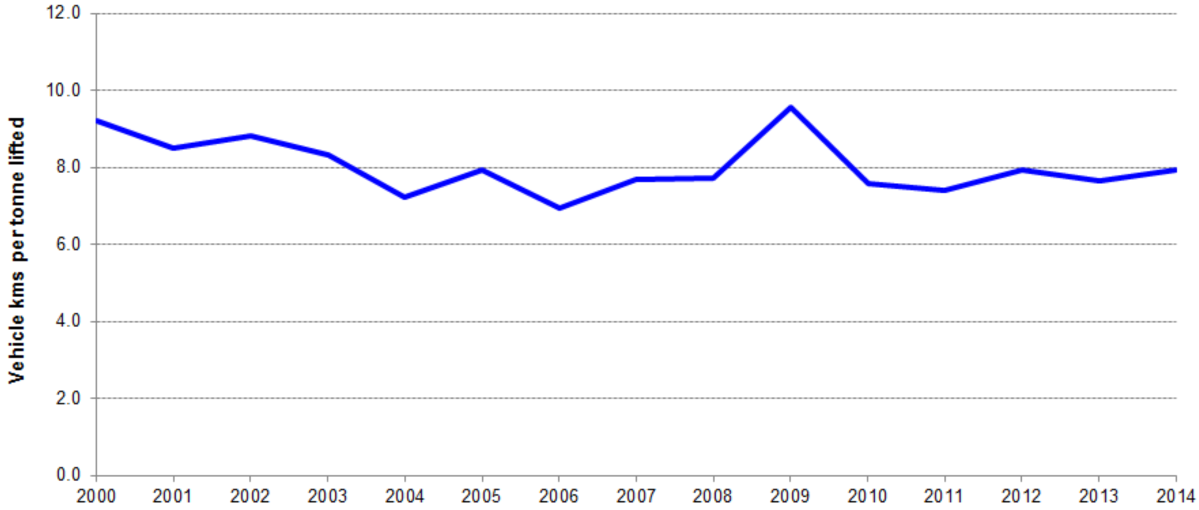


Source: DfT, 2016a.

The transport intensity of goods vehicle operations is reflected in the relationship between the quantity of goods lifted by HGVs and the total vehicle kilometres performed by these vehicles. The distance travelled per tonne lifted is determined by the length of haul, the vehicle carrying capacity, the vehicle lading factor, and the proportion of empty running. The greater the distance travelled per tonne lifted, the greater the intensity of road freight activity. This intensity level is closely related to the environmental sustainability of road freight as the distance travelled by HGVs has a major impact on fuel consumed, greenhouse gas emissions, local air pollutants, and accident levels.

Figure 5.5 shows the transport intensity of HGV operations on journeys to, from and within London since 2000. With the exception of the economic recession in 2009, the transport intensity of HGV operations associated with London has been between 7.5 and 8.0 vehicle kilometres per tonne lifted since 2004. This is lower than during the period 2000-2003 and indicates an improvement in HGV transport intensity in London.

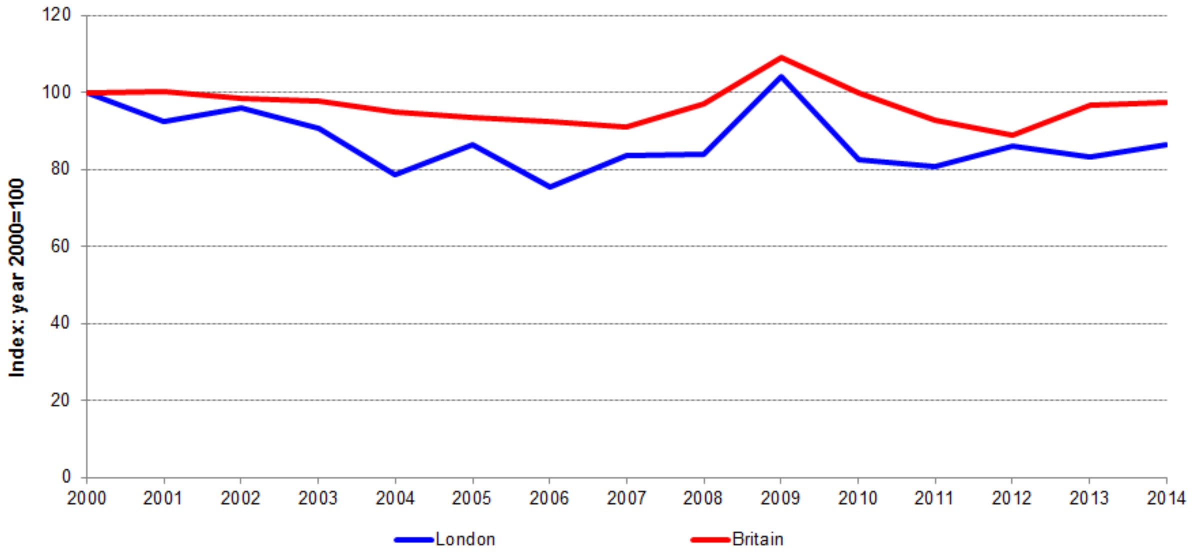
Figure 5.5: Transport intensity of HGVs journeys to, from and within London, 2000-2014 (vehicle kms per tonne lifted)



Source: DfT, 2016a.

Figure 5.6 shows changes in the comparative transport intensity of HGV operations on journeys to, from and within London and those in the whole of Britain since 2000 (the data has been indexed to the year 2000). This indicates that over the entire period the transport intensity of HGV operations to, from and within London has slightly outperformed those nationally.

Figure 5.6: Transport intensity of HGV operation in London and Britain, 2000-2014 (vehicle kms per tonne lifted, index year 2000 = 100)



Source: DfT, 2016a; DfT, 2015h; DfT, 2015j

5.4 Freight transport sectors by HGVs

5.4.1 Type of goods lifted on journeys to, from and in London

Using data about HGV operations to, from and within London disaggregated from the Department for Transport's (DfT's) Continuing Survey of Road Goods Transport (CSRGT) it is possible to obtain insight into the importance of different sectors in terms of the quantity of goods transported.

Table 5.1 shows the absolute and relative quantities of goods lifted by HGVs on journeys to, from and within London in terms of four commodity categories: "food, drink and tobacco products", "bulk products", "manufactured goods and chemicals", and "miscellaneous products".

"Food, drink and tobacco" comprises: products of agriculture, hunting, and forestry; fish and other fishing products; food products, beverages and tobacco.

"Bulk products" Wood and products of wood and cork (except furniture); straw products; pulp, paper and paper products; printed matter and recorded media; metal ores and other mining and quarrying products; peat; uranium and thorium ores; coal and lignite; crude petroleum and natural gas; other non-metallic mineral products.

"Manufactured goods and chemicals" comprises: textiles and textile products; leather and leather products; coke and refined petroleum products; chemicals, chemical products, and man-made fibres; rubber and plastic products; nuclear fuel; basic metals; fabricated metal products, except machinery and equipment; machinery and equipment not elsewhere specified; transport equipment; furniture; other manufactured goods not elsewhere specified.

"Other products" comprises: secondary raw materials; municipal wastes and other wastes; mail and parcels; equipment and material utilized in the transport of goods; goods moved in the course of household and office removals; luggage; vehicles moved for repair; other non-market goods not elsewhere specified; grouped goods: a mixture of types of goods which are transported together; unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to other groups; other goods not elsewhere specified.

Table 5.1 shows that in terms of all HGV journeys in London in 2014 “miscellaneous products” were most important in terms of the weight of goods lifted (accounting for 38 per cent), followed by “bulk products” (28 per cent) food and drink (25 per cent) and “manufactured goods and chemicals” (9 per cent) (DfT, 2016a).

Table 5.1: Commodities lifted by HGVs on journeys to, from and within London by type of journey, 2014 (million tonnes and proportion)

Commodity group	**Journey type**			
	Within London	**To London**	**From London**	**To, from and within London**
Food, drink and tobacco	9 (7%)	14 (11%)	10 (8%)	32 (25%)
Bulk products	20 (16%)	9 (7%)	6 (5%)	35 (28%)
Manufactured goods and chemicals	3 (2%)	5 (4%)	3 (2%)	11 (9%)
Other products	24 (19%)	10 (8%)	14 (11%)	48 (38%)
TOTAL	**57 (45%)**	**37 (30%)**	**32 (26%)**	**126 (100%)**

Source: calculated from data in DfT, 2016a.

More than half of all bulk products were lifted on HGV journeys within London, reflecting the low value and high bulk density of these products (DfT, 2016a). For some bulk commodities such as cement and other crude minerals, a far greater quantity is transported on roads within London than on road journeys to or from London due to the value density of the commodity as well as its availability within London.

The average length of haul for all HGV journeys to, from and within London in 2014 was 70 km. This varied depending on the type of commodity carried. For food and drink the average length of haul for journeys to, from and within London by HGV was 94 km, compared with 47 km for bulk products, 96 km for manufactured goods and chemicals, and 64 km for miscellaneous products (DfT, 2016a).

Mail and parcels (which are part of “miscellaneous products”) accounted for 3 per cent by weight of all freight lifted by HGVs on journeys, to, from and within London in 2014 (3.3 million tonnes). However, given that these movements are in HGVs, it is likely that these journeys are mostly associated with transfers of products between hubs and depots, rather than final deliveries and collections to customers (most of which take place using LGVs) (DfT, 2016a).

5.4.2 Type of goods lifted in Britain

Table 5.2 shows the absolute and relative quantities of goods lifted by HGVs in Britain. in terms of six commodity categories: “products of agriculture, forestry, raw materials”; “food products” (including beverages and tobacco); “textile, leather and wood products”; “metal, mineral and chemical products”; “machinery and equipment, consumer durables”; and “other products” (including waste related products, mail, parcels, empty containers, pallets and other packaging, household and office removals, grouped goods and unidentifiable goods).

Table 5.2: Commodities lifted by HGVs in Britain in 2014 (million tonnes and proportion)

Commodity group	Tonnes lifted	Proportion of all goods lifted
Products of agriculture, forestry, raw materials	358	24%
Food products, inc. beverages and tobacco	259	17%
Textile, leather and wood products	64	4%
Metal, mineral and chemical products	284	19%
Machinery and equipment, consumer durables	65	4%
Other products	460	31%
TOTAL	**1,490**	**100%**

Source: DfT, 2015j.

Comparing the commodities of goods lifted by HGVs on journeys to, from and within London and Britain as a whole, it is possible to note the greater relative importance of food and drink products in London (25% compared with 17% in Britain).

Within “other products” mail and parcels accounted for 2% of all goods lifted in Britain in 2014 (a total of 27 million tonnes of mail and parcels were lifted). These journeys had an average length of haul of 140 km and approximately 80% of mail and parcels were transported in HGVs with a gross weight above 35 tonnes (DfT, 2015j). Therefore, as for these movements in London, it is likely that these journeys are mostly associated with transfers between hubs and depots, rather than final deliveries and collections to customers.

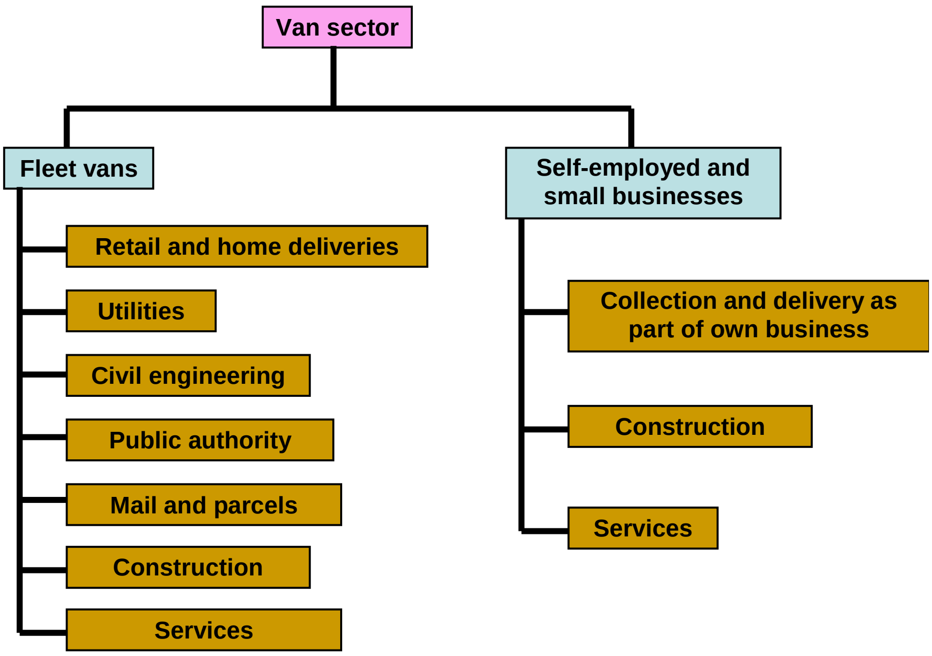
6. LGV FREIGHT TRANSPORT ACTIVITY IN BRITAIN

6.1 The various uses of LGVs

LGVs are used for a far wider range of journey purposes than HGVs (which are mostly only used to transport goods). The variety of journey types carried out by LGV include the collection and delivery of goods, the carrying out of servicing activities (and the related carriage of tools or equipment), commuting to and from a place of work (as many vans are kept at residential properties) and personal journeys (e.g. shopping and leisure journeys unconnected with work).

Figure 6.1 sub-divides the component parts of the LGV (van) sector in terms of the distinction between fleet vans and those operated by self-employed people and small businesses (CfIT, 2010). It is important to note the difference between LGV sales and operations. LGVs may be sold to a company considered by the vehicle manufacturer to be a fleet buyer (for example the rental and leasing companies). However, these vehicles may then be rented or leased to another company, small business or individual. In terms of sales by far the majority of sales of new vans are made to fleets (approximately 90 per cent). But it is important to recognise that the user of the LGV is not necessarily the owner (CfIT, 2010). In addition, whereas the vast majority of HGVs are owned by companies, in the case of LGVs, approximately 51% of all LGVs in Britain were registered to private individuals in 2015 (DfT, 2016d).

Figure 6.1: The LGV sector



Note: based on Round Tables and information from the CfIT Working Group.
Source: CfIT, 2010.

There were 3.6 million LGVs licensed in Britain in 2015. LGVs are seven times more numerous than HGVs (DfT, 2016b). In addition, the average size of LGV fleets operated by companies is far smaller than is the case for HGVs, with many operated by small companies and sole traders. Whereas the largest 1% of HGV fleets account for 28% of HGV vehicles, it has been estimated that the 200 largest UK van fleets account for only 9% of all LGVs (Sewells Research and Insight, 2014 quoted in FTA, 2016).

6.2 LGV fleet by sector

Very little research has been carried out into the extent to which LGVs serve different sectors of the economy (CfIT, 2010; AECOM, 2014). The notable exception is work carried out by the Freight Transport Association to attempt to estimate the number of LGVs operated in various sectors of the British economy using DfT data for LGV registrations in 2014 together with data from the ONS Annual Business (for company numbers by sector); the employment by occupation (EMP04) survey (which provides occupations and employment status of the UK workforce); benchmark figures provided by many major UK fleets; and member information from various trade and industry associations (FTA, 2016). The results are shown in **Table 6.1.**

Table 6.1: LGV fleet size estimates by sector in Britain in 2014

Sectors	Total number of LGVs	Proportion of total LGVs
Electricians	218,400	6.3%
Construction[1]	930,000	26.8%
Engineering (incl civil)	260,000	7.5%
Utilities (incl telecoms)	117,300	3.4%
TV audio engineers	15,000	0.4%
Retail (major chains)	30,000	0.9%
Retail (independent)	55,000	1.6%
Other skilled trades[2]	70,000	2.0%
Parcels, post and couriers[3]	297,000	8.6%
Agriculture and environment	100,000	2.9%
Gardening, groundskeeping, & landscaping	165,000	4.8%
Cleaning and salvage operations[4]	149,000	4.3%
Mobile catering	1,600	0.0%
Security and enforcement work incl police, prisons and fire	30,000	0.9%
Health care and social transport	23,500	0.7%
Vehicle repair and parts	60,000	1.7%
Road transport and distribution	50,000	1.4%
Other[5]	841,200	24.2%
Vehicles between keepers	58,200	1.7%
TOTAL	**3,471,200**	**100.0%**

Notes:
1. Includes specialist construction trades and finishing trades such as gas fitting, plumbing and plastering.
2. This includes florists, woodworkers, glass and pottery makers.
3. Includes the 205,000 who declare themselves as van drivers in EMP04, as these are mostly employed in this sector, rather than in road transport.
4. Total cleaning includes domestics and a female-heavy workforce. Only 149,000 vans are registered to women. The estimated fleet size excludes all but 10% of domestic cleaning but includes salvage, window cleaning and vehicle valets.
5. It has not been possible to identify all of the many self-employed activities which use vans, but they include minority occupations such as farriers, and professions which cross the line between hobbyist and professional such as dog breeding.

Source: FTA, 2016.

6.3 Freight activity by LGVs

No regular data is regularly collected by the Department for Transport about freight activity by LGVs in Britain (or London). It is therefore difficult to compare freight activity by HGVs and LGVs. No data has ever been collected about the proportion of LGVs used for different freight transport purposes in London, and the extent of this activity. However, some limited data is available at a national level.

In 2008 the DfT carried out a "Baseline Survey of Van Activity for England" (DfT, 2009a). The survey work was carried out in November and December 2008 and resulted in 8,959 usable responses, a response rate of 52%. The survey was intended to increase knowledge of LGV activities, vehicle specification and ownership type in England (see **Table 6.2**). The DfT Van Activity Baseline Survey results indicated that, on average, LGVs licensed to businesses and hire or lease companies travelled far greater distances per annum than those licensed to private individuals.

Table 6.2: Percentage share of LGV fleet and LGV distance travelled by ownership status in England, 2008

Type of ownership	Share of total LGV fleet	Share of total distance travelled	Annual distance travelled per vehicle (kms)
Private[a]	28%	16%	14,300
Business[b]	61%	67%	26,400
Hire or lease[c]	10%	16%	36,000
Not stated	1%	0%	22,200
All LGVs	**100%**	**100%**	**24,000**

Notes:
a: defined as private individual
b: defined as sole trader, partnership or limited company
c: defined as hire and/or leasing companies

Source: Calculated from data provided in DfT, 2009a.

Table 6.3 shows the relative importance in terms of vehicle kilometres travelled for various types of journey made by company-owned and privately-owned LGVs in Britain using data from the DfT Company Van Survey 2003-5 and the DfT Survey of Privately-Owned Vans in 2002/2003 (DfT, 2004; DfT, 2007). The results indicate that in the case of company-owned LGVs, goods collection and delivery, servicing, and commuting journeys each accounted for a similar proportion of vehicle kilometres (34%, 30% and 32% respectively). Personal trips accounted for only 4% of vehicle kilometres.

By comparison, for privately-owned LGVs commuting accounted for the greatest proportion of vehicle kilometres (45%), followed by goods collection and delivery (23%). Servicing journeys accounted for 15% of vehicle kilometres, while personal trips accounted for 17% of vehicle kilometres (far greater than for company-owned LGVs).

When the data for company-owned and privately-owned LGVs was combined, the most important journey purposes in terms of total vehicle kilometres travelled were in order of importance: commuting, goods collection and delivery, and servicing (accounting for 36%, 30% and 25% respectively). Personal journeys accounted for 8% of total van vehicle kilometres.

Table 6.3: LGV vehicle kilometres accounted for by journey purpose and vehicle ownership in Britain, 2002/3-2005

Journey purpose	Company-owned LGVs	Privately-owned LGVs	All LGVs
Servicing activity	30%	15%	25%
Commuting	32%	45%	36%
Goods collection and delivery	34%	23%	30%
Personal (shopping and other)	4%	17%	8%
Total	**100%**	**100%**	**100%**

Notes:
Company-owned LGV data is average for 2003-2005. Privately-owned LGV data is for October 2002-September 2003.
Source: calculated from data provided in DfT, 2004 and DfT, 2007.

The DfT Van Activity Baseline Survey also gathered data about vehicle kilometres travelled by journey purpose and vehicle ownership in England (see **Table 6.4**). This survey made use of different journey type options to the Company Van and Privately-Owned Van Surveys and asked respondents to identify the primary type of journey made by the LGV (rather than analysing the journey purpose of each journey made) and therefore the results are not directly comparable with those shown in **Table 6.3**.

Table 6.4: LGV vehicle kilometres accounted for by journey purpose and vehicle ownership in England in 2008 (% of all van vehicle kilometres)

	Ownership of LGV			
Journey purpose	**Business**	**Hire or Lease**	**Private**	**All vans**
Delivery / collection of goods	32%	32%	13%	29%
Carriage of equipment	62%	61%	40%	58%
Providing transport to others	4%	3%	1%	3%
Private and domestic	2%	2%	46%	10%
Total	**100%**	**100%**	**100%**	**100%**

Notes:
Excludes reported kilometres for which no journey purpose was stated.
Source: calculated from data provided in DfT, 2009a.

Table 6.4 provides further useful insight into LGV journey purposes. The survey results indicate that the “carriage of equipment” (i.e. servicing activities) accounted for 58% of the total distance travelled by all LGVs amounting to twice the total distance travelled by LGVs when used primarily for the delivery/collection of goods (29%). Ten per cent of the total distance travelled by all LGVs was for private and domestic purposes.

6.4 Changes in size and weight of LGVs operated

LGVs are manufactured in many sizes and weights (up to 3.5 tonnes gross weight). SMMT data shows that between 1990 and 2015 there has been a significant shift in the weight of LGVs licensed in Britain (see **Table 6.5**). "Car derived/microvans" (up to 2 tonnes gross weight) and "medium vans" (2.0-2.5 tonnes gross weight) have both fallen substantially, from a combined total of 68% of the total LGV fleet in Britain in 1990 to only 34% in 2015. By contrast, "heavy vans" (2.5 – 3.5 tonnes gross weight) licensed in Britain have risen from 23% of the total LGV fleet in Britain in 1990 to 54% in 2015. Meanwhile, the proportion of 4x4 utility vehicles and pick-ups has remained relatively stable as a proportion of the total LGV fleet in Britain over the entire period (SMMT, 2016).

Table 6.5: Proportion of types/weights of LGV in the Britain fleet, 1990-2015

Van type	1990	1995	2000	2005	2010	2015
4x4 Utilities & Pickups	9%	10%	10%	11%	11%	12%
Car-derived/Micro vans (up to 2.0 tonnes gvw)	37%	36%	34%	27%	22%	18%
Medium vans (2.0-2.5 tonnes gvw)	31%	27%	21%	17%	16%	16%
Heavy vans (2.5 -3.5 tonnes gvw)	23%	27%	34%	45%	51%	54%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note:
"gvw" - gross vehicle weight.
Source: SMMT, 2016.

In addition to there being a growing proportion of heavier, more powerful LGVs in use, there is also a trend towards the production and use of longer LGVs which have a greater load space making them more useful when operated as a substitute for a small HGV (CfIT, 2010). A growing proportion of the medium and heavy LGVs are being produced with long wheel bases (the wheel base is the distance between the front and rear wheels). The longer the wheel base, the bigger the load space in the vehicle. LGVs with long wheel bases have approximately an additional 20 per cent load space for every extra ½ metre of length compared with shorter LGVs, with little or no difference in gross weight (McKinnon et al., 2015).

An analysis of data from the Low Emission Zone ANPR-camera network in London shows that it is predominantly heavier, larger LGVs that are being used in London, with approximately 60% of LGVs entering London having an unladen weight of more than 1.76 tonnes, about 20% having an unladen weight of 1.305-1.76 tonnes and a further 20% having an unladen weight of below 1.305 tonnes (AECOM, 2013).

6.5 Propulsion / fuel type of the LGV fleet

In 2015, 3.6 million LGVs were licensed in Britain (DfT, 2016b). **Table 6.6** shows the categorisation of these vehicles by propulsion / fuel type. **Table 6.6** shows that the overwhelming majority of LGVs in Britain were diesel-powered in 2015 (95.9%).

Up until the 1990s the majority of LGVs in Britain were powered by petrol. However, diesel engines have become increasingly popular among LGV operators as a result of their superior fuel economy performance, robust design and ongoing improvements in engine technology (e.g. turbo charging) (Momenta, 2006). In 1986, only 16% of all vans licensed in Britain were diesel-powered but this rose to 69% by 1998, 93% by 2008 and 96% by 2015 (DfT, 1986; DfT, 2009b; DfT, 2015e). Although diesel engines produce fewer CO_2 emissions than petrol engines per unit of distance travelled, they do emit more NOx, SO2 and particulates per unit distance than petrol. By contrast, the use of petrol has become increasingly less important, with a falling pattern of petrol-powered LGVs over the last two decades (with 133,400 in 2015) (see **Table 6.6).**

Table 6.6: LGVs licensed in Britain by propulsion / fuel type in 2015

Propulsion / fuel type	Thousands and percentage
Diesel	3,486.3 (95.9%)
Petrol	133.4 (3.7%)
Gas[1]	8.7 (0.2%)
Electric	4.5 (0.1%)
Other[2]	0.7 (0.0%)
Total	**3633.6 (100%)**

Notes:
1. Includes gas, gas bi-fuel, petrol/gas and gas-diesel.
2. Includes new fuel technologies, fuel cells and steam.
Source: DfT, 2016e.

By comparison, very few LGVs in Britain are powered by alternative fuel sources. In 2015, only 8,700 LGVs were powered by gas, only 4,500 were powered by electricity, and only 700 were powered by other fuel technologies including fuel cells (DfT, 2016e).

6.6 Growth in the use of LGVs

The quantity of freight activity by LGVs has been growing over the last two decades. This is borne out by the 48% increase in the number of LGVs licensed in Britain between 2000 and 2015, as well as the 47% increase in vehicle kilometres that LGVs travelled annually over this same period (DfT, 2015a; DfT, 2016f). LGV traffic growth has been more rapid nationally and in London than for any other vehicle type (see **Figures 2.8 and 2.9**).

As previously mentioned (see **section 2.3**), several factors have been identified as contributing to this growth in the use of LGVs in Britain trend in the different. These include (CfIT, 2010):

- Growth in smaller, more frequent collections and deliveries to companies (just-in-time distribution)
- Growth in online shopping and home delivery operations
- Growth in demand for express and parcels services
- Outsourcing of service functions to specialist companies
- Development and use of more technological and communications equipment that requires installation, planned servicing and emergency repairs
- The installation and maintenance of new telecommunication networks
- Increase in rapid response servicing (e.g. computer repairs etc.)

- Growth in the UK construction industry
- Increasing home renovations and improvements in the UK
- Growth in population and number of households
- Economic growth, employment and formation rate of new small businesses
- The less stringent regulatory regime for LGVs compared with HGVs
- The shortage of HGVs driver compared to LGV drivers

Due to lack of appropriate data, it is not possible to quantify the relative importance of each of these factors on increases in LGV activity in London and Britain.

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