



London Freight Data Report: 2012 Update

Prepared by

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For

Transport for London

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Revised final version

Introduction

The London¹ Freight Data Report is an annual summary of freight transport statistics in London. This report has been prepared by Julian Allen, Michael Browne and Allan Woodburn in the Transport Studies Department at the University of Westminster for Transport for London (TfL).

The report contains data from a wide range of sources both in TfL and other organisations. We would like to thank all these organisations for their help and assistance. Data sources and acknowledgements can be found at the end of the report.

London freight and logistics industry

- The success of London is dependent on the efficient movement of goods and services as well as people. The growth of London in the medium- to long-term, as set out in the London Plan, will lead to an increase in freight movement to construct, supply and service London's economy in a sustainable way.
- Despite the current economic conditions, the Mayor's London Plan (published in 2011) forecasts that approximately one million more people and 690,000 more jobs will have to be accommodated in London by 2031. This will result in additional passenger and freight transport demand.
- Goods vehicles accounted for 17 per cent of all vehicle kilometres travelled on London's roads in 2010 and are second only in scale to cars.
- TfL has put in place several projects to improve the efficiency, safety and environmental impacts of road freight transport across London including the Freight Operator Recognition Scheme (FORS), Distribution and Servicing Plans (DSPs), Construction Logistics Plans (CLPs), and the Low Emission Zone. The London Freight Plan (2007) explains these steps being taken in more detail.
- Logistics is a major source of employment with approximately 1.5 million people directly employed in logistics companies in the UK in 2010. This is equivalent to 5 per cent of the UK workforce. These employees operate from approximately 190,000 workplaces (about 7 per cent of the total workplaces in the UK).
- In 2010, approximately 215,000 (5 per cent of the London workforce) were directly employed in organisations whose main activity involves freight transport and logistics (this does not include self-employment). Wholesaling is the logistics sub-sector with the greatest number of employees in London - 135,000 people in 2010.
- There were estimated to be approximately 30,000 transport and logistics workplaces in London in 2011. About 70 per cent of these workplaces were involved in wholesaling activities.
- Workplaces employing 10 or fewer people accounted for approximately 85 per cent of all transport and logistics workplaces in London in 2011, while those employing over 100 people account for only 2 per cent.
- The total number of warehouses in London fell by 16 per cent between 1998 and 2008. In the south east the total number of warehouses rose by 13 per cent over the same period, suggesting that some businesses may have been

¹ The use of the term 'London' in the report refers to Greater London (i.e. the whole of London comprising 33 London boroughs).

relocating their storage locations from London to the area surrounding London during this period as a result of land values and accessibility issues.

- The total warehousing floorspace in London in 2008 was 4 per cent higher than in 1998. This growth in total warehousing floorspace in London between 1998 and 2008 was substantially less than in all other Government regions in England and Wales.
- The total warehousing floorspace in London in 2008 was equal to 10 per cent of all warehousing floorspace in England and Wales.
- The average size of warehouses in London rose by 24 per cent between 1998 and 2008.

London freight transport activity

- Road is by far the dominant mode for goods transport in London in terms of the weight of goods lifted. The next most important mode is Port of London traffic on the river Thames within London, followed by rail and air.
- The weight of freight lifted by road and air was greater in 2010 than in 2009, while for water and rail it was slightly lower. This resulted in the relative importance of road and air freight transport increasing year-on-year.
- London is a net importer, meaning that more freight was unloaded in London than loaded by road, rail, water and air in 2010.

Table 1: Freight lifted by mode on journeys to, from and within London, 2010

	Million Tonnes	Per cent
Road	131.7	89.3%
Water (Thames inside London)	7.8	5.3%
Rail	6.4	4.3%
Air	1.6	1.1%

Notes:

Road - only goods vehicles over 3.5 tonnes gross weight (i.e. light goods vehicle activity not included). Water (Thames inside London) – does not include traffic handled by PLA wharves on the Thames outside London, or waterways in London other than the Thames. Air – only includes freight and mail handled at Heathrow Airport (other London Area Airports not included).

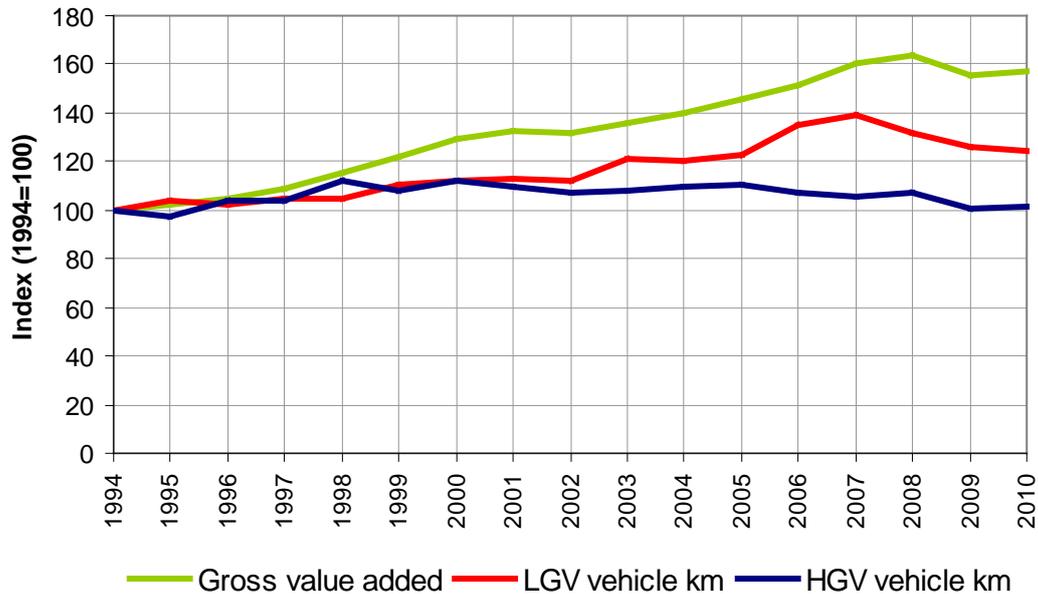
Sources: DfT, 2012; Network Rail, 2012, PLA, 2012; CAA, 2012

Freight transport by road

Road freight transport activity

- Growth in London's Gross Value Added (GVA) has outstripped growth in light goods vehicle (LGV) and heavy goods vehicle (HGV) traffic over the period since the mid-1990s (with GVA increasing by 36 per cent between 1994 and 2010, LGV traffic by 20 per cent and HGV traffic by 2 per cent). This suggests that London's economy has become less road freight intensive over this period.

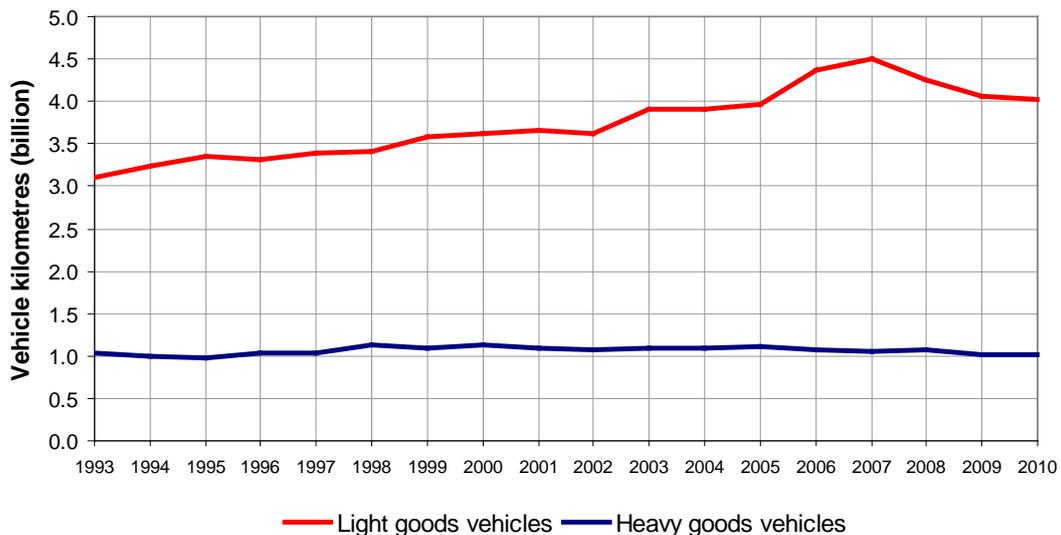
Figure 1: Comparison of Gross Value Added and goods vehicles kilometres travelled in London, 1993-2010



Source: Calculated from data provided by DfT, 2012 and TfL, 2012

- LGV traffic in London fell by approximately 1 per cent between 2009 and 2010, while GVA and HGV traffic rose by 1 per cent.
- LGV traffic on London's road rose sharply between the 1990s and 2007, but has fallen back somewhat since. LGV traffic was 33 per cent higher in 2007 compared with the 1994-1999 average, while HGV traffic was only 2 per cent higher. However, LGV traffic on London's roads was 11 per cent lower in 2010 than it had been in 2007, while HGV traffic was 4 per cent lower. By comparison car traffic was 1 per cent lower in 2007 compared with the 1994-1999 average, and was 2 per cent lower in 2010 than it had been in 2007.

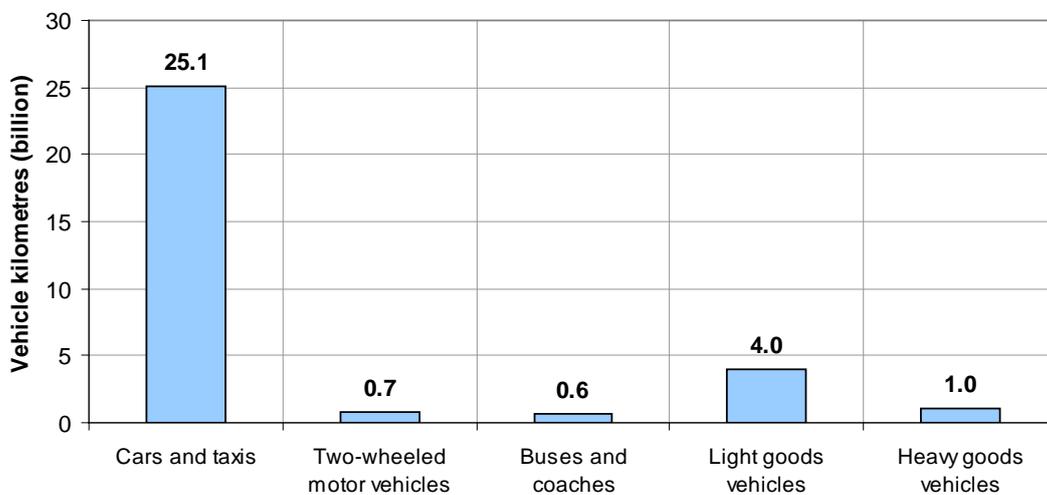
Figure 2: Vehicle kilometres performed by goods vehicles on all roads in London, 1993-2010



Source: TfL, 2012

- All goods vehicles (i.e. LGVs and HGVs) travelled a total of 5.0 billion vehicle kilometres on roads in London in 2010. Eighty per cent of these kilometres were performed by LGVs (up to 3.5 tonnes gross weight), 15 per cent by rigid goods vehicles over 3.5 tonnes, and 5 per cent by articulated goods vehicles over 3.5 tonnes.
- LGVs and HGVs were responsible for 13 per cent and 3 per cent respectively of the vehicle kilometres travelled by all motorised road vehicles in London in 2010. This data is based on vehicle movements; if it were based on equivalent Passenger Car Units (PCUs) then HGVs would approximately double in importance.²
- LGVs are estimated to have performed 57 per cent of their total distance travelled in London in 2010 on major roads and 43 per cent on minor roads, compared with 85 per cent and 15 per cent respectively for HGVs.

Figure 3: Total vehicle kilometres travelled in London by vehicle type, 2010



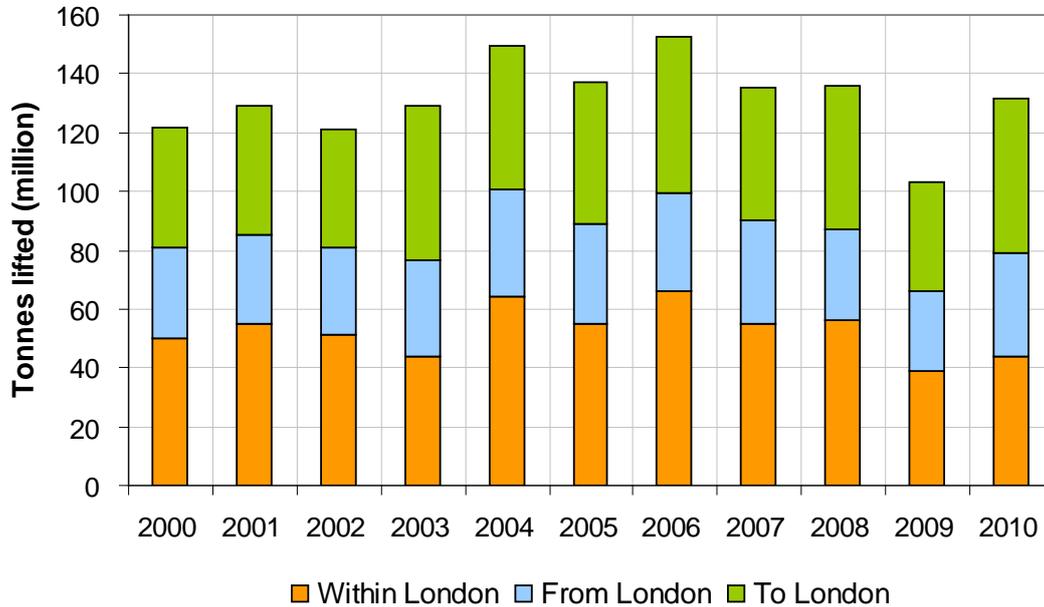
Source: TfL, 2012

- Approximately 132 million tonnes of road freight carried on journeys by UK-registered HGVs had its origin and/or destination in London in 2010. The road freight carried on journeys to, from and within London represented approximately 9 per cent by weight of the total freight lifted on all road freight journeys in Britain in 2010.
- It is estimated that in 2010, 44 million tonnes lifted in London on journeys by UK-registered HGVs had both an origin and destination in London. Fifty three million tonnes were lifted elsewhere in the country and had a destination in London, while 35 million tonnes were lifted in London and had a destination elsewhere in the country.
- London has a higher net inflow of goods by road than all other British regions in 2010, with 18 million more tonnes of goods arriving on vehicle journeys than leaving.
- Of the freight lifted in London and delivered elsewhere in the UK in 2010, 79 per cent 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

² The Department for Transport uses Passenger Car Unit (PCU) factors of 1.9 for rigid HGVs and 2.9 for articulated HGVs (DfT, 2009). Given that rigid and articulated HGVs accounted for 77 and 23 per cent respectively of total HGV vehicle kilometres in London in 2010, all HGVs can be calculated to have a PCU factor of 2.1. DfT uses a PCU factor of 1.0 for LGVs.

London from elsewhere in the UK, 76 per cent by weight was loaded in these same two regions.

Figure 4: Freight lifted by HGVs on journeys to, from and within London, 2000-2010



Source: DfT, 2012

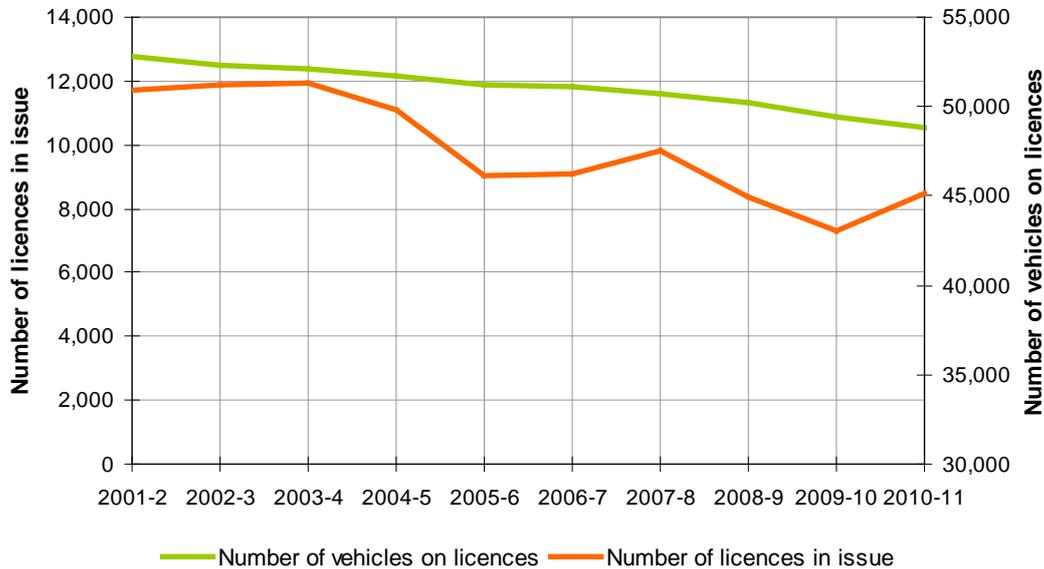
- Rigid goods vehicles (over 3.5 tonnes gross weight) were responsible for 49 per cent by weight of the freight lifted on all journeys within, to and from London, compared with 51 per cent by articulated goods vehicles in 2010.
- For all journeys within, to and from London in 2010, 31 per cent of vehicle kilometres were run empty. This compares with an empty running percentage of 29 per cent for all HGV kilometres performed in Britain in 2010.
- The lading factor of 0.59 for all HGV journeys to, from and within London in 2010 is the same as the lading factor for all HGV activity performed in Britain.

Goods vehicles licensed in London

- There were approximately 230,000 goods vehicles licensed with keeper's addresses in London at the end of September 2011. The vast majority of these were LGVs (i.e. up to 3.5 tonnes gross vehicle weight). This is approximately 2 per cent fewer goods vehicles than were registered at keeper's addresses in London a year earlier, and 5 per cent fewer than 2 years earlier. However, it should be noted that the fact that a vehicle is registered at a London address does not necessarily mean that the vehicle is kept and used in London. Similarly, vehicles registered at addresses outside London may be kept and used in London.
- In the whole of the South East and Metropolitan Traffic Area (SEMTA - which includes London), 10,367 operator licences were in issue in 2010/11 for a total of 43,488 HGVs. This is equivalent to approximately 12 per cent of all HGVs specified on operator licences in Britain.
- The number of operator licences in SEMTA has fallen by 17 per cent between 2001/02 and 2010/11, while the number of HGVs on these licences has fallen by 11 per cent. This compares with a 16 per cent reduction in operator

licences and 11 per cent reduction in the number of HGVs on these licences in Britain as a whole over the same period.

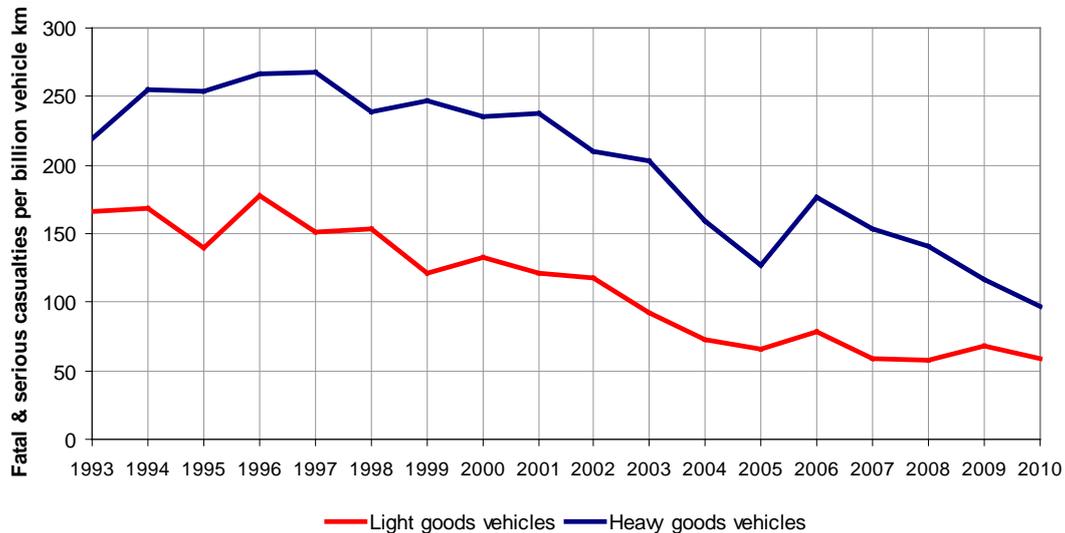
Figure 5: Operator licences in issue and HGVs specified on these licences in SEMTA, 2001/02-2010/11



Source: Traffic Commissioners

Road freight transport and society

Figure 6: Fatal and serious casualties per billion vehicle kilometres in London, 1993-2010

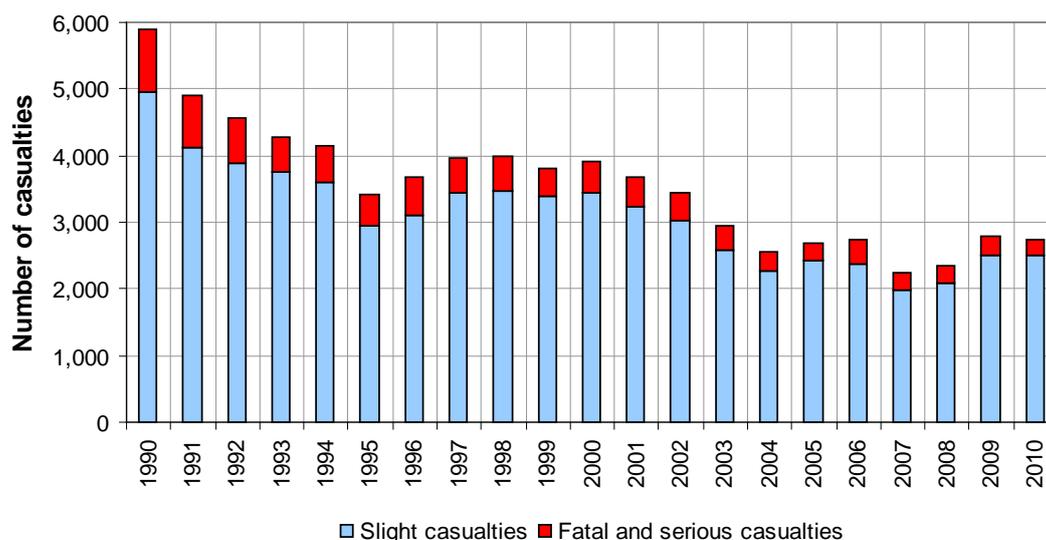


Source: calculated from data provided by TfL, 2012

- LGVs were responsible for 13 per cent of total motorised vehicle kilometres on roads in London in 2010, and were involved in collisions that resulted in 10 per cent of total road traffic casualties. These collisions resulted in 6 per cent of total road traffic fatalities in London in 2010.
- In 2010, 236 people were killed and seriously injured in collisions involving LGVs in London.

- The number of fatalities in collisions involving LGVs has fallen each year between 2006 and 2010, with 13 fewer fatalities in 2010 than in 2006.
- The number of people killed and seriously injured in collisions involving LGVs was 55 per cent lower in 2010 than the 1994-1998 annual average. The number of slight casualties in collisions involving LGVs was 24 per cent lower over the same period.
- The number of fatal and serious injuries in collisions involving LGVs in London per vehicle kilometre travelled was 63 per cent lower in 2010 than the 1994-1998 annual average.

Figure 7: Casualties resulting from collisions involving LGVs in London by severity, 1990-2010



Source: calculated from data provided by TfL, 2012

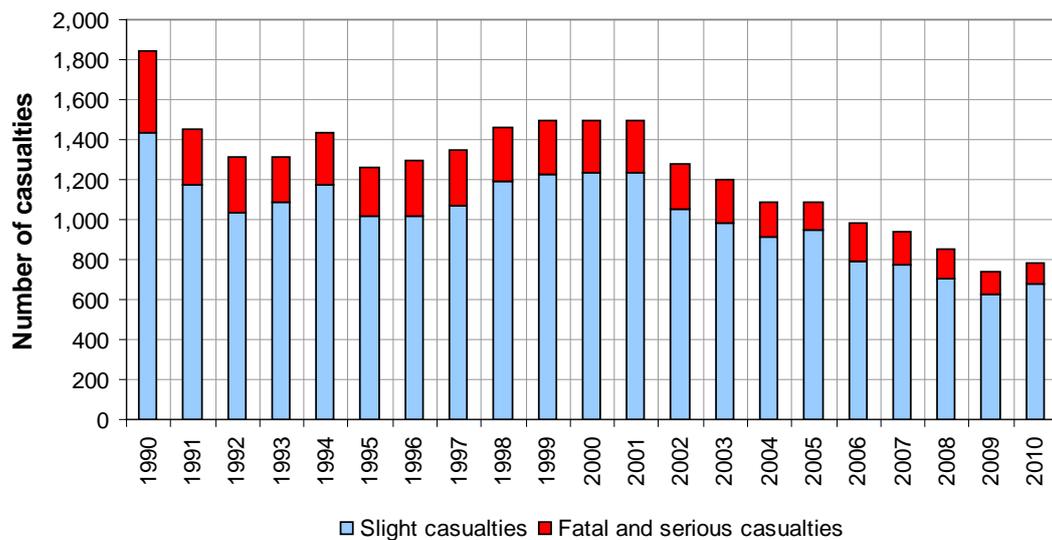
Table 2: Fatal and serious casualties resulting from collisions in which LGVs were involved in London by mode of travel, 2010 compared with 1994-98 average and 2009

Casualty mode of Travel	Casualty numbers			Percentage change in 2010 over	
	1994-1998 average	2009	2010	2009	1994-1998 average
Pedestrians	130	69	69	0%	-47%
Pedal cyclists	41	32	44	38%	8%
Powered two-wheeler	66	60	54	-10%	-19%
Car occupants	166	68	40	-41%	-76%
Taxi occupants	3	2	2	0%	-23%
Bus or coach occupants	6	7	3	-57%	-48%
Goods vehicle occupants	113	38	24	-37%	-79%
Other vehicle occupants	3	2	0	-100%	-100%
TOTAL	527	278	236	-15%	-55%

Source: Calculated from data provided by TfL, 2012

- HGVs were responsible for 3 per cent of total motorised vehicle kilometres on roads in London in 2010, and were involved in collisions that resulted in 3 per cent of total road traffic casualties. These collisions resulted in 16 per cent of total road traffic fatalities in London in 2010.
- In 2010, 99 people were killed and seriously injured in collisions involving HGVs in London.
- Of the 20 fatalities resulting from collisions involving HGVs in 2010, 11 were pedestrians, 3 were motorcyclists, 4 were car occupants, and 2 were pedal cyclists.
- Goods vehicles over 7.5 tonnes were involved in the majority of fatalities in collisions involving HGVs in 2010 (18 out of 20 fatalities).
- There were 7 fewer fatalities in collisions involving HGVs in 2010 than in 2006.
- The number of people killed and seriously injured in collisions involving HGVs was 63 per cent lower in 2010 than the 1994-1998 annual average. The number of slight casualties in collisions involving HGVs was 38 per cent lower over the same period.
- The number of fatal and serious injuries in collisions involving HGVs in London per vehicle kilometre travelled was 62 per cent lower in 2010 than the 1994-1998 annual average.

Figure 8: Casualties resulting from collisions involving HGVs in London by severity, 1990-2010



Source: calculated from data provided by TfL, 2012

Table 3: Fatal and serious casualties resulting from collisions in which HGVs were involved in London by mode of travel, 2010 compared with 1994-98 average and 2009

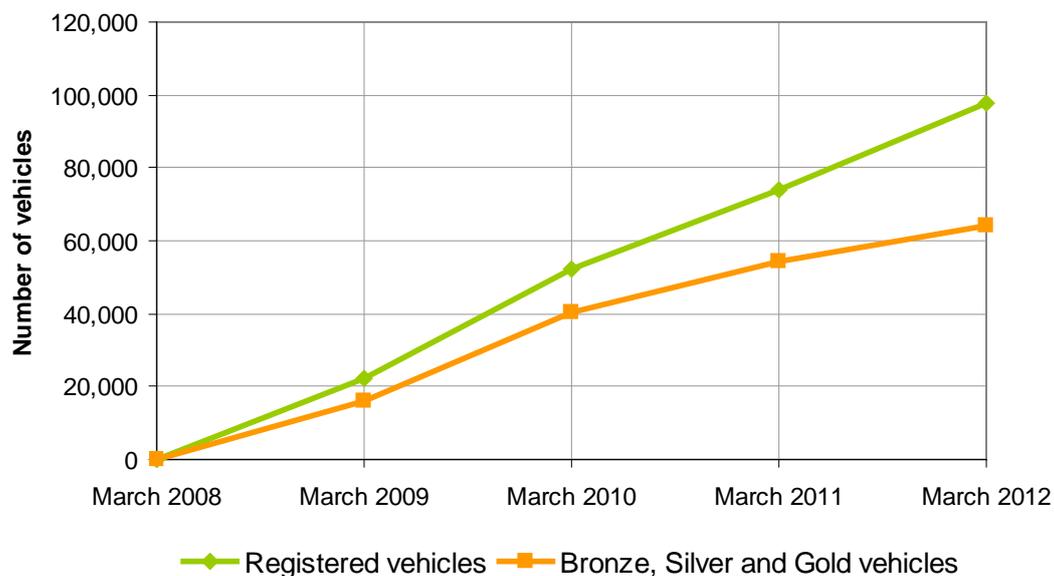
Casualty mode of Travel	Casualty numbers			Percentage change in 2010 over	
	1994-1998 average	2009	2010	2009	1994-1998 average
Pedestrians	53	45	27	-40%	-49%
Pedal cyclists	23	22	22	0%	-5%
Powered two-wheeler	27	11	8	-27%	-70%
Car occupants	106	25	35	40%	-67%
Taxi occupants	2	0	0	0%	-100%
Bus or coach occupants	9	5	1	-80%	-88%
Goods vehicle occupants	46	9	6	-33%	-87%
Other vehicle occupants	0	1	0	-100%	-100%
TOTAL	266	118	99	-16%	-63%

Source: Calculated from data provided by TfL, 2012

Road freight transport and the environment

- Road freight transport was estimated to be responsible for 17 per cent of ground-based transport CO₂ emissions in London in 2010, while cars and motorcycles accounted for 46 per cent.
- Road freight transport was estimated to be responsible for 24 per cent of road transport CO₂ emissions in London in 2010 - 13 per cent by HGVs and 11 per cent by LGVs (while cars and motorcycles accounted for 65 per cent).
- Road freight transport was estimated to be responsible for 38 per cent of road transport NO_x emissions in London in 2010 - 27 per cent by HGVs and 11 per cent by LGVs (while cars and motorcycles accounted for 36 per cent).
- Road freight transport was estimated to be responsible for 37 per cent of road transport PM₁₀ emissions in London in 2010 - 14 per cent by HGVs and 23 per cent by LGVs (while cars and motorcycles accounted for 52 per cent).
- The London Low Emission Zone (LEZ) scheme has achieved compliance rates of 98 per cent for phase 1 HGVs (over 12 tonnes gross weight), and 96 per cent for Phase 2 HGVs (between 3.5 tonnes and 12 tonnes gross weight). This reflects close to 100 per cent compliance for practical purposes, given a limited number of exempt and evading vehicles and the actual kilometres operated by these vehicles. The LEZ scheme has therefore helped to achieve a shift in the 'Euro Class' of the HGV fleet operating London with older, dirtier HGVs virtually eliminated, and thereby reduced NO_x and PM₁₀ emissions.
- The Freight Operator Recognition (FORS) Scheme is an accreditation scheme available free of charge to any company operating vans or lorries in London that provides operators with practical advice and guidance to help reduce fuel consumption, CO₂ emissions, vehicle collisions, and penalty charges through improving driver behaviour, vehicle and fleet management, and safety and efficiency in transport operations. By March 2012 approximately 100,000 goods vehicles operating in London have been registered in FORS, of which approximately 65,000 have achieved bronze, silver or gold accreditation.

Figure 9: Number of goods vehicles in FORS, 2008-2012

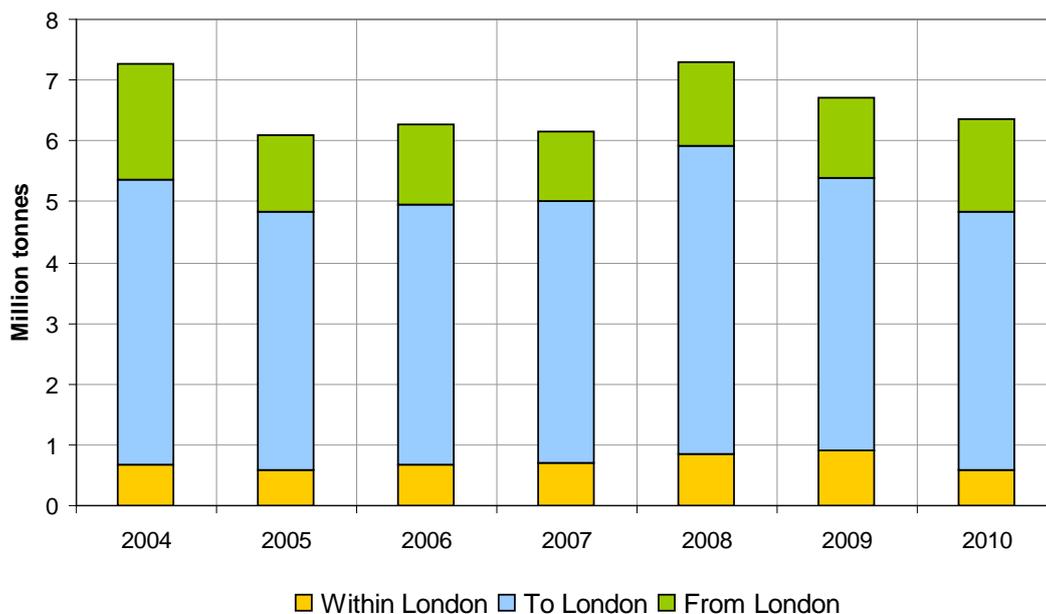


Source: TfL, 2012

Rail freight transport

- In 2010, 6.4 million tonnes of rail freight was lifted on journeys to, from and within London.

Figure 10: Goods lifted by rail on journeys to, from and within London, 2004-2010



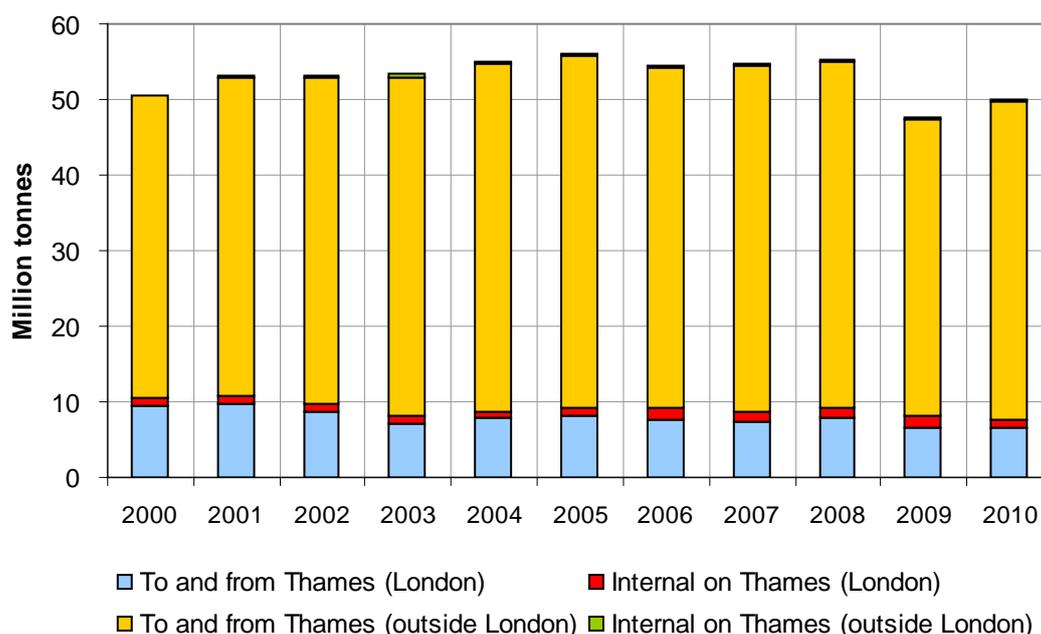
Source: Calculated from Network Rail data processed by MDS Transmodal, 2012

- London is a net importer of freight by rail from other parts of the country, with approximately three times as much by weight arriving as leaving in 2010.
- The rail freight lifted on journeys to, from and within London in 2010 represented 7 per cent by weight of the total rail freight lifted in Britain.
- The major rail freight flows to London in 2010 by weight were aggregates for the construction industry, while domestic waste was the biggest outward flow.
- The greatest inward flows to London in 2010 by weight came from the South West and East Midlands (together accounting for 73 per cent of goods transported by rail and unloaded at terminals in London).
- For goods loaded on to rail in London, more than half by weight (57 per cent) was moved to the South East and a further 33 per cent was intra-London traffic in 2010.
- In addition, considerable volumes of rail freight pass through London en route to and from other regions.

Freight on the river Thames

- There are approximately 80 operational wharves in the PLA (in and outside London).
- There are currently 50 safeguarded wharves on the Thames and its tributaries in London (some of which are actively used for freight transport and some of which are not currently in use).
- The Mayor of London published a consultation document in October 2011 which provides the results of a review of the safeguarding of wharves on London's waterways and recommendations for the future safeguarding or release of individual wharves.
- The Port of London Authority (PLA) was the UK's second most important port in terms of the weight of freight handled in 2010, handling approximately 50 million tonnes, which represented 10 per cent of all foreign and domestic tonnage handled at UK ports. The PLA is a net importer of freight by ship, with 83 per cent by weight of the total freight handled arriving at, and 17 per cent of the total freight handled departing from, PLA wharves in 2010.
- Approximately 49 million tonnes of foreign and coastwise goods were handled at wharves in the PLA in 2010. Approximately 7 million tonnes of these goods were loaded or unloaded at a PLA wharf within London.
- In addition, 1.2 million tonnes of goods were transported between wharves within the PLA in 2010. Of this, 0.1 million tonnes was moved between PLA wharves outside London, while 1.1 million tonnes was moved internally on the Thames in London (of which 0.8 million tonnes had either an origin or destination in London - with the loading or unloading taking place at a PLA wharf outside London, and 0.3 million tonnes was transported between two London wharves).
- Therefore the total weight of freight handled at PLA wharves in London in 2010 was 7.8 million tonnes (which represented 16 per cent of the total freight handled by weight at all PLA wharves). Approximately 90 per cent of this cargo handled in London was foreign and coastwise traffic (i.e. was transported between a wharf outside the PLA and a PLA wharf), while 10 per cent was moved between PLA wharves in London.

Figure 11: Goods handled at PLA wharves by type of movement, 2000-2010



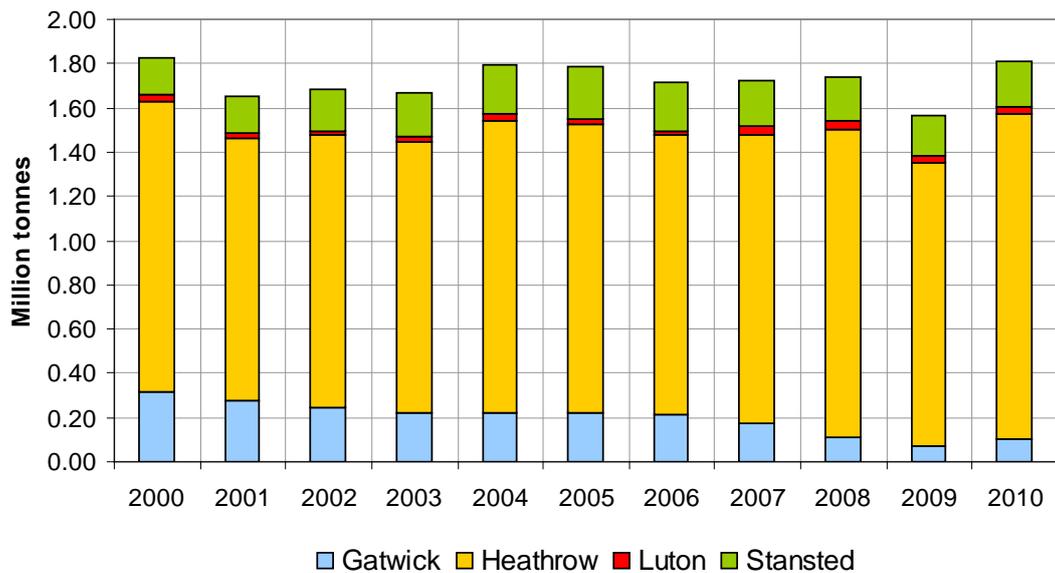
Source: Calculated from data provided by PLA, 2012

- The proportion of total PLA cargo handled by wharves in London by weight has fallen from 25 per cent in 1995 to 16 per cent in 2010. The relatively small proportion of freight (by weight) being handled within London is due to the fact that much of the bulk and unitised traffic is handled at the larger wharves in Kent and Essex.
- The most important commodities handled on foreign and coastwise movements to and from PLA wharves on the Thames (inside and outside London) in 2010 in terms of weight were unitised traffic, oil and aggregates. Together these commodities accounted for approximately 85 per cent of total foreign and coastwise goods handled.
- Four types of commodities were handled on internal movements between PLA wharves on the Thames (inside and outside London) in 2010. These were waste and dredged materials, aggregates, vegetable oils and oil seed, and other oil products. Aggregates and waste/dredged materials accounted for approximately 75 per cent of the total by weight.

Air freight transport

- Seventy eight per cent of the UK's air freight passed through the London area airports of Heathrow, Gatwick, Stansted and Luton in 2010. Air freight tonnages at London area airports have been relatively stable between 2000 and 2010, following a period of continuous growth prior to 2000.
- Heathrow is by far the most important airport in terms of the weight of freight lifted among the London area airports. It accounted for 81 per cent of all air freight handled by weight at London area airports in 2010.

Figure 12: Freight handled at London area airports by airport, 2000-2010



Source: CAA

- In addition, London area airports handled 54 per cent of all the UK's mail handled by air in 2010 (by weight). Heathrow accounted for 71 per cent of all air mail handled at London area airports in 2010.
- There was a net import of air freight into the London area airports in 2010, with approximately 1.0 million tonnes being set down and 0.8 million tonnes being picked up.

Glossary

Roads classifications

Major roads - include motorways and A roads. These roads usually have high traffic flows and are often the main arteries to major destinations.

Minor roads - B roads, C roads and unclassified roads and are all maintained by the local authorities.

Types of road goods vehicles

Light goods vehicles (LGVs) - commercial vehicles up to and including 3.5 tonnes gross plated weight. LGVs are commonly referred to as "vans".

Heavy goods vehicles (HGVs) - commercial vehicles of more than 3.5 tonnes gross plated weight.

Articulated goods vehicles - articulated vehicles have two parts: a motorised drawing unit known as a tractive unit (or motor vehicle) and a mounted trailer. These vehicles are over 3.5 tonnes gross plated weight and are therefore referred to as heavy goods vehicles (HGVs).

Rigid goods vehicles - a goods vehicle which has only one part (i.e. unlike an articulated vehicle it does not have a separate tractive unit and trailer). Rigid vehicles vary from two to four axles and are over 3.5 tonnes gross plated weight and are therefore referred to as heavy goods vehicles (HGVs).

Freight transport operations

Empty running - proportion of total vehicle kilometres that the goods vehicle is run empty.

Gross vehicle weight - the maximum permissible weight of the goods vehicle and its load.

Lading factor - The ratio of the actual tonne-kilometres to the maximum tonne-kilometres achievable if the vehicles, whenever loaded, were loaded to their maximum carrying capacity.

Operator licence (O-licence) - Operator (O) licensing is the regulatory control system used to ensure the safe and legal operation of heavy goods vehicles in the UK. An operator's licence is required to operate a motor vehicle with a gross plated weight of more than 3.5 tonnes (i.e. an HGV) on a road. An O-licence is required for HGVs used for both own account and public haulage operations.

Own account - goods vehicle operators who only carry goods in the course of their own trade or business.

Public haulage - goods vehicle operators who carry goods for other people (often also referred to as 'hire or reward').

Rail freight terminal - A facility designed to transfer goods from one train to another or between transport modes.

Foreign and coastwise traffic – goods transported between a wharf outside the PLA and a PLA wharf. These are referred to as movements “to and from the Thames” in Figure 12.

Internal on Thames (London) – these water-based movements in Figure 12 include those that are loaded and/or unloaded in London.

Safeguarded wharves - those wharves in London which have been given special status to ensure that they continue to be available for river freight transport use and are protected from redevelopment

Wharf - A landing place or pier where ships may berth and load or unload.

Acronyms for organisations

CAA - Civil Aviation Authority

DfT - Department for Transport.

GLA - Greater London Authority.

ONS - Office for National Statistics

PLA - Port of London Authority

TfL - Transport for London.

VOSA - Vehicle and Operator Services Agency

Other abbreviations and definitions used

CO₂ - carbon dioxide.

GVA - Gross Value Added (the difference between output and intermediate consumption for any given sector/industry. That is the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production).

Ground based transport – includes emissions from aircraft whilst taxiing and during the take-off and landing cycle (i.e., below one mile in altitude).

LEZ - Low Emission Zone

NO_x - the collective term for oxides of nitrogen

PM₁₀ - particulate matter: fine particles with an aerodynamic diameter of less than 10 microns which has several significant adverse health effects including heart disease, poor lung function and lung cancer.

SEMTA - South Eastern and Metropolitan Traffic Area (which includes London).

Severity ratio - the severity ratio is the proportion of fatal and serious injuries to total injuries.

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Network Rail
Port of London Authority (PLA)
Skills for Logistics
TfL Traffic Analysis Centre
TfL Better Routes and Places
The Traffic Commissioners
Vehicle and Operator Services Agency (VOSA)

References

Civil Aviation Authority (CAA) UK Airport Statistics.

<http://www.caa.co.uk/default.aspx?catid=80&pagetype=88&pageid=3&sglid=3>

Department for Communities and Local Government (2009) Floorspace and rateable value of commercial and industrial properties 1 April 2008 (England & Wales), Communities and Local Government.

<http://www.communities.gov.uk/documents/statistics/pdf/1179067.pdf>

Department for Transport (2012) Data provided by the Road Freight Statistics Team, DfT.

Department for Transport (2012) Data provided by the Vehicle Licensing Statistics Team, DfT.

Department for Transport (2011) Transport Statistics Great Britain: 2011, DfT.

<http://www.dft.gov.uk/statistics/releases/transport-statistics-great-britain-2011/>

Department for Transport (2011) Port Freight Statistics: 2010 final figures, DfT.

<http://assets.dft.gov.uk/statistics/releases/port-freight-statistics-final-2010/port-freight-statistics-full-summary.pdf>

Department for Transport (2009) TAG unit 3.9: Detailed Guidance on Major Scheme Appraisal in Local Transport Plans, DfT.

<http://www.dft.gov.uk/webtag/documents/expert/unit3.9.5.php>

Mayor of London (2011) The London Plan: Spatial Development Strategy for Greater London, July 2011, Greater London Authority.

<http://www.london.gov.uk/priorities/planning/londonplan>

Mayor of London (2011) Safeguarded Wharves Review 2011/2012: Consultation Draft, Greater London Authority.

<http://www.london.gov.uk/priorities/planning/spg/safeguarded-wharves-review>

Network Rail (2012) Rail freight data provided by MDS Transmodal.

Port of London Authority (PLA) (2012) Data provided by the PLA.

Skills for Logistics (2011) Data provided by Skills for Logistics.

Skills for Logistics (2010) United Kingdom Sector Skills Assessment, Skills for Logistics.

Traffic Commissioners (2011) Traffic Commissioners' Annual Reports 2010-2011, Department for Transport.
<http://www.dft.gov.uk/publications/tc-annual-report-2010-11/>

Transport for London (2012) Goods vehicle casualty and collision data provided by Better Routes and Places, Transport for London.

Transport for London (TfL) (2012) Road traffic data provided by Traffic Analysis Centre, Transport for London.

Transport for London (TfL) (2012) FORS data provided by FORS manager, Transport for London.

Transport for London (2010) Travel in London: Report 3, Transport for London.
<http://www.tfl.gov.uk/assets/downloads/corporate/travel-in-london-report-3.pdf>

Transport for London (2011) Travel in London: Report 4, Transport for London.
<http://www.tfl.gov.uk/assets/downloads/corporate/travel-in-london-report-4.pdf>

Transport for London (2007) London Freight Plan, Transport for London.
<http://www.tfl.gov.uk/microsites/freight/documents/publications/London-Freight-Plan.pdf>