London 2012: changing delivery patterns in response to the impact of the Games on traffic flows

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London 2012: Changing delivery patterns in response to the impact of the Games on traffic flows

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Abstract

The paper addresses road freight transport operations during the London Olympic and Paralympic Games in 2012. It presents work carried out prior to the Games to understand pre-Games patterns of freight deliveries in London (for both light and heavy goods vehicles) and the results of modelling work carried out to assess the likely impacts of the Games road restrictions on freight operations. The modelling results indicated that increases in total hours travelled carrying out collection and delivery work would range from 1.4 to 11.4 per cent in the six sectors considered. The results suggested increases in hours travelled in excess of 3.5 per cent in 4 of the 6 sectors modelled. The possible actions that could be taken by organisations to reduce these negative impacts were also modelled and the results indicated that such actions would help to mitigate the impact of the road restrictions imposed on operators during the Games**.** The actual impacts of the 2012 Games on transport both in general terms and specifically in terms of freight transport are also discussed, together with the success of the actions taken by TfL to help the road freight industry. The potential freight transport legacy of the London 2012 Games in terms of achieving more sustainable urban freight transport is considered and the steps being taken by Transport for London (TfL) to help ensure that such a legacy can be realised are discussed. Such steps include policy makers continuing to collaborate closely with the freight industry through the 'London Freight Forum', and TfL's efforts to encourage and support companies revising their delivery and collection times to the off-peak; improving freight planning in the design and management of TfL-funded road schemes; electronic provision of traffic information by TfL to the freight industry, and the further development of freight journey planning tools.

Keywords: freight transport, logistics, Olympic Games, London, urban

Introduction

The London Olympic Games featured approximately 11,000 athletes from more than 200 nations competing in 26 sports consisting of 300 events. The Games ran for 16 days from 28 July to 12 August 2012. The London Paralympic Games commenced 18 days after the Olympic Games Closing Ceremony. This comprised 4,200 athletes with a disability from 162 countries competing in 20 sports. The Paralympics ran for 11 days from 30 August to 9 September 2012.

In order for London to meet its commitment to an efficient transport service for athletes, officials and others it required a number of transport measures will be put in place on the London road network. These measures included: the Olympic and Paralympic Route Networks (ORN / PRN) which linked competition and key non-competition venues; dedicated

Games lanes on certain stretches of the ORN / PRN; and revised waiting and loadings restrictions on the ORN/PRN. There was a potential conflict between providing fast and reliable transport services to those visiting and participating in the London 2012 Games while at the same time ensuring that the Games-related traffic did not have a negative impact on freight deliveries in London.

The paper analyses pre-Games patterns of freight deliveries in London (for both vans and lorries) and presents the results of modelling work carried out to assess the likely impacts of the Olympic road restrictions on freight operations, and the possible measures that could be taken by organisations to reduce these negative impacts. The actual transport impacts on the Games both in general terms and specifically in terms of freight transport are also discussed, together with the potential freight transport legacy.

Road freight traffic in London

A starting point in the study was an assessment of pre-Games road freight traffic in London performed by light and heavy goods vehicles (LGVS and HGVs). In 2009 HGVs and LGVs travelled a total of 1.0 and 4.1 billion vehicle kilometres in London respectively. HGV and LGV activity accounts for 16 per cent of all vehicle kilometres on London's roads (see Table 1).

An estimate of annual vehicle kilometres travelled by LGVs and HGVs was obtained from was based on data for annual vehicle kilometres travelled by LGVs and HGVs provided by the Transport for London (TfL) Road Network Performance Team. Assumptions were then applied to the data to derive daily vehicle activity by trip purpose. In 2009 HGVs and LGVs travelled a total of 1.0 and 4.1 billion vehicle kilometres in London respectively. HGV and LGV activity accounts for 16 per cent of all vehicle kilometres on London's roads (see Table 1). TfL data indicates that LGVs and HGVs performed 59 per cent and 84 per cent respectively of their total distance travelled in London on major roads (Transport for London 2011a).

Table 1. Total vehicle kilometres travelled on roads in London in 2009 by vehicle type (billions and percentages)

	Vehicle kms (billion)	**Proportion**
Cars and taxis	25.4	80%
Two-wheeled motor vehicles	0.8	2%
Buses and coaches	0.6	2%
Light goods vehicles	4.1	13%
Heavy goods vehicles	1.0	3%
Total	**31.9**	**100%**

Source: TfL, 2011.

Figure 1 shows the annual vehicle kilometres travelled by HGVs and LGVs in London since 1993. This indicates that HGV traffic has remained relatively stable over the entire period,

while LGV traffic rose between 1993 and 2007, and then fell to 2009, with the onset of the recession (Transport for London 2011a).

In order to estimate LGV and HGV vehicle kilometres taking place in London on an average weekday by activity purpose it was necessary to take account of several factors and apply suitable assumptions to the annual activity data. First, not all LGV activity is associated with goods transport. In fact, data suggests that the majority of LGV activity is accounted for by other journey purposes (including the provision of services, commuting, and personal travel). Data from the DfT Company Van Survey 2003-2005 and Privately-Owned Van Survey 2002-2003 indicates that at a national scale only approximately 30 per cent of LGV vehicle kilometres are accounted for by goods transport, while servicing activity accounts for approximately 25 per cent of vehicle kilometres and commuting and private activities account for approximately 45 per cent of vehicle kilometres (Department for Transport, 2004, 2008). It was assumed that all HGV activity was for the purpose of goods transport. Second, not all LGV and HGV activity associated with goods transport involves laden vehicles; some vehicle activity takes place with the vehicle running empty. The DfT CSRGT estimates that between 2005 and 2009 approximately 30 per cent of HGV kilometres were run empty on all journeys to, from and within London (Department for Transport, 2010). The DfT Company Van Survey 2003-2005 suggests that empty running among LGVs is approximately half the HGV rate (Department for Transport, 2008).

Table 2 shows the estimate of the total number of LGV and HGV vehicle kilometres in London on a typical weekday by type of activity. LGV activity was subdivided into: goods transport activity, servicing activity, and commuting and private activity. Goods transport activity by LGVs and HGVs have been subdivided into laden and empty activity.

Table 2. Estimated LGV and HGV vehicle kilometres in London on a typical weekday in 2009

Activity type	LGV vehicle km (million)	HGV vehicle km (million)	LGV + HGV vehicle km (million)
Goods transport (laden)	4.2 (26%)	2.8 (70%)	7.0 (34%)
Goods transport (unladen)	0.7 (5%)	1.2 (30%)	1.9 (10%)
Service provision	4.1 (25%)	0 (0%)	4.1 (20%)
Commuting and private	7.3 (45%)	0 (0%)	7.3 (36%)
TOTAL	**16.3 (100%)**	**4.0 (100%)**	**20.3 (100%)**

Source: estimated from data provided by TfL, 2011.

Cordon traffic count data also provides insight into LGV and HGV activity in London. Analysing cordon traffic count data by time of day provided insight into the times of day at which LGVs and HGVs carry out their activities in London. Locations of traffic counts for monitoring long-run trends in traffic flows in London are organised to form three cordons: (i) Boundary cordon: roughly corresponding to the boundary of Greater London and entirely within the M25 orbital motorway, (ii) Inner cordon: enclosing an area similar to the inner London boroughs, and (iii) Central cordon: a cordon, enclosing central London, situated outside the Inner Ring Road and within a radius of 2.5 to 3 km from Aldwych.

This cordon data shows that approximately 87,000 LGVs and 26,000 HGVs enter central London on a typical weekday (which accounts for 15 per cent and 4 per cent respectively of all motorised vehicles entering central London – see Table 3) (Transport for London, 2011a).

Table 3. Typical weekday 24-hour inbound vehicles crossing the London cordons (thousands and percentages)

Time period	Boundary cordon		Inner cordon		Central cordon	
	Number	Proportion	Number	Proportion	Number	Proportion
Cars and taxis	1,000	79%	715	75%	402	68%
Two-wheeled motor vehicles	18	1%	33	3%	41	7%
Buses and coaches	13	1%	27	3%	31	5%
Light goods vehicles	168	13%	142	15%	87	15%
Heavy goods vehicles	62	5%	41	4%	26	4%
Total	**1,260**	**100%**	**959**	**100%**	**587**	**100%**

Source: TfL, 2011.

Table 4 shows the proportion of inbound LGVs and HGVs crossing each cordon by time period. This indicates that the vast majority of inbound vehicle movements for goods and service provision take place between 06:00 and 18:00 (approximately 80 per cent of these inbound vehicle movements) (Transport for London, 2011a).

Table 4. Proportion of inbound LGVs and HGVs crossing the London cordon counts by time period

Time period	Boundary cordon		Inner cordon		Central cordon	
	LGV	HGV	LGV	HGV	LGV	HGV
00:00-05:59	4%	8%	5%	9%	8%	11%
06:00-11:59	46%	46%	51%	50%	46%	48%
12:00-17:59	36%	35%	32%	33%	34%	31%
18:00-23:59	14%	11%	12%	9%	12%	10%
24-hours	100%	100%	100%	100%	100%	100%

Notes: Cordon counts are based on 16 hour (06:00 to 22:00) manual classified counts using six minute in fifteen sample counts. Night-time flows are estimated based on a sample of sites which are counted for the full 24 hours. Boundary and central cordon data is based on 2004-2009 annual average, inner cordon data is based on 2005-2010 annual average.
Source: TfL, 2011.

Various data sources were combined to estimate the types of goods vehicle activity underway during different periods of the day including the morning (AM) peak, the inter-peak and the afternoon (PM) peak periods, further distinguishing for LGVs the type of activity being carried out (see Table 5).

Table 5. Proportion of LGVs by trip purpose and HGVs occurring by time period

Weekday period		LGV				HGV
	Duration	**Service**	**Outbound commuting**	**Return commuting**	**Collection & delivery**	**Collection & delivery**
Other	19.00-06.59	11%	32%	14%	11%	23%
AM peak	07.00-09.59	22%	48%	4%	23%	25%
Inter-peak	10.00-15.59	56%	16%	37%	57%	46%
PM peak	16.00-18.59	10%	4%	45%	9%	6%
24-hour		100%	100%	100%	100%	100%

Source: Own estimation, based on combining data from TfL Cordon counts, TfL CRISP RSI Surveys and DfT's LGV Surveys of 2003-05.

Important findings that can be drawn from this analysis in Table 5 include that for return commuting trips on LGVs, almost as many commence before 16.00 hours as after it; the latter are skewed towards the hour 16.00 to 17.00, with a declining percentage thereafter. For all other LGV trip purposes as well as for HGV movements, the proportion in the PM peak is much lower than that found earlier in the day. The reason for this is that on average goods vehicle usage starts earlier in the day than that of cars, so that a high number of goods vehicles are already on the road before 07:00. Because the goods vehicle drivers start early in the morning, they also tend to finish work in the afternoon, rather than later in the evening peak period.

This indicated that overlapping use of the road network by goods vehicle movements and Games traffic was likely to be most pronounced from the early morning (06:00) through the afternoon (to 17:00), by which time most service and delivery activity is scaling down, with the majority of goods vehicles returning to base rather than initiating new service or delivery activity. An important exception would be those vehicles picking up parcels, post and courier items at the end of the business day.

In the early morning, the period of intense LGV and HGV activity would be likely to overlap with that of important Games movements. For example, the Olympic Stadium, would typically host two sessions per day; one in the morning, then another starting mid-afternoon and lasting through the evening. The arrivals and the departures from the first session as

well as the arrivals to the second session would all potentially occur during periods of high levels of goods vehicle activity. In other venues with a single session that did not commence too early in the morning, the highest level of LGV activity may already have passed by the main time of travel of Games participants and spectators.

In the PM peak it was predominantly the car traffic, rather than the goods vehicle traffic, that would potentially overlap with the Games traffic. The reduction in the goods vehicle traffic as the afternoon progresses would be more than compensated by the increase in car traffic such that total traffic would potentially be significantly higher in the PM than in the AM peak, leading in turn to slower speeds on average in the PM than in the AM peak for each of Central, Inner and Outer London.

Road restrictions for the London 2012 Games and their likely impacts

In order to achieve the rapid transport of 80,000 athletes, officials, sponsors and the media to the London 2012 sites (as well as goods and other equipment) an ORN / PRN (Olympic / Paralympic Route Network) was planned to be put in place across London's road network. The ORN /PRN was the series of roads around London and the UK that would link competition venues and key non-competition venues. The ORN would total 105 miles in London and 173 miles outside London and would be roadwork free and subject to measures such as traffic signal timing changes. The ORN would be in force from July to September 2012 on 2.6 per cent of London's roads (ODA, 2010a). Almost sixty miles of the ORN in London would consist of dedicated lanes. Dedicated lanes to transport athletes, officials, sponsors and the media to venues were also used at the Athens and Beijing Games (Currie and Delbosc, 2011).

Other measures to be used on the ORN / PRN included the prevention of right turns, side road closures, changes to traffic lights and pedestrian crossings, adjustments to bus and coach stops and the temporary suspension of bus stops. There would also be additional parking restrictions and road closures around the sites and during on-street events (including the marathons, road cycling, triathlon, and race walks as well as cultural events). Stopping on the ORN / PRN was only to be permitted between midnight and 06:00, and journey times to central London businesses that were not on the ORN / PRN but were surrounded by it or which were close to event and non-event venues were likely to be longer than normal. Responsibility for the ORN / PRN was transferred from the ODA to TfL (Transport for London, 2011b). These restrictions were considered to be potentially challenging to London businesses.

The ODA suggested in 2010 that the transport arrangements necessary for the Games would have a negative impact on deliveries and collections in the rest of London. It stated that the road restrictions put in place across London would affect goods and service provision at establishments and that businesses may not be able to receive goods and services at their usual times, with operations at some locations not being possible at all at certain times (ODA, 2010b). An investigation set up by the London Assembly Transport Committee into the transport arrangements for the Games also raised concerns about the potentially serious knock-on effects on traffic congestion and businesses in London (London Assembly, 2010). The Freight Transport Association (FTA) expected traffic restrictions being put in place for the Olympics to cause three types of disruption for non-Games road freight transport in London: i) journey time unreliability arising from the reduction in road space and transfer of traffic onto other routes, ii) difficulties accessing specific roads that are either closed or subject to banned right turns, and iii) difficulty stopping on-street to load and unload as kerbside access would be affected by the restrictions (Freight Transport Association, 2011). The impacts of the Games road restrictions would vary by sector, but two operational outcomes were likely:

- average journey lengths may increase, leading to an increase in total vehicle kilometres travelled, and

- the average journey speeds and loading/unloading speeds may fall, leading to an increase in the total time taken to carry out freight operations and less predictable journey times.

Without pre-planning by businesses both of these outcomes could result in business continuity issues, empty shelves and greater costs for companies; and if unconstrained, would lead to more freight vehicles on the road.

Analysis identified that the types of goods flow most likely to be affected by the Games road restrictions were: (i) time critical goods and service supply requirements, (ii) regular goods replenishment, (iii) products that have a short shelf life, and (iv) operations that involve many delivery legs (i.e. multi-stop) and require frequent kerbside access. This analysis suggested that sectors likely to be worst affected included: retail (food and non-food); restaurants, pubs and cafes; hotels; and hospitals and other health care providers (especially in relation to medical emergencies). Logistics operators most likely to be affected were identified as: those specialising in fast-moving consumer goods; fresh food; parcels, courier and postal operators; cash and valuables-in-transit operators; and waste collection operators. The logistics industry contains some large companies but also many smaller firms. However influencing the resulting 'tail' of small and single owner-operator vans would be required as these are critical to supporting SMEs. Service operators providing rapid response and emergency services (such as utility companies; and electrical/plumbing providers and individual contractors) were also identified as potentially being highly affected.

In terms of the geographical impact of the road restrictions for the Games, the analysis suggested that establishments located on or close to the ORN / PRN, Central London Zone and Venues were likely to be affected in terms of journey duration and journey time reliability, as well as experiencing difficulties in finding on-street stopping locations for loading/unloading/servicing activities.

Establishments not located close to the ORN / PRN, Central London Zone and Venues, may also experience journey time unreliability if they received visits from vehicles that needed to use roads on or near the ORN /PRN on the journey to them. In addition these areas could be seriously impacted by the active traffic management regime in controlling access onto and across the ORN / PRN. This was especially likely in the case of vehicles that make multi-stop journeys on or close to the ORN / PRN – such journeys could suffer delays that have repercussions for all establishment served on the journey regardless of their proximity to the ORN / PRN.

Modelling the impacts of road restrictions during the Games

Modelling of the implications of the ORN on freight movements used a strategic logistics network planning model. The model had the ability to examine the different flows of goods, or distribution channels, from supply points through a network of storage and transhipment facilities to customer delivery locations. The techniques applied in this model have been used extensively by commercial organizations to minimize costs and maximize service levels, and it is now being used more frequently by governmental departments to assess policy and sustainability issues of various logistics networks. The model is a single integrated application used specifically to address supply chain network problems. Supporting this software is a road network used for calculating times and distances between the various points such as depots and customers. In the London area, encompassing the

region within the M25, this digitized road network comprises a set of nodes representing some location such as a motorway exit, junction, roundabout, traffic lights, or a change in road category, and a set of links which contains information about the stretch of road connecting the nodes.

Data requirements for this type of modelling exercise include flow information with origin and destination locations, the frequency of movement and quantity moved between these two points, and the type of vehicle used. Transport operating parameters for each vehicle are also required, including vehicle capacity, operating hours, shifts, fixed and variable collection and delivery times and typical fuel consumption. The flow data used in this project comprised six sets of data: (i) the "fast-moving consumer goods" (FMCG) sector based on data comprising the operations of six of the top eight supermarket retailers, plus wholesalers and major manufacturers in London, (ii) a major food service company that services thousands of local shops and restaurants in London and their delivery sizes are relatively smaller than the other companies in the FMCG data, (iii) transport movements into and out of the five London wholesale markets, (iv) household waste collection transport and volume by London borough, (v) home delivery of parcels in London from a major parcels carrier, and (vi) movements of large retail items (involving two-man delivery) in London from three major retailers.

The outputs from the modelling were expressed in terms of changes to the total vehicle hours required to perform the work in each of the sectors analysed. It must be noted there is not a direct translation from theoretical vehicle hours to the number of additional vehicles, as drivers hours legislation comes into play in practice.

Assuming a reduction of 20 per cent in speeds on and in the vicinity of the ORN the modelling results showed increases in total hours travelled carrying out collection and delivery work for all six sectors modelled, ranging from 1.4 per cent (parcels - primarily home delivery, business to consumer movements) to 11.4 per cent (wholesale markets - all business to business movements). The results suggested increases in hours travelled in excess of 3.5 per cent in 4 of the 6 sectors modelled. An increase in the time taken to carry out collection and delivery work in London would result in additional labour and vehicle requirements and hence an increase in operating costs.

It was forecast that the UK will experience an additional £750 million consumer spending in the seven-week period of the Games; the vast majority of this additional spending will be made by international visitors and will occur in London (Visa Europe, 2011). The sectors likely to benefit most from this additional expenditure were retail and leisure (hotels, food and drink, entertainment and travel) which would also lead to an increase in the demand for goods flows.

Modelling was therefore also carried out in which it was assumed that in addition to 20 per cent lower vehicle speeds on and in the vicinity of the ORN there would also be a 10 per cent increase in demand for retail goods and food and drink during the Games. The results indicated that in this scenario total vehicle hours would increase by 14-16 per cent if the additional goods demand was met by operators making more deliveries (i.e. by increasing their delivery frequency).

Modelling of mitigations

The ODA and TfL produced guidance for London businesses informing them that they should consider altering their freight and logistics systems to avoid problems (ODA, 2010b). Their advice to businesses receiving, sending and carrying out goods delivery and collection work and servicing activity was to consider the so-called '4Rs': reducing activity, re-timing

activity, re-routeing activity, and revising the transport mode used where possible. Specific solutions put forward included: receiving and collecting goods at less busy times and on less busy days, assessing whether fewer goods could be received during the Games and reviewing which deliveries were essential; stockpiling non-perishable goods in advance of venue and on-street events, sharing resources and deliveries with other local businesses, changing the goods delivery point, considering whether there were alternative locations to receive deliveries, and planning alternative routes to avoid congestion hotspots. TfL worked closely with businesses and other organisations likely to be affected by the road restrictions during the Games to develop action plans to address these issues (Transport for London, 2012a). The actions that companies could take to mitigate the Games road restrictions mainly fell into two broad categories:

- Increasing the grouping of freight transport (through measures such as ordering less frequently, sharing deliveries with neighbouring businesses, using urban consolidation centres etc.)

- Changing the time at which freight transport activities take place to when the ORN restrictions are not in force

Actions taken to increase the grouping of freight transport would be expected to increase vehicle load factors and reduce vehicle empty running, thereby leading to reductions in the vehicle hours and kilometres travelled. Actions taken to shift the times at which freight transport takes place to the off-peak/night would be expected to lead to faster vehicle speeds for these off-peak journeys, and hence also reduce total vehicle hours.

The modelling results indicated that both of these actions had the potential to play an important role in helping to minimise the consequences of the road restrictions imposed during the Games. It was calculated that if a transport operator could make use of out of hours deliveries (00:00-06:00 hours) this could lead to a reduction in total vehicle hours required of over 6 per cent. Reducing the number of deliveries and collections made during the Games by grouping deliveries would also result in substantially lower total vehicle hours in 4 out of the 6 sectors modelled.

What actually happened during the London 2012 Games

Short-term economic effects of the Games

Available data suggests that the London 2012 Games did help to contribute to UK economic growth. Office for National Statistics data shows that the UK economy grew 1 per cent in the third quarter of 2012, emerging from recession in the three months from July to September. The ONS calculated that Olympic and Paralympic Games generated about £580 million in ticket sales and that this added 0.2 per cent to the level of GDP in the third quarter of 2012 (ONS, 2012a).

The Games may not have had the hoped for effect on retail growth. British Retail Consortium data show retail sales in the UK were 4 per cent lower in August 2012 than the same month in the previous year (BBC, 2012). Some retailers felt that warnings from the government and the Mayor of London to stay away from central London to avoid crowding had deterred shoppers (Alleyne and Ford Rojas, 2012).

Evidence on the effect of the Games on tourism has been mixed, with fewer people visiting Britain but those that do spending more on average. ONS figures show that the number of visits to the UK by overseas residents in August 2012 was 5 per cent lower than the same month in 2011 (ONS, 2012b). The number of sea passengers arriving and departing at UK

ports was respectively 15 and 10 per cent lower in July and August 2012 than the same months in 2011 (Department for Transport, 2012). There was also approximately 1-2 per cent fewer arrivals and departures at UK airports in July and August 2012 compared to the same months in 2011 (Department for Transport, 2012). International Passenger Survey data showed 4 per cent fewer visits to the UK by overseas residents in July – September 2012 compared with the same period in the previous year. However, the average amount spent by Olympics visitors was approximately twice as much as the average spent by other visitors (ONS, 2012b). Some tourist sites reported fewer visitors during the Games than during the same period in 2011 (Smithers, 2012).

General transport impacts of the Games

Using August 2011 as a representative baseline, road traffic reductions of between 6-7 per cent in central London, 1-3 per cent in inner London, and increases of 1-3 per cent in outer London were experienced across both the Olympics and Transition period before the Paralympics (largely August 2012). Road traffic conditions during the Paralympics (in September 2012) were very close to 'business as usual' (Transport for London, 2012b).

A greater proportion of road traffic took place in the overnight hours compared to normal during the Olympics. In central London there was 13 per cent more traffic in the period from midnight to 07:00, and in outer London there was 16 per cent more. Morning peak (07:00-10:00) traffic in central London during the Olympics was 13 per cent below the non-Games baseline, with inter-peak traffic 12 per cent down and evening peak traffic down by 11 per cent. During the Paralympics road traffic showed similar time shift patterns but were less marked than during the Olympics (Transport for London, 2012b).

Average traffic speeds at the Greater London level during the Olympics, transition and Paralympics period were "close to what would otherwise have been expected given prevailing levels of traffic demand, and allowing for a degree of capacity removal from Games time traffic management measures. The same applies to journey time reliability for general traffic, with over 91 per cent of non-Games journeys completed reliably during the Olympics, and over 89 per cent during the Paralympics (compared to normal values of between 89 and 90 per cent)" (Transport for London, 2012b).

Public transport was heavily used during the Games with the Underground carrying the majority of passengers. During the Games, Underground passengers were 28 per cent higher than in the equivalent period in 2011. Tuesday 7th August was the busiest day in the Tube's history, with 4.57 million passengers carried. This demand was met by running more trains during normal service hours, particularly in the evening and late into the night to cope with returning spectators (Transport for London, 2012b).

London's transport network therefore functioned well during the period of the Olympic and Paralympic Games. However, it has been suggested that the communications campaign which advised people to avoid using public transport because of crowding was over-cautious (London Travel Watch, 2012).

Freight industry actions and experiences during the Games

Large scale telephone surveys with businesses and freight operators were carried out by TfL before and during the Games to establish its impact on business activity, the effectiveness of their plans to minimise disruption, and any long term impacts. The results showed that 91 per cent of businesses and 85 per cent of freight operators said that they were ready for the Games. Fifty eight per cent of freight operators and 57 per cent of businesses made some sort of change to their operations as a result of the Games. Larger businesses were more

likely to have changed with 72 per cent of businesses with a turnover over £10m having made a change compared with 54 per cent of those with under £10m turnover (Transport for London, 2012b).

Of the '4Rs' (i.e. reducing activity, re-timing activity, re-routeing activity, and revising the transport mode) that businesses were encouraged to consider implementing to cope with the Games, the survey work shows that 'Reduce' and 'Re-time' options proved the most popular (with 45-50 per cent of respondents taking initiatives in these areas), followed by 'Re-route' (with about 40 per cent of freight operators and 25 per cent of businesses adopting initiatives in this area), while the least popular were options around revising the mode of transport (with only 5 per cent of businesses and freight operators changing the mode used) (see Figure 2) (Transport for London, 2012b).

The most popular 'Reduce' measures adopted by businesses and freight operators (in order of importance with the most adopted first) included: ensuring that deliveries were right first time, postponing non-essential deliveries, stockpiling, consolidating journeys, staff taking leave, staff working from home, sharing resources, and operating a temporary stockroom. The most popular 'Re-time' measures adopted (in order of importance with the most adopted first) included: and changing delivery and collection times, pre-ordering and pre-delivery of goods, changing staff starting times or shifts, and running out of hours operations. Figure 3 shows changes in the times of HGV operations in central London during the Games period compared with prior to it, indicating the shift to off-peak activity. 'Re-route' measures adopted (in order of importance with the most adopted first) included: avoiding congestion hotspots, avoiding traffic management restrictions, and the use of alternative locations. 'Revise mode' measures adopted (in order of importance with the most adopted first) included: walking, cycling, and river-based deliveries (Transport for London, 2012b).

Survey work carried out with freight operators and other businesses who were members of the Central London Freight Quality Partnership (CLFQP) following the end of the Games provided insight into the actions taken by companies. Parcel carriers reported taking actions including: starting delivery rounds earlier; out of hour deliveries including early morning, evening and nights; re-planning of delivery rounds; relaxing of time guarantees; double-manning of vehicles; use of motorcycles and walkers; transfer of some product to other depots; and depots staffed for longer periods than normal to cope with early starts and late finishes. Other freight operators and receivers reported taking actions including: utilisation of dedicated planning tools that incorporated all Games-related restrictions; risk assessment by matching of customer locations with restricted postcodes to identify possible road-related problems; evening and night deliveries to locations close to and on the ORN; delivery rounds commencing up to 3 hours earlier than normal; work reallocated to other depots; additional staffing and vehicles on-standby if required; planning of changed delivery times in advance with customers; and daily conference calls with customers.

A survey by the London Chamber of Commerce found that 51 per cent of respondents made changes to their usual freight transport arrangements to help avoid delivery disruptions during the Games. The results showed that "24 per cent of respondents postponed non-essential orders, 19 per cent used alternative delivery methods, 18 per cent had deliveries at different times, 13 per cent used alternative suppliers and 15 per cent ordered larger quantities in a smaller number of deliveries" (London Chamber of Commerce, 2012). Company inaction was due either to their local areas being unaffected or because client requirements prevented deliveries outside normal working arrangements.

Research carried out by TfL into goods vehicle traffic volumes indicates reductions of about 10 per cent in volumes of longer vehicles (those greater than 5.2 metres in length) during the

Olympic period against levels that would otherwise be expected (Transport for London, 2012b).

In terms of changes in the time of goods vehicle operations in London as a whole, the data suggests a relative shift towards a greater proportion of LGV journeys being made overnight. However, there appears to have been no relative reduction in van traffic in the morning peak period. For HGVs the data indicates substantial relative proportionate increases in journeys made overnight, together with reductions in the proportion of lorry traffic across the working day. In central London, these changes in the time of goods vehicle operations during the Olympics were even more marked than in London as a whole for both LGVs and HGVs with greater relative use during the night, and less relative use during the day than in 2011 (Transport for London, 2012b).

The London Chamber of Commerce survey reported that 54 per cent of respondents experienced no delivery disruptions during the Games. Many respondents had no difficulty in continuing their usual delivery schedules, with some freight operators and suppliers finding no interest for night deliveries among their customers. Only fourteen per cent of respondents reported supply disruptions during the Games (London Chamber of Commerce, 2012). This suggests that changes in road traffic conditions in London during the Olympics are likely to have played a role in the prevention of freight transport disruptions as well as the actions taken by companies.

Legacy of the London 2012 Games for freight transport

Despite the adoption of the initiatives discussed above by businesses and freight operators it is rather unclear how necessary they were in order to avoid supply chain disruptions given the reductions in total road traffic in central and inner London during the Games. However, the Games did provide an opportunity for companies to implement a wide range of measures that they may not have otherwise ever attempted. TfL and other public bodies are hopeful that having adopted these initiatives during the Games, companies will continue to use them. This would constitute an important legacy for freight transport in London and would thereby potentially have a long-term downward impact on freight intensity and the negative impacts of freight. In addition companies located outside London may also choose to adopt such practices based on the experiences of businesses operating in London and the publicity surrounding the Games.

In terms of the lessons learned from the Games experience by respondents to the CLFQP survey, parcel carriers reported: the importance of correct and timely information in coping with such an event and ensuing that operations could be successfully maintained in a worst case scenario but that achieving this had a negative impact on operating costs; the important role of communication within companies, between supply chain partners and with public sector bodies; that forecasts of increased road traffic levels during the Games were overestimated; and that carriers would now be more prepared for similar other future major events. Other operators and receivers reported that lessons learned included: the planning of details with all partners in the supply chain both public and private was very important; road information is essential for pre-planning and day-to-day operations in such a situation; obtaining and then transmitting information and knowledge throughout the organisation was valuable to success; and that communication with local residents in situations where out-of-hours deliveries were to take place was helpful.

Research has indicated that only a small proportion of businesses and freight operators continued to persist with the operational measures they took (i.e. the ‘4Rs’) during the London 2012 Games. Approximately 10 per cent of businesses and 7 per cent of freight operators that reduced deliveries during the Games continued to do so afterwards (which is

equivalent to approximately 1.5 per cent of all businesses and freight operators surveyed). Approximately five per cent of all businesses and three per cent of all freight operators surveyed have continued to make deliveries at revised times following the London 2012 Games (Transport for London, 2013a).

Business respondents noted barriers to reducing the number of deliveries once the 2012 Games had finished that included lack of support from customers, and the difficulties of reducing deliveries in the case of perishable goods. In the case of retiming deliveries, reported barriers to continuing these practices after the end of the Games included operating cost increases, lack of support from customers and delivery time restrictions (Transport for London, 2013a).

In terms of the impact of reducing the number of deliveries during the 2012 Games, approximately half of businesses and freight operators that adopted this measure experienced no change in operating costs, approximately one-quarter reported cost increases, approximately 5 per cent experienced cost savings, and the remainder did not know the effect on their costs (Transport for London, 2013a). When asked about expected cost impacts if continuing with this practice after the end of the Games approximately 60 per cent of businesses and freight operators expected no cost savings or increases, while most of the remainder expected increases in operating costs (Transport for London, 2013a).

Approximately half of all businesses and freight operators that revised the times of deliveries during the London 2012 Games experienced no change in operating costs, while approximately one-third reported cost increases, only 3 per cent experienced cost savings, and the remainder did not know the effect on their costs. However, most of these businesses and freight operators surveyed expected costs to increase if they continued to revise their delivery times after the 2012 Games (Transport for London, 2013a).

Some of these measures taken by companies to avoid freight transport disruption during the Games have been reported by other sources as leading to extra effort and additional costs (Chapman, 2012; London Assembly Transport Committee, 2012; London Chamber of Commerce, 2012).

In the case of freight transport measures that incur additional costs and efforts for companies it will be necessary for such measures to also provide commercial benefits if a business case is to be made for adopting and continuing with them in the long-term. Without such a business case the implementation of such operating measures are only likely to be adopted by companies for a short period of time during exceptional situations to ensure business continuity. As noted by TfL, “It is therefore difficult to see night time deliveries being used extensively by the industry without any other motivational factor in place” (Transport for London, 2013a).

However, although only a small proportion of businesses and freight operators have continued to reduce the number of deliveries or revise the timing of their operations outside of peak hours following the end of the London 2012 Games, this demonstrates that for some organisations the Games has instigated new ways of working. Also, the far higher proportion of organisations that adopted these practices during the Games indicates the scope for far greater levels of change given a suitable business case in which benefits outweigh costs.

TfL has recognised that the 2012 Games has led to much progress in identifying shared priorities between the public and private sector in relation to road freight transport, and the potential that exists for long-term change in freight operating practices in London. TfL ran workshops with industry representation after the close of the 2012 Games to reflect on lessons learned and scope for achieving legacy outcomes for freight transport in London.

This has led to the publication of a report in which TfL has noted the positive engagement and collaboration that was developed with the freight industry during the Games, especially through the 'London Freight Forum' which became the central focus for improving communication between TfL and the industry (Transport for London, 2013b).

In this report TfL has outlined a range of steps it will take to help ensure such a legacy. As well as building on the 2012 Games freight initiatives, this legacy needs to also take account of the forecast growth in London (with 1.25 million more people and 750,000 new jobs by 2031) and the efforts to improve road safety and encourage greater levels of cycling. These steps include: improving TfL road planning to ensure that freight activities are paid due consideration in the design and management of TfL-funded road schemes; developing means by which revised off-peak times for delivery and collection work can be encouraged; and further enhancing communication with and to the freight industry, for both planning and increasing awareness of potential solutions (Transport for London, 2013b).

TfL and the freight industry is viewing the potential for increased levels of out-of-hours delivery work as a desirable operational change resulting from the Games. Studies and trials had already been exploring this topic in recent years. The Games has given this initiative much publicity and has also given companies the opportunity to see that it is practical. It is hoped that this will result in more companies adopting it in future than was the case prior to the Games (Transport for London, 2012b; Freight Transport Association, 2013). To progress this TfL is setting up the 'London Out-of-Hours Consortium', consisting of key boroughs, retailers, and trade associations to carry out a review of re-timing activity; initiating a long-term demonstration trial for re-timing deliveries; and developing guidance for boroughs and operators on retiming deliveries including how to go about amending existing operating (Transport for London, 2013b). The Mayor has indicated the potential to further encourage the uptake of delivery and servicing planning including greater use of load consolidation in freight transport operations serving both new and existing developments in London" (Mayor of London, 2012).

Other aspects of the Games legacy for freight transport include: the electronic provision of traffic information by TfL to the freight industry (which the industry is keen to see continue), and the further development of tools such as the Freight Journey Planner, which was made freely available by TfL to help companies and drivers with vehicle routeing and to find a legal loading space. TfL had already invested in the Freight Journey Planner but the Games gave the project an impetus to make it available sooner than originally planned (Transport for London, 2013b).

A close working relationship developed prior to and during the Games between public sector bodies (especially TfL and the London boroughs) and the freight transport industry including companies and trade associations. TfL and the freight industry have expressed a desire to continue this level of engagement and collaboration. This will include maintaining and strengthening the London Freight Forum that was established, and to work together to build on innovative and flexible freight practices employed during the Games (Transport for London, 2012b; Freight Transport Association, 2012; Transport for London, 2013b). Other city authorities and public bodies in the rest of the UK and elsewhere may also decide to follow the example provided by fostering closer working relationships with industry to address freight transport issues, and to develop approaches and solutions promoted and used during the Games. Some companies also reported that they hoped to continue the closer working relationships that they had developed during the Games with other commercial partners in their supply chains.

In general, the publicity provided by the media to freight transport in the run up to and during the Games has also helped to increase public awareness of the industry. That freight

transport operations managed to continue to function reliably during the Games resulting in goods and services continuing to be available as and when required by businesses and individuals has meant that this media coverage and attention has been positive.

Conclusions

Prior to the London Olympic and Paralympic Games there had been concerns that the traffic levels combined with the road restrictions that needed to be implemented to ensure the transportation of the Games family, athletes, and goods destined for the venues took place in a rapid and reliable manner could have major negative impacts on delivery and servicing activity in London. It was thought that these impacts would primarily involve reductions in freight vehicle journey speeds and journey time reliability, and could cause significant difficulties for businesses in terms of receiving goods and services. The modelling work carried out indicated a potential increase of up to 12 per cent in vehicle hours required in some sectors (with a need for operators to either use more vehicles or operate longer shifts).

TfL produced guidance about how organisations could alter their freight and logistics systems to avoid problems during the Games. It also worked closely with freight operators and businesses receiving deliveries to put in place suitable plans in advance of the Games. This included shifting the time at which freight transport activities take place to the night when the ORN/PRN restrictions were not in force, and increasing the grouping of freight transport to reduce the necessary deliveries. TfL also made traffic information available to businesses throughout the Games period, and provided other tools such as the Freight Journey Planner.

Modelling of the proposed mitigations suggested that the expected impacts of the road restrictions on journey time and journey time reliability could be overcome if the advice provided by TfL about grouping deliveries and shifting the timing of operations was followed. The analysis indicated that these measures would help organisations to continue to receive the goods and services they required, and limit the increase in total goods vehicle operating hours necessary.

As a result of the actions taken by TfL, freight operators and other businesses, together with the reduced demand for road space as a result of TfL's effort to encourage car drivers to either avoid making journeys or use public transport, businesses continued to receive goods and services as they required during the Games period. TfL is keen to ensure that close and productive collaboration with the freight industry continues beyond the London 2012 Games. TfL is also taking steps to support industry so that the most promising of the freight transport actions taken by companies to cope during the Games, such as changing the time of delivery and collection activities to the off-peak, and consolidating goods flows will continue and grow in future, thereby reducing the negative impacts of freight transport through greater efficiency while maintaining high levels of service to customers. The importance of developing business models for these actions in which the economic benefits to companies outweigh the costs will be of central importance to their widespread adoption in the freight transport industry. If this can be achieved then the 2012 Games will have acted as a crucial catalyst to the fulfilment of more sustainable freight transport in London.

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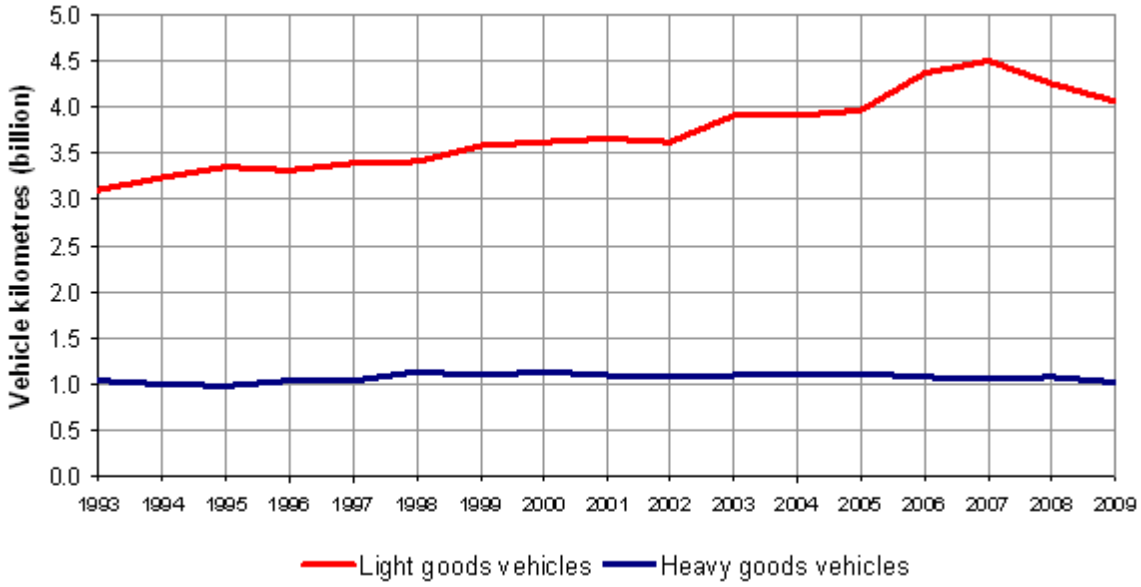
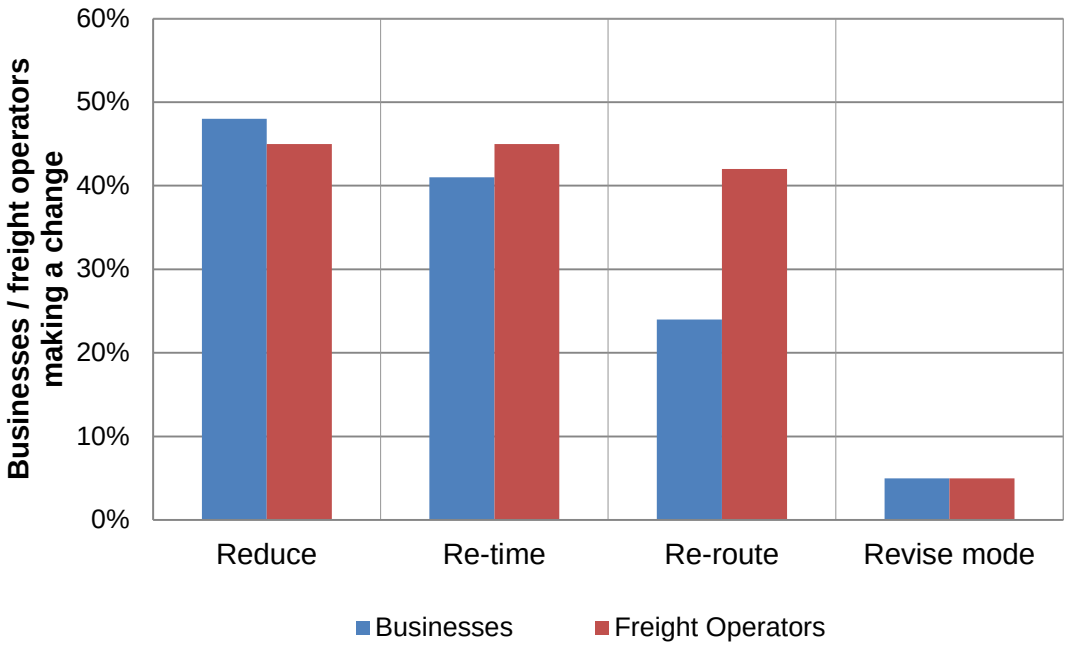
Figure 1. Vehicle kilometres performed by goods vehicles on all roads in London, 1993-2009



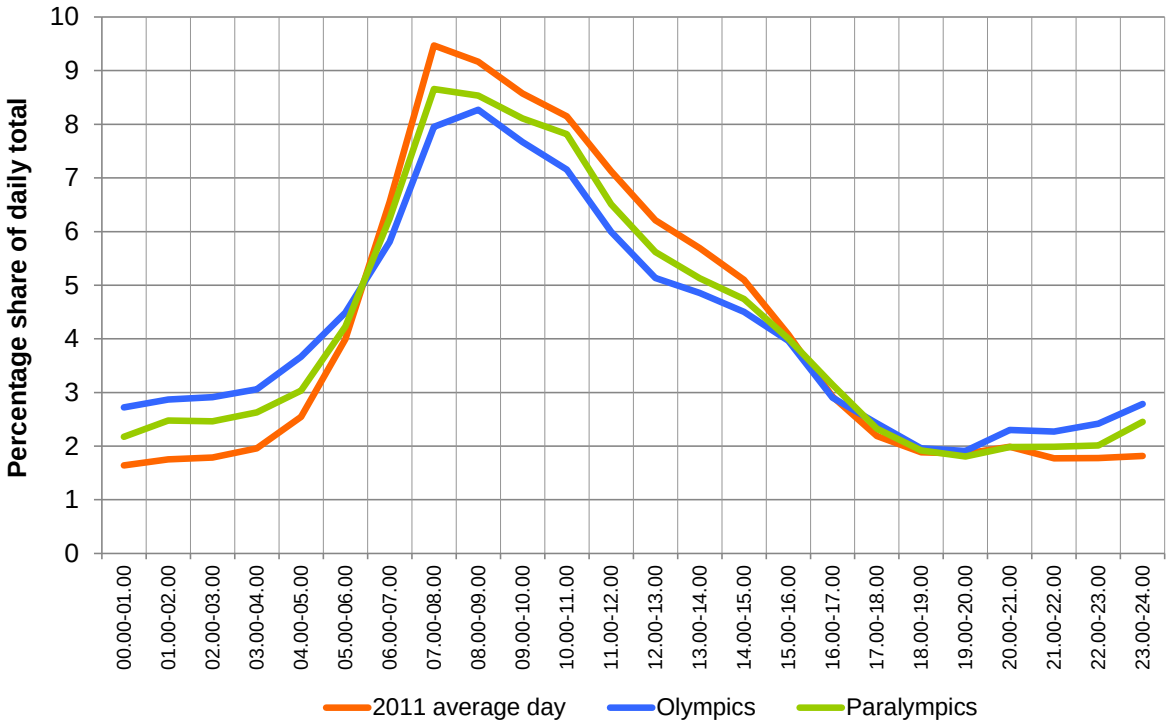
Source: TfL, 2011.

Figure 2. Proportion of businesses and freight operators who said that they made a change against each of the 4 Rs



Note: Based on 1000 freight operators, and 1002 businesses.
Source: Transport for London, 2012b.

Figure 3. HGVs entering and leaving the Central London Congestion Charging Zone



Note: Each line sums to 100 per cent = 100% of daily traffic.
Source: Transport for London, 2012b.