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Road freight transport in London

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Abstract

This paper examines the development of road freight transport operations in London from medieval times to the present. Until the twentieth century road transport was the dominant mode within London but was less important for goods moved between the rest of the country and the capital. However, since the mid-twentieth century road transport has also dominated goods movements to and from London, mainly through technological developments in goods vehicle speed and size. Regulations governing road freight operations were introduced in the City of London from the thirteenth century onwards. Since the introduction of a Mayor of London in 2000 there has been a renewed interest in the implementation of road freight transport measures at a London level.

Keywords: freight, goods, transport, road.

Introduction

Road has become the dominant mode for freight transport movements to, from and within London. This paper examines the history and development of road freight transport operations in London from medieval times to the present day. Urban freight surveys and other road traffic surveys are used to provide quantified insight into road freight transport in London and the effects of changes in land use on freight transport operations. An analysis of the performance of freight transport services over the centuries is included. The interventions by policy makers to improve the safety, efficiency and sustainability of road freight in London over recent decades are also discussed.

A history of London road freight transport operations

Road freight transport to and from London

Land transport was the earliest form of transport used extensively for freight transport. By medieval times road transport was regularly used by the king and his court (who used carts and waggons), other landowners who travelled between their estates (including monastic orders), and merchants who traded in towns and fairs around the country.¹ Gerhold has noted that a London road freight carrier is first recorded in 1398 at Oxford.² London is likely to have developed an extensive carrying network prior to other cities due to cloth exports taking place via London in the later fourteenth century, its central role in internal trade from the mid-fifteenth century, together with its political role from the late fifteenth century.³ By 1637 there was an extensive carrier network centred on London (which comprised 200 London carrying companies), but exactly how long prior to this such an extensive network had been in place is unclear.⁴ Common types of road freight operations to and from London during this period included: light, high-value goods (for these goods shippers chose road because of its speed, flexibility and reliability), and heavy, low-value goods (road was selected for these either because of the absence of suitable water routes or because the distance involved was relatively short and therefore made sense to use road to minimise distance and avoid the need for transshipment).⁵

Prior to the sixteenth century oxen and horses were used for road freight transport, but from about 1500 oxen had largely disappeared from road freight transport, and were only to be found working the land. Either draught horses with carts and waggons or packhorses carrying goods around their body were used. The packhorse was best suited to faster, long distance transport of lighter loads and transport in difficult conditions, whereas draught horses and carts were better suited to short distance heavy haulage. In terms of pulling power, the draught horse could pull a greater load than a packhorse could carry. The draught horse could pull approximately six hundredweight whereas a packhorse could only carry approximately two hundredweight.⁶ The use of draught horse and cart was most common in the period up to the early seventeenth century both for road and farm transport.⁷

Although cart operations and, later, waggon operations were generally far more widely used than packhorses in England, the latter were heavily used for services to and from London. In the late 1600s the number of packhorse services was almost equal to the number of waggon services operated by London carriers. This is probably due to the higher speed of packhorses being of greater use to London-bound operators with long-distance movements than operators elsewhere.⁸ By the early eighteenth century the waggon was being used by a growing proportion of freight operators in preference to the packhorse. The packhorse vanished from road freight activity in most areas including London by the latter part of the eighteenth century, and seem to have stopped being used by local carriers except in hilly areas by the 1830s.⁹ The factors leading to the decline of the packhorse included innovations in the breeding of waggon horses that could pull more weight, the introduction of 'flying waggon' services from the first half of the 18th century, and the improvement in road surfaces and road widening programmes resulting from the establishment of turnpike trusts between 1696 and 1840.¹⁰

Even during the canal boom of the late eighteenth and early nineteenth centuries the level of road traffic continued to increase, as reflected by the growing number of road freight services offered to and from London.¹¹ Productivity improvements in road freight transport continued throughout the period from 1740 onwards, and as canal traffic increased, road became increasingly specialised in offering the rapid distribution of high-value products with low bulk density. However, much freight moving to and from London over longer-distance services did shift from road to rail from the mid-nineteenth century and many independent road freight companies either had to work closely with railway companies performing transport within the urban area or went out of business.¹²

Up until the 1840s most of the goods entering and leaving the capital by road were transhipped at London inns. The inn had emerged centuries earlier as the ideal site at which

goods could be stored and transferred between long-distance and local collection and delivery. Many of these inns had existed in site or name since the middle ages.¹³ In 1715 London, Southwark and metropolitan Middlesex contained approximately 150-200 transport-related inns.¹⁴ In some cases urban innkeepers took responsibility for storing and supervising the flow of goods to market that had been delivered to their inns by carriers – through the use of carting and portering services.¹⁵ This relationship between inns and carriers continued until at least the 1840s when the growth of the railways began to affect both long-distance carrying and coaching services and as a result the inns. From the late 18th century onwards large carriers such as Pickfords and Russell took over the London inns that they used and turned these into their warehouses and depots.¹⁶ This trend towards road freight operators establishing their own warehouse facilities has continued to the present day.

Steam power was applied to road goods movement from about the 1860s onwards. Electric goods vehicles were also introduced from the 1880s but proved less successful. From the early 1900s petrol-powered goods vehicles began to appear on British roads. Initially most of these were relatively light goods vehicles (up to 2 tons load). Horses and waggons also continued to be widely used for distribution until the mid-1920s, after which time their use especially outside urban areas began to decline.¹⁷

During the 1910s and 1920s goods vehicles were only capable of covering relatively short distances due to their limited speed. This resulted in them mostly being used for local collection and delivery work, including working in conjunction with trunk-hauled rail freight. However towards the end of the period the speed capabilities of goods vehicles increased, as did speed limits as road improvements and major road building took place. As a result goods vehicles were able to travel far greater distances per day and this allowed them to diversify into additional work other than local services. This permitted them to compete more directly for traffic carried medium distances by rail. The rail strike of 1919 and the effects of

the General Strike of 1926 also helped to demonstrate the potential of road freight to users and the general public.¹⁸

By the 1920s a combination of technology improvements resulting in faster vehicles that could carry greater loads together with increases in speed limits allowed goods vehicles to travel ever further per working day. This allowed goods vehicles to perform longer-distance services to and from London and begin to directly challenge rail freight flows. For instance, Sainsbury which had previously had to crate up its goods for more remote branches and send them by rail in conjunction with road transport at either end could switch to using their own fleet of goods vehicles and avoid this unnecessary work.¹⁹ Another example is that of John Jempson a road freight operator based in Rye. He began offering local services in 1924 but soon began transporting local fruit and vegetables to London markets 60 miles away. He would collect flour, fertiliser and cattle food from the London docks for his return journey to Rye. His service was quicker, more reliable and cheaper than the alternative rail service with no need for transshipment.²⁰

This process of goods vehicles being able to travel further per day as technology improvements allowed greater speed, and being able to carry more as heavier, larger vehicles became available continued after the Second World War.²¹ As a result the goods vehicle fleet continued to expand rapidly, and an ever-greater share of freight traffic was won from other modes. The development of the motorway network from the 1960s and increases in the national speed limit helped to continue this process of an ever increasing catchment area that vehicles could serve. Other technological developments including unitisation (in pallets, roll cages, containers etc.), mechanical handling devices such as fork-lift and pallet trucks, and vehicle tail-lifts greatly reduced vehicle loading and unloading time.²² While vehicle body design also improved load access and securing, such as built-in straps, has eliminated much of the need for the sheeting and roping of loads.²³ The use of computing for vehicle routing and scheduling together with communications improvements including

mobile phones also greatly improved the efficiency and versatility of road freight operations. The distribution system in many supply chains has therefore now been redesigned around the use of road freight transport, with major growth in warehousing facilities located close to the motorway network.

Road freight transport within London

Ever since London became a settlement there has been a need for the internal movements of goods. From medieval times this included producers based in an urban area getting their goods to the local market, transport from the market to home for urban dwellers, transport between different stages of production within an urban area, and transport from non-road terminals to the ultimate urban destination (e.g. ports, canal wharves, and railheads), and mail and small parcel services. Road has been the main transport mode for internal freight movements within urban areas from earliest times to present. This is due to it being the only mode that can provide door-to-door connectivity to all addresses.

There was traditionally a distinction between movements that took place within the City of London and movements elsewhere in London. Movements in the City were regulated by the Mayor and Alderman and meant that from the sixteenth century only those who were officially licensed to provide freight transport services to others were legally allowed to do so. Meanwhile, freight transport operations outside the City were not restricted or regulated in the same way, other than by national regulations, until the twentieth century, when local authorities were given such powers.

Until the end of the nineteenth century these transport services were provided by freight operators using animal and cart (referred to as carriers, carters and carmen) and by porters (carrying goods on-foot). Some producers, craftsmen and middlemen operated their own road freight transport vehicles (i.e. own account operations) from early times. In addition,

street sellers (costermongers, chapmen and pedlars) roamed London on-foot with their wares.

Porters

Prior to the nineteenth century much freight transport was conveyed on foot without the use of any mechanical device. This had been the most common form of freight transport within the City and Port of London from early times. Those responsible for moving goods on foot were referred to as 'porters'. Goods were either carried on the back or head or with a sling by individual porters, or suspended from bars or poles on the shoulders of two porters.²⁴ It could also involve using baskets to receive goods from boats laden with coal or other commodities.²⁵

The City of London's porters were involved in moving goods between two locations (such as between a ship and a store, or between a store and a customer), or in loading and unloading transport vessels including boats and ships. Later, porters working in the docks came to be known as 'stevedores' and 'dockworkers'. Even though carts existed, they were not used to bring goods to or collect goods from the waterside until the eighteenth century; instead this transport was all performed by porters. The reason for the absence of carts at quays and wharves is probably due to several factors including: i) the fact that portering existed long before carts had become widely available, ii) the limited space available on the wharf, and iii) the narrow streets, alleys and courtyards to which goods had to be moved.²⁶

Porters also carried post and letters within the City on behalf of Londoners and moved goods between London's markets. Goods and produce delivered into London by cart or waggon would all be unloaded at one location (often an inn or market). However many vehicles carried mixed loads that were either destined for several receivers at a market or even for several different addresses/markets. The final delivery of these goods would therefore either

take place by cart or porter depending on the location and quantity of goods to be transported.

Portering was a low-class occupation, generally carried out by the young and poor. Until 1579 porters were unlicensed but from this date they were made members of City Companies. This occurred due to pressure from porters who were threatened by the arrival in London of many poor people who competed for carrying work. However, the porters were not made into freemen, instead they were organised into 'fellowships' which were headed by a City Alderman. These fellowships were formed by the City Corporation in order to control porters, their wages and their number.²⁷ London was a major source of employment of porters, with Mayhew reporting that in 1841 the census showed that approximately half of all porters in the country were working in London.²⁸ The physical infrastructure associated with portering services included: i) the stands at which street porters waited for work (there were about 100 of these stands in the City in the 1770s,²⁹ and ii) pitching places at which porters could rest while carrying goods. Each of these pitching places consisted of a wooden block onto which loads could be lowered.³⁰ Not all portering work within the City of London was carried out by licensed porters; some extremely heavy and unattractive tasks such as shovelling and unloading coals from ships were carried out by labourers who were not members of City Companies.³¹

The City authorities had no jurisdiction over portering services in the rest of London outside the city walls and the Port of London. By the late eighteenth century, companies based in the City had begun to establish wharf facilities and warehouses outside (to the south, east and west), and so escaped the need to use City porters.³² By the early nineteenth century dock companies were constructing newer, larger, more modern facilities outside the City. The West India Dock Company refused to use any City porters and employed all of its labour needs directly.³³ Other dock companies began to follow suit. During the early nineteenth century the street porters also found their rights in the City coming under attack from

innholders, who were increasingly acting as agents for producers supplying food to London. These suppliers delivered their wares to the inns by cart and wagon, and then innkeepers organised the transport to market and the sale of the goods on their behalf. Traditionally, the innkeepers had used porters to transport these goods to the markets, but the innkeepers began using their own carts and employees for this transport.³⁴

Slowly City porters' privileges were eroded in all aspects of their work in the Port, at the new docks, and at the markets during the nineteenth century. This was brought about partly by companies wanting to either make use of casual labour (such as in the docks), or by directly employing their own staff (such as by innkeepers and in warehouses), as well as changes in supply chain arrangements that meant as far smaller proportion of product was passing through traditional markets over time. However, by far the most important factor in the demise of the porter (both those in the City and elsewhere in London) was the rise of new, mechanised handling equipment that greatly reduced the time involved in loading and unloading goods from vessels and vehicles, as well in moving goods to and within warehouses. The coming of the railways to London signalled the end of the City of London porter as the railway termini were all situated outside the City and therefore beyond its jurisdiction. The railway companies employed their own porters directly. However, although a few of these operated on-foot within the stations to help passengers with luggage to and from trains, the vast majority of those involved in rail freight that required local collection and delivery used horses and carts. The only place in London that the existence of porters continues is at the Corporation of London's Smithfield, Spitalfields and New Covent Garden wholesale food markets.³⁵ The byelaws governing the Corporation's Billingsgate fish market are in the process of being revoked by the Corporation bringing to an end the licensing of porters.³⁶

Carriers, carters and carmen

Two types of cart were used in the City of London up to the sixteenth century: i) cars or short carts which were twelve feet long and three feet wide, and ii) long carts which were fourteen feet long and four feet wide. Short carts were most common in the City as they could negotiate narrow roads and the steep hills from the river better, while long carts were used for heavier loads and longer distances.³⁷ From the sixteenth century, those offering their cart carrying services for hire in the City were granted 'car-rooms' or licences by the Lord Mayor and Aldermen which allowed them to provide this service. In 1512, 40 carts were officially licensed to ply for trade in the City.³⁸

The City authorities made carriers responsible for removing human and other waste from the streets. Inhabitants dumped their waste in the streets, and ward officials organised the raking of this into piles, which were then removed outside the City by cart.³⁹ In 1517 the Fraternity of Saint Katharine the Virgin and Martyr of Carters was founded. The founders entered into a contract with the City authorities to meet the purveyance requirements of the monarch, to clean waste, dung and filth from the streets, and to carry goods including fuel to and from wharves and all other locations within the City. They were given the sole right to common carriage for goods movement by cart within the City. However other freemen of the City were still allowed to carry their own goods within the City by their cart.⁴⁰ By 1580 as a result of the growth in trade and the demand for carrying services, 400 carts were licensed in the City, a ten-fold growth over 70 years.⁴¹ A dispute between carmen and woodmongers over the licensing and operations of carts continued for two centuries from the 1540s.⁴² In 1586 the control of road freight transport in the City was passed to the Governor's of Christ's Hospital; carmen were finally allowed to establish their own fellowship in 1668.⁴³

As trade in the City grew from the early seventeenth century so too did the demand for road freight services within the City. However the restrictions of the number of licences available for common carrying services prevented a response in supply. Additionally those holding licences could sell, hire or bequeath these to others. These licences therefore had a tradable

value and this value increased rapidly as a result. To prevent speculators buying up and renting out licences rules were introduced to prevent a carrier holding more than one licence in their first four years of their freedom, and only a maximum of three thereafter. In addition, the hiring out of licences was limited to wharfingers for the carriage of their fuel, and the right to hold licences in perpetuity ceased. Over time the number of vehicles that could be held on a licence was also relaxed.⁴⁴

By the second half of the nineteenth century the privileges of the City carriers based on the licensing system had fallen into abeyance. The demand for City carriers had diminished, first as a result of the opening of the West India Dock which lay outside the City, and then by other docks. However, road freight movements within the rest of London increased substantially as the population and the level of trade continued to grow. Despite the rise in importance of other modes of freight transport (canals, coastal shipping and rail freight) for long distance movements, all collection and delivery work within the capital was conducted by road. The employment of carmen, carters, carriers and waggoners in London increased approximately four-fold from 15,000 in 1861 to 61,000 by 1901.⁴⁵ The efficiency of road freight transport operations in London was improved during the second half of the nineteenth century as a result of the paving of London streets. This resulted in each horse being able to pull a greater load, and also reduced mud, dust, noise and accident levels.⁴⁶

Emerging retail chains such as Liptons, and Home and Colonial contracted carriers to transport their goods to their stores from railheads. These services were the start of dedicated contract distribution with the use of vehicles liveried with the customer's name. As retail industry grew and its expanding population spread into new suburbs this generated substantial demand for urban freight services to deliver shop purchases from shop or warehouse to home, as well as meeting the needs of suburban retailers and other businesses. Pickfords, for instance, began opening depots in suburban centres in London from the 1880s on (such as Brentford, Croydon, Edmonton, Kingston, and Walthamstow).

Each of these local depots served a delivery and collection catchments and were linked together by a couple of central depots. Overnight, goods were transported from the suburban depots and railway depots to these central depots where they were sorted and redespached to the appropriate local depot for delivery the following morning.⁴⁷

From the early twentieth century horses began to be replaced by motorised goods vehicles. For example, in 1900 Carter Paterson operated approximately 1,250 horse vans and 3,000 horses. By 1904 they had purchased four steam waggons to serve their London depots, each of which travelled, on average, 48 miles per day and carried 3 tons of goods on the platform and 2 tons on the trailer. In 1906 they purchased 40 petrol vans with a 15-20 cwt capacity.⁴⁸ In 1905 Shoolbreds of London found in a trial that vans could average 41 miles per day with an average speed on 6 miles per hour. This level of activity was in excess of what a horse could achieve and helped the company to extend the geographical area over which they could do business. By 1908 Shoolbreds were using vans to supply customers in Abingdon with furniture in a single day, a distance on 60 miles from London.⁴⁹ Maples and Co Ltd found that the introduction of a new suburban depot network in London from 1890 allowed it expand its distribution catchment by horse and cart from 15 to 30 miles by 1899. By 1908 it was using motorised vans and these had allowed it to serve a customer base up to 55 miles from its central London store (Gibson, 2001). The gradual switch from horses to motor vehicles that could cover a far greater distance per day allowed companies to vastly reduce the number of local collection and delivery depots they operated across London.

Interventions by policy makers in London

This section addresses the policy interventions applied to road freight transport in London. Regulations governing road freight operations were introduced far earlier in the City of London than nationally. This was due to the level of freight activity in London from early times and the associated congestion, safety and road wear problems that it caused. The first

regulation which was concerned with the prevention of the use of iron shod wheels in the City was introduced in 1277. As previously explained by the sixteenth century porters and those offering cart carrying services for hire in the City were licensed by the Lord Mayor and Aldermen. By the early sixteenth century the City authorities also made carriers responsible for removing human and other waste from the City.⁵⁰

Other regulations introduced in the City of London in the late sixteenth century included the apprenticeship of carmen's servants, restrictions, the prevention of carriers leaving their vehicles in the street overnight, the use of more than one horse except when carrying loaded vehicles uphill, and preventing them from travelling at speeds greater than 'usual'.⁵¹ Fines were also introduced for carriers who did not lead their horses by the collar and who did not take special care in relation to the aged and children. These regulations also addressed traffic congestion, threatening carriers with imprisonment and the loss of their vehicles for one month for blocking streets with their empty, stationary vehicles. 'Stands' were introduced to prevent such congestion; these were fixed locations where empty vehicles and their drivers waited in a queue with other licensed carriers for customers (in the same way as a modern taxi rank) – each stand provided space for a specified number of vehicles (between 3 and 12) and were located close to the markets as this was where most road freight took place.⁵² These stands led to many problems and disagreements between carriers and their customers and also between carriers. This stemmed from the practice of 'turn-keeping' among carriers when on the stand – this involved refusing a light load and waiting instead for a heavier, more profitable one. Regulations were also put in place in an attempt to increase the share of goods transport leaving the City of London that London carriers obtained by preventing provincial carriers from transporting goods out of the City other than at times of the Great Fairs) unless they were from towns that produced regular flows to and from the capital. To prevent abuse of this regulation, London carriers were prohibited from transferring their loads to provincial carriers once they were outside the City.⁵³

Further traffic regulations were put in place in the City in 1617 to address new problems – these included the introduction of one-way streets for the first time; stands were added near to the riverside quays and wharves as shipping traffic was increasing rapidly as trade grew; carriers were banned from feeding their horses in the street; regulations also prevented carriers from riding on their vehicles and allowing their horses to travel unled, and from getting within a cart-length of any other vehicle. Load weight and size regulations also existed. In the seventeenth century only loads of up to one ton were permitted, or in the case of liquids one butt, one pipe, three hogsheads, or two puncheons. In addition boys under 18 years of age were not allowed to be in charge of vehicles.

Rules and regulations were enforced by street keepers appointed by Christ's Hospital. Originally fines were levied by Christ's Hospital, and later by the Hospital in conjunction with the Fellowship of Carmen. The street keeper who informed received 25 per cent of the fine, and the other two bodies split the remainder equally.⁵⁴ Some carriers were fined for riding on their carts and for feeding horses in the street, while some unlicensed carriers were also prosecuted but the likelihood is that enforcement was relatively ineffective and that many unlicensed carriers undertook operations in the City.⁵⁵

In 1757 Justices of the Peace of London were given the power to set carrier rates in London and Westminster up to a distance of three miles from the city. They were also given powers to make rules concerning vehicles and drivers in London. This resulted in Carmen having to pay an annual licence fee, the allowance of slightly longer carts, load limits raised from one ton to 25 hundredweight, and the age limit for drivers reduced from 18 to 16 years. Any fines imposed were now to be shared equally between the street keeper and the poor of the parish in which the violation took place.⁵⁶

From the latter part of the nineteenth century until the late twentieth century most new road freight regulations (such as the introduction of road tax, vehicle licensing, operator licensing, driver licensing, and vehicle construction and use regulations) were implemented nationally rather than at the London level. However London authorities were able to implement some local policy measures such as speed limits on local roads, where on-street loading and unloading was permitted, and weight restrictions on particular roads, bridges or routes.

The London Lorry Control Scheme was introduced across the whole of London in 1986 with the aim of reducing noise disturbance by heavy lorries at nights and weekends especially in residential areas by reducing through traffic but in a way that allows London's economic activity to continue.⁵⁷

Since the introduction of a Mayor of London in 2000 there has been a renewed interest in the implementation of road freight transport measures at a London level. This was assisted by the formation of a freight unit in Transport for London, an executive body of the Mayor. The London Congestion Charging Scheme was introduced in 2003,⁵⁸ and a Low Emission Zone for lorries, buses and coaches was implemented in 2008.⁵⁹ A Freight Operator Recognition (FORS) Scheme was launched in 2006, together with Delivery and Servicing Plans (DSPs) and Construction Logistics Plans (CLPs) in 2008.⁶⁰ A three-month trial of night delivery for a Sainsbury supermarket using noise reduction equipment and staff training took place in Wandsworth in 2008 with the Noise Abatement Society, Wandsworth Council, and the Freight Transport Association.⁶¹ A six-month pilot of a construction consolidation centre in Bermondsey was also carried out by Transport for London in conjunction with the construction industry.⁶²

Road freight transport in London in the modern era

Efforts to collect data about road freight transport activities in London only began from the 1970s onwards and even then this only consisted of one-off surveys of selected high streets and other locations. It has only become possible relatively recently to disaggregate data estimating the total quantity of road freight activity and operational performance of heavy goods vehicles (HGVs – i.e. goods vehicles with a gross weight over 3.5 tonnes) on journeys to, from and within London from data collected as part of the national Continuing Survey of Road Goods Transport conducted by the Department of Transport.

This section uses available data to provide insight into the scale and performance of road freight transport in London. This includes i) the level of employment in freight transport, ii) the relative importance of road freight in comparison with other transport modes, iii) detailed insight into the freight transported to, from and within London and the transport intensity and efficiency of these operations, iv) goods vehicle activity on London streets as a proportion of all road traffic, and v) the operations of road freight vehicles in high streets within London.

The economic success of London is dependent on the efficient movement of goods and services as well as people. Freight transport comprises an important part of London's economy. In 2008, approximately 183,000 (5 per cent of the London workforce) were directly employed in organisations whose main activity involves freight transport and logistics. An additional 1.5 per cent of the London workforce was employed in freight and logistics activities in other sectors in 2008. Therefore a total of 6.5 per cent of London's workforce was employed in freight and logistics activities (approximately 240,000 people).⁶³

Road is by far the dominant mode for goods transport in London in terms of the weight of goods lifted; it was responsible for 89 per cent of all goods lifted on journeys to, from and within London in 2008. The next most important mode is Port of London traffic on the Thames within London (6 per cent of goods lifted), followed by rail (5 per cent of goods lifted).⁶⁴

Approximately 142 million tonnes of road freight, carried on journeys by UK-registered heavy goods vehicles (HGVs – i.e. goods vehicles with a gross weight over 3.5 tonnes) had its origin and/or destination in London in 2008. The road freight carried on journeys to, from and within London represented approximately 8 per cent of the total freight lifted in Britain by weight in 2008. Construction and building materials including wood, timber, sand, gravel, cement, and iron and steel products accounted for approximately 35 per cent of goods lifted by weight on HGV journeys to, from and within London in 2008. Food and drink accounted for approximately 20 per cent of goods lifted, chemicals and petroleum accounted for 5 per cent. All other miscellaneous goods including textiles and clothing, vehicle and machinery, containers, parcels, household waste accounted for the remaining 40 per cent of goods lifted by HGVs.⁶⁵

Several factors have altered the composition of industrial and commercial land use in London since the 1960s and thereby affected road freight transport operations. Rising land values and high labour costs in major cities in developed countries London have led to producers seeking to reduce total production costs by relocating factories to countries with lower labour rates and land prices.⁶⁶ This is borne out by data that shows in the decade between 1998 and 2008 factory floorspace in London fell by 37 per cent (Calculated from Valuation Office Agency data in ONS, 2010). Over this same period the rise in the post-industrial service sector resulted in an 18 per cent increase in office floorspace and 5 per cent increase in retail floorspace in London.⁶⁷ The increase in non-industrial activities in London has led to London being a major net importer of freight by HGV, and the extent of this net importation appears to be increasing over the last 25 years. Between 1984 and 1998, on average, 29 per cent more freight was lifted on journeys to London than from London. Between 1999 and 2008 this rose to 42 per cent.⁶⁸

At the same time producers and suppliers have sought to reduce total logistics costs by centralising their stockholding of goods in fewer, but larger warehouses, often located on the edge of or outside of urban areas.⁶⁹ The total warehousing floorspace in London in 2008 was 4 per cent higher than in 1998. By comparison the total warehousing floorspace in the south east and in England and Wales increased by 21 per cent and 22 per cent respectively over this period. This suggests that London has been increasingly served by warehousing located beyond its boundary in the last decade. Of the freight lifted on journeys by HGV in London and delivered elsewhere in the UK in 2008, 73 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 London from elsewhere in the UK, 73 per cent by weight was loaded in these same two regions.⁷⁰

Data also indicates increasing suburbanisation of warehousing floorspace within London. Warehousing floorspace fell in all central London boroughs between 1998 and 2008 (by 82 per cent in the City of London, 51 per cent in Westminster, 37 per cent in Camden, and 22 per cent in Kensington and Chelsea), and also fell in many other inner London boroughs (by 42 per cent in Hackney, 31 per cent in Islington, and 24 per cent in Southwark for instance). Meanwhile growth in warehousing floorspace was strong in many outer London boroughs over the same period (for example 49 per cent in Bexley, 34 per cent in Enfield, 26 per cent in Barking, 28 per cent in Sutton and 21 per cent in both Havering and Waltham Forest).⁷¹

Technological developments in road freight transport have helped to facilitate these changes in land use by reducing the transportation costs and time involved in distributing freight (through the use of faster and larger goods vehicles) and thereby allowing the distance over which goods are transported by road goods vehicles to and from London to increase without major increases in distribution costs or delays in supply.⁷²

The vehicle carrying capacity of HGVs on journeys to, from and within London in 2008 these were 19.2, 18.5, and 9.1 tonnes respectively. This reflects the lower carrying capacity of HGVs used on journeys within London given the existing traffic levels and road capacity constraints.⁷³

Comparisons of one-off urban freight surveys of particular locations in London help to provide insight into changes in road freight transport operations between the 1970s and today. A review of 22 such surveys was therefore carried out, five from the 1970s and 17 from the last decade (1999 to 2009).⁷⁴ The results indicate several relatively unchanged features as well as several developments in goods delivery and collection operations in London.

In the 1970s studies and in studies conducted over the last decade the morning (06.00-12.00 hours) is by far the busiest period for goods deliveries to London establishments. In the five 1970s studies reviewed morning deliveries accounted for 53-67 per cent of all deliveries; deliveries after 14:00 made up a relatively small proportion of the total in each study. By comparison, the recent studies found that 40-60 per cent of all deliveries took place exclusively during the morning, with the remainder taking place either throughout the day (which could include the morning) or in the afternoon.

The 1970s studies show that the vast majority of vehicle collections and deliveries were made on weekdays (Monday to Friday) with comparatively little activity on Saturdays. There were no Sunday deliveries at this period. This pattern has remained virtually unchanged according to the recent surveys except for 1-3 per cent of deliveries now taking place on Sundays. Fewer trips were made on Wednesdays and Thursdays than on other weekdays in the 1970s surveys, typically due to half-closing days, which is no longer common practice.

The Hammersmith and Wembley studies of the 1970s asked drivers about the origins of their journeys. These varied depending on product type, however, overall approximately three-quarters of journeys to Hammersmith and Wembley originated in London boroughs, with only approximately 10 per cent of trips originating more than 50 miles away. In studies of the last 10 years a lower proportion of journeys originated from as near to the establishments visited as in the 1970s studies (in a study in Bromley study 47 per cent of delivery vehicles had been despatched from either London or Kent depots, with 25 per cent of vehicles travelling from depots at least 50 miles away; and in a Bexleyheath study 35 per cent of delivery vehicles had been despatched from either London or Kent depots with at least 50 per cent of vehicles coming from more than 50 miles away). This comparison suggests that over the period since the 1970s the distance over which the majority of vehicles are travelling to make deliveries to London establishments have increased substantially. As discussed earlier, many companies have centralised stockholding and established national or regional distribution centre networks over this period, resulting in substantial increases in average journey length.

On average, establishments in the Hammersmith and Wembley studies of the 1970s received goods from vehicles operated by 12-13 different companies. This is higher than in the majority of recent studies for which comparable data is available. The results of these two 1970s studies also indicate that manufacturers and wholesalers were the main source of goods despatched to establishments in Hammersmith, while in Wembley, companies' own warehouses were the main source of goods. These results reflect the lack of use of third party distribution companies. This is very different from the distribution systems currently used on London's high streets with third party logistics operators playing a far greater role in deliveries to establishments on behalf of manufacturers and also multiple retailers, and a lesser importance of wholesalers as the number of independent retailers has diminished.

The 1970s studies also indicate that deliveries by hand were by far the most common method for moving goods from the vehicle to the establishment, accounting for approximately 70-90 per cent of deliveries in the five studies that provided such data. There is evidence of the wide range of handling equipment used in the recent London studies, such as roll cages, wheeled rails, hand trucks and pallet trucks. The introduction of these devices has helped to reduce loading/unloading times and to reduce the risk of injury to the driver.

Comparing the performance of road freight transport over the centuries

The vehicle miles travelled per tonne lifted is a measure of the transport intensity of freight activity. For HGV journeys to, from and within London in 2008 this was 8, 12 and 4 miles respectively, with an average of 7 miles for all London HGV journeys. The transport intensity of HGV journeys within London was the lowest due to the relatively short distance over which goods are moved on these journeys.⁷⁵ HGV journeys from London had a far greater transport intensity than those to London in 2008 due to the trade imbalances that resulted in lower lading factors and more empty running on journeys from London.

It is difficult to compare the performance of road freight transport operations in the modern era with those prior to the twentieth century due to lack of data in earlier periods. However, data compiled from directories of the services operated from London by carriers for the period 1690 to 1838 in terms of the quantity of goods lifted, vehicle miles travelled and tonne-miles performed⁷⁶ can be used to provide an indicative comparison of the transport intensity of these road freight journeys from London with those operated today. The results suggest that approximately 105 miles were travelled on average per tonne lifted on journeys leaving London in 1690, and that this fell to approximately 50 miles travelled per tonne lifted in the 1830s as a result of greater carrying capacities due to larger wagons and less use of packhorses. As explained above, in 2008 only 12 miles were travelled on average per tonne lifted on journeys from London. The distance travelled per tonne lifted is an important

determinant of the traffic, social and environmental impacts of road freight transport. However, differences in the vehicle technology used (in this case horses compared to petroleum-fuelled vehicles) are also important in terms of fossil fuel consumption and pollutant emissions making direct comparisons of the impacts of road freight transport activity difficult.

Conclusions

The total quantity of goods transported to, from and within London has increased as the capital's population has grown, the level of trade has increased, and the average standard of living has improved resulting in greater consumption levels per head. Road freight has played an important role in the transportation of these goods over many centuries. Until the twentieth century road transport (by horse, vehicle and on-foot) had a dominant share of freight transport within London but was less importance in terms of goods moved to and from the capital from the rest of the country. However, during the twentieth century road transport has come to also dominate the movement of goods to and from London, due to it attaining a level of productivity and cost effectiveness that is superior to other modes. The transport of freight on-foot within London which had been an important source of employment for the working classes went into decline during the nineteenth century and was replaced by horse and cart services, which were superseded by motorised vehicles in the twentieth century.

Deindustrialisation, rising urban land prices, the emergence of the post-industrial service sector, and efforts by companies to reduce inventory costs through centralisation of stockholding in fewer, larger warehouses have led to major changes in the demand for and geography of road freight transport operations serving London in recent decades. The net importation of goods into London by road freight transport is rising, and the remaining warehousing is becoming increasingly suburbanised. Technological developments in road freight transport in terms of vehicle speeds and carrying capacities, together with improved

road surfaces and supportive regulations have helped to facilitate these processes. This has made it possible for the production of even time-sensitive and perishable goods destined for London to be located ever-further from the capital.

Despite the relative lack of data available, comparison of the performance of road freight transport operations in the modern era with those prior to the twentieth century suggests that far fewer miles are travelled today per tonne lifted on journeys from London than in the seventeenth to nineteenth centuries despite the far greater distances that many goods are now transported by road. This is due to the greater carrying capacity of today's road goods vehicles.

Comparisons of the results of road freight surveys in London since the 1970s indicate that the distance over which the majority of vehicles are travelling to make deliveries to London establishments has continued to increase significantly, that the size and weight of goods vehicles used to make deliveries in London has also continued to rise, and that there has been a substantial increase in the use of specialist third party distribution companies, with far greater use of sophisticated handling systems that help to reduce loading/unloading times and to reduce the risk of injury to the driver.

Regulations governing road freight operations were introduced in the City of London from the thirteenth century onwards. This was far earlier than in other towns and cities and nationally. The need for regulation resulted from the level of freight activity in London from early times and the associated congestion, safety and road wear problems that it caused. From the latter part of the nineteenth century until the late twentieth century most new road freight regulations, with the exception of local measures concerned with speed and weight limits and time restrictions, were implemented nationally rather than at the London level. However, since the introduction of a Mayor of London in 2000 there has been a renewed interest in the implementation of road freight transport measures at a London level. Those that have been

implemented have become national and international examples of methods by which to address negative social and environmental impacts arising from road freight transport.

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