

Worth the Weight: Making London's deliveries greener and smarter

*Nikita Quarshie, Nicolas Bosetti, Claire Harding,
Kieran Connelly and Rob Whitehead*



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About the authors

Nicolas Bosetti

Nico is a Research Manager at Centre for London. He is chiefly interested in cities, governance and regional economic development, and at Centre for London he has co-authored reports on inequality and social mobility, city planning, and London after Brexit. Nico has an MSc in Urban Policy.

Kieran Connelly

Kieran is a Research Assistant at Centre for London. Before joining the Centre in 2021, he was an election agent and strategist in local government elections. Kieran is also a volunteer tutor/mentor for children with chronic health conditions.

Claire Harding

Claire is Research Director at Centre for London. Before joining the Centre she was Head of Research at Coram Family and Childcare, where she led on the annual Childcare Surveys. She previously worked in research and development at digital mental health provider Big White Wall, and in public sector research consultancy. Her research interests include education and opportunity, wellbeing, equalities, and gender.

Nikita Quarshie

Nikita is a Researcher at Centre for London. Her research interests include gender, social and environmental justice, and care as an organising principle. Prior to joining the Centre in 2020, Nikita was a Research and Policy Intern for the OECD's Strength Through Diversity team and a Research and Project Management Intern for NETRIGHT, a network of women's rights organisations in Ghana.

Rob Whitehead

Rob is Director of Strategic Projects at Centre for London. He rejoined the Centre in 2020 after initially helping to establish the organisation in 2011 and leading on our inaugural research programme. Prior to his initial role at Centre for London, Rob worked on strategy and business planning for the London Development Agency. In 2012, he joined the United Nations International Trade Centre agency as Chief of Strategy, where he led on planning, evaluation, governance and fundraising. Rob returned to the UK in 2015 as Head of Strategy at Future Cities Catapult, part of a network of UK government-backed innovation agencies.

Foreword: Impact on Urban Health

The COVID-19 pandemic has been a stark reminder that our health is shaped by where we live, our jobs and our income – factors that are often beyond our control. Nowhere is this more evident than in our inner cities.

At Impact on Urban Health we're focused on tackling the largest environmental driver of ill health – poor air quality. Air pollution disproportionately affects the health of children, older people and those with heart and lung conditions. It also intersects with other systemic causes of ill health such as unemployment and noise pollution, and has a disproportionate effect on people who live in lower-income neighbourhoods.

The air we breathe in our city centres is a product not only of how we get around cities, but also of how we heat our buildings and obtain goods and services. In London, we've seen exciting progress in tackling emissions from diesel and petrol cars – including the expansion of the Ultra Low Emission Zone. But with changing consumer habits and the shift to online shopping, we need urgent, coordinated action to address emissions from urban freight. This report highlights how, by reimagining how we do urban deliveries, we can improve air quality and protect people's health in a way that is fair and equitable.

Kate Langford

Programme Director, Impact on Urban Health

Foreword: Prologis UK

At the start of the pandemic, as bricks and mortar stores closed their doors, internet sales as a percentage of total retail sales jumped from 18 to 37.1 per cent by January 2021, a growth rate that would have taken a decade to realise had it not been for the unprecedented national lockdown.

With online sales unlikely to drop back to pre-covid levels, cities, like London, face the challenge of balancing surging consumer demand for home deliveries with a need to improve air quality and reduce traffic noise and congestion.

The logistics sector has the ability to work with government and local authorities to solve the last mile delivery conundrum. It's also a sector that can bring much needed jobs and investment to local areas. That's why, as the UK's largest developer and owner of logistics parks, we were delighted to support Centre for London to produce this report. This important piece of research shines a light on the complex interdependencies at play when it comes to last mile delivery and proposes key recommendations for businesses, consumers and government to drive positive change.

Robin Woodbridge

Head of Leasing and Capital Deployment, Prologis UK

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Summary

Freight and deliveries enable London's economy to function, but currently rely on unsustainable modes of transport that cause significant pollution. This impacts on Londoners' quality of life, health, and our ability to reach net zero.

- Freight represents 15 per cent of total vehicle miles travelled in London, but 34 per cent of nitrogen oxide (NO_x) and 27 per cent of fine particulate matter (PM_{2.5}) emissions from road transport come from freight vehicles.
- Freight and deliveries also account for a quarter of London's total carbon emissions from transport.

London's freight and delivery challenges are much greater than those of other UK cities...

- The city's size means delivery consolidation cannot be pushed to the city's fringe, which is too far away once green belt protections are taken into account.
- There is a severe shortage of available space for logistics within the city, meaning that delivery vehicles need to drive longer distances.
- London is the most congested city in the UK, with the greatest number of lost hours due to traffic of any UK city. Congestion prevents essential traffic such as freight and deliveries from moving around efficiently, and makes driver shifts more strenuous and unpredictable.
- London is the densest city in the UK, with many competing street uses such as travel, leisure and residential.

...but London also has the most potential for sustainable deliveries:

- Higher residential densities increase the viability of smaller, greener vehicles, as well as local parcel pick-up and drop-off.

The growth in demand for deliveries means the status quo is unsustainable, so we need to shift to greener modes and make deliveries more efficient.

- The number of parcels delivered in London is expected to double by 2030 as the shift to e-commerce continues.
- Diesel and petrol van sales are booming. Nationally, diesel van registrations increased by 82 per cent in March 2021 compared to 2020, while petrol van registrations increased twofold.
- HGV electrification is not expected until the 2030s at the earliest.

Recommendations

To prioritise deliveries:

- The Mayor of London should press ahead with plans to introduce road user charging, in order to reduce congestion on London's roads and save time and money for vehicle drivers. Centre for London has been making the case for London government to introduce a road charging scheme, with charges based on vehicle class and emissions, distance travelled, the availability of replacement electric vehicles, where a journey is and whether it is deemed essential. Such a scheme could give priority to delivery and servicing vehicles.
- London Councils should allow quiet deliveries to take place during evenings and the night-time.
- London boroughs and Transport for London should embrace dynamic and digitalised kerb management, which would give delivery vehicles safer and more reliable access while minimising impacts on other road users.
- Transport for London should introduce parking charges on red routes, and prioritise the need for loading bays over car parking.
- If these recommendations prove difficult and challenging within existing regulatory powers, the national government should devolve further responsibilities to London's government to allow them to proceed.

To deliver to and from the right places:

- The Mayor of London should work with boroughs and parcel delivery companies to ensure that 90 per cent of Londoners have a universal parcel pick-up/drop-off point within 250 metres of their home by 2025.
- National government should give the Mayor of London powers to introduce an online sales tax for at-home deliveries, which could be used to encourage delivery companies to set up more pick-up/drop-off locations, and encourage consumers to use them.
- The Mayor of London and local authorities should campaign to highlight the impact of non-sustainable delivery methods, while also raising awareness and take-up of sustainable delivery options.
- Local authorities should work with communities to understand how microhubs could serve their needs and deliver positive impact, while also including communities in consultation over the right locations.
- The Mayor of London and London boroughs should ensure that space is available for logistics hubs near homes, which would allow delivery vehicles to reduce their mileage.

To deliver in the right way:

- To accelerate the shift to electric vehicles, national government should fund upgrades to power distribution networks, as well as charging facilities in private and commercial premises such as depots.

- To reduce van and lorry journeys on key London roads, national government and the Port of London Authority should invest in the redevelopment of London's piers, wharves and rail-road interchanges. Public investment in river and rail freight infrastructure should be combined with targets for the electrification of boat and train fleets to reduce pollution.

To consolidate deliveries:

- National government should give local authorities the power to require the consolidation of all commercial deliveries into designated areas, such as certain high streets. This would reduce congestion and pollution, and would improve high streets for residents and visitors.

If national government is unwilling:

- Business Improvement Districts should negotiate framework procurement contracts so that their members can use common suppliers at cheaper prices.
- Commercial landlords should require tenants to use the same suppliers for common services such as waste collection.
- Local authorities should require all large developments in opportunity areas to use a construction consolidation centre, and make this a requirement of planning permission.
- Local authorities should make delivery consolidation a requirement in planning applications for all new major developments.

Research methods

Research for this report was carried out according to a mixed-methods approach. A review of literature and policy documents on urban freight and deliveries was conducted, as well as a review of data on air pollution and carbon emission sources. We also interviewed 25 freight and logistics specialists to gather London-specific insights, including freight policy leads as well as experts from delivery companies and smart freight solutions businesses. For our Old Kent Road Deep Dive, we conducted a survey of 30 local businesses on their delivery needs and the barriers they faced to adopting greener delivery options.

The report also includes new data analysis provided by Environmental Defense Fund Europe (EDF Europe) on a sample of 7,100 trips made by goods vehicles on the Old Kent Road during the week of 9-15 September 2019,¹ as well as data modelling of local air pollution impacts.

1. The case for change



"The biggest misunderstanding in logistics is that it's cheap or low-cost. Free deliveries are a myth – these have costs."

Co-Founder, zero-emission delivery service

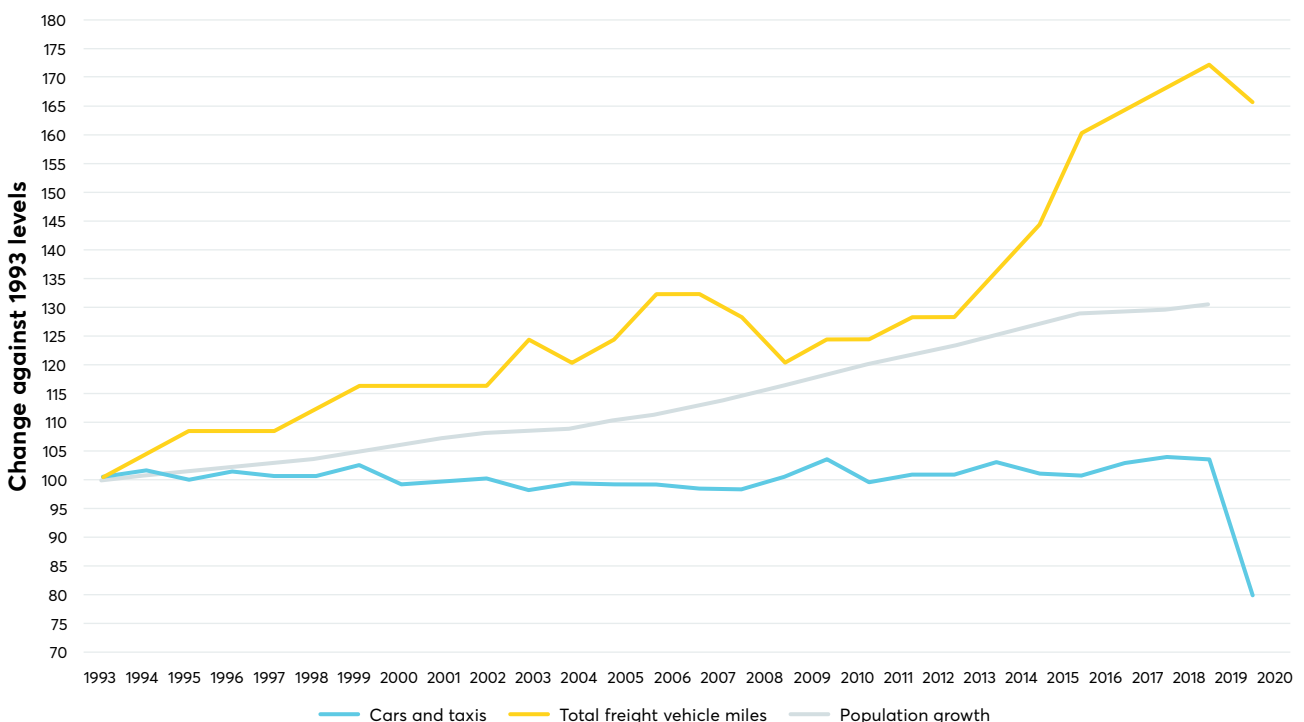
"I think net zero carbon emissions by 2030 is ambitious – but everyone is in the same boat, and where there's a will there's a way."

Chief Vehicle Officer, sustainable energy business

Freight and deliveries enable London's economy to function. From the food we eat and the appliances we buy, to construction materials, tradespersons and COVID-19 tests, all the goods we consume and many of the services we rely on need to travel across the city. The COVID-19 pandemic and Brexit have drastically highlighted the impact of not receiving the goods we need on time – empty shelves, critical commodities in short supply, and restaurants unable to open because of a lack of stock.² Logistics infrastructure is an essential asset for any city's future – and all the more so for a global city as large and densely populated as London.

However, the mobility of goods and services comes at a high cost. Most freight is moved on roads and in non-electric vehicles, which make a large contribution to air pollution and carbon emissions, pose a risk to road safety, and can create widespread inefficiencies such as congestion. With deliveries booming, the number of vans on London's roads shows no signs of decreasing anytime soon. In March 2021, the registration of light commercial vehicles (LCVs) saw a massive increase compared to 2020. Diesel vans saw an 82 per cent increase in March 2021 compared to 2020, and for petrol vans there was a twofold increase.³

Figure 1: London vehicle kilometres travelled and population, indexed against 1993 levels



Source: Department for Transport (2020). Road Traffic Statistics.

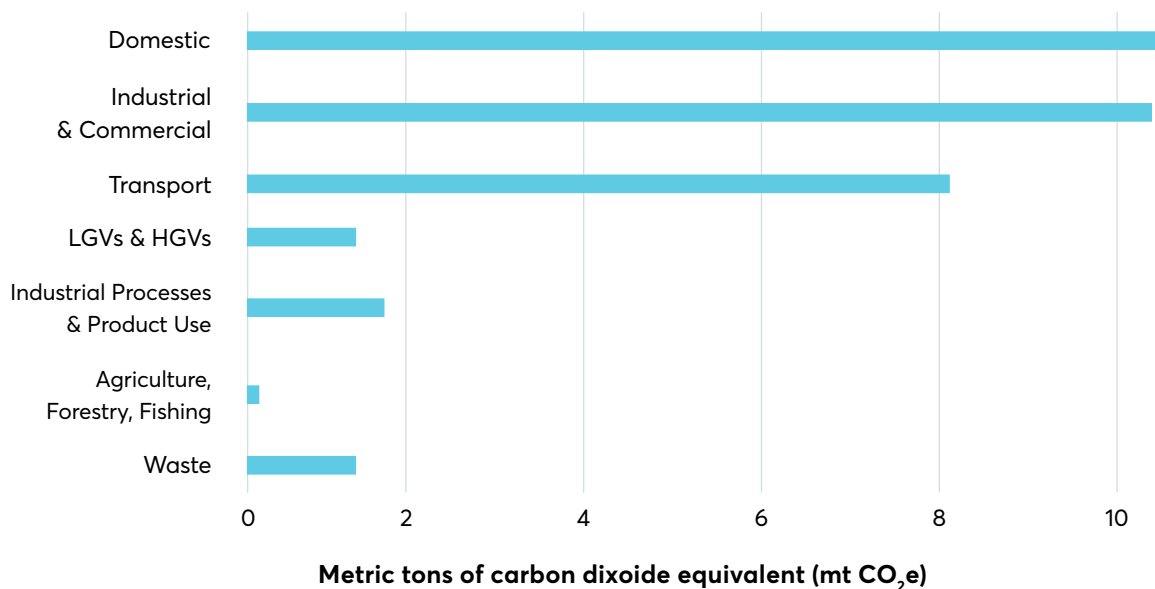
Carbon emissions

London is racing to meet its net zero carbon goal by 2030, as local and national governments in the UK and around the world declare a climate emergency and recognise the urgency of cutting carbon emissions drastically. Decarbonising road transport, which makes up around a fifth of total emissions in London, is essential to achieving this target.⁴ The need is especially acute with freight vehicles, which emit a quarter of the total carbon emissions from transport – despite only making up 15 per cent of total vehicle miles in London.⁵

Electrification is one way to reduce carbon emissions from vans and lorries. However, not all agree that this is the silver bullet. While the number of electric vans is increasing, it is not happening at a pace that would meet the timeframe of the city's net zero goal. The prices of currently available electric vehicles are prohibitive to many small businesses, and workers who own their vans will struggle to pay the upfront costs of transition without government subsidy. Meanwhile, in the case of heavy goods vehicles (HGVs), electrification is an even more distant prospect – because their range, size and battery requirements are so difficult to meet with current technologies.⁶

Figure 2: Greenhouse Gas emissions by sector

Emissions by sector



Source: London Energy and Greenhouse Gas Inventory (2018). Note this is an estimate of emissions within the city.

Air pollution

"The death of Ella Adoo-Kissi-Debrah galvanised the community and shed light on the long-term and fatal effects of air pollution as more information came to light."

Community activist

"Certain groups are disproportionately affected by air pollution: those with existing health problems, children, marginalised and minoritised groups."

Air Quality Analyst, London borough

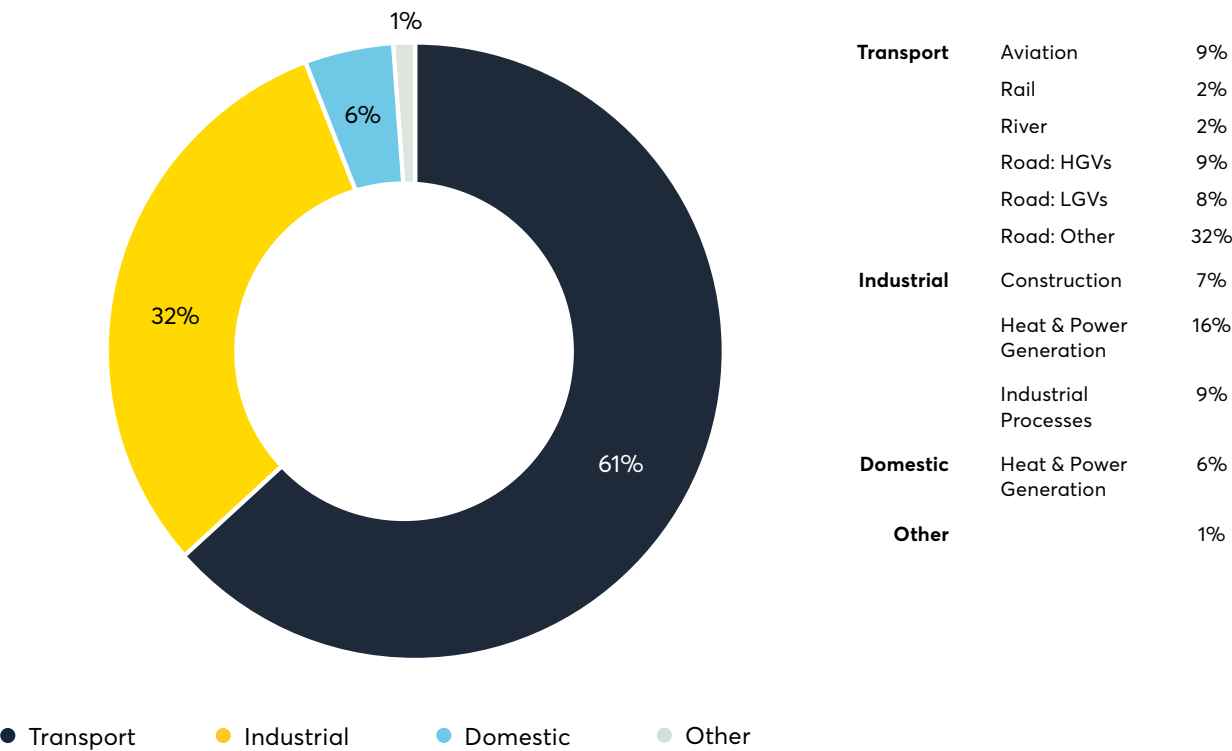
Air pollution, a largely invisible hazard, causes thousands of deaths in London each year. Research commissioned by Transport for London (TfL) and the Greater London Authority (GLA) estimated that the equivalent of 3,600 to 4,000 deaths in 2019 were caused by human-made PM_{2.5} and NO_x emissions.

Road transport is the biggest cause of air pollution in London. Freight vehicle journeys, which are increasing, contribute around one-third of this total.

Figure 3: Health impact of key pollutants from freight vehicles

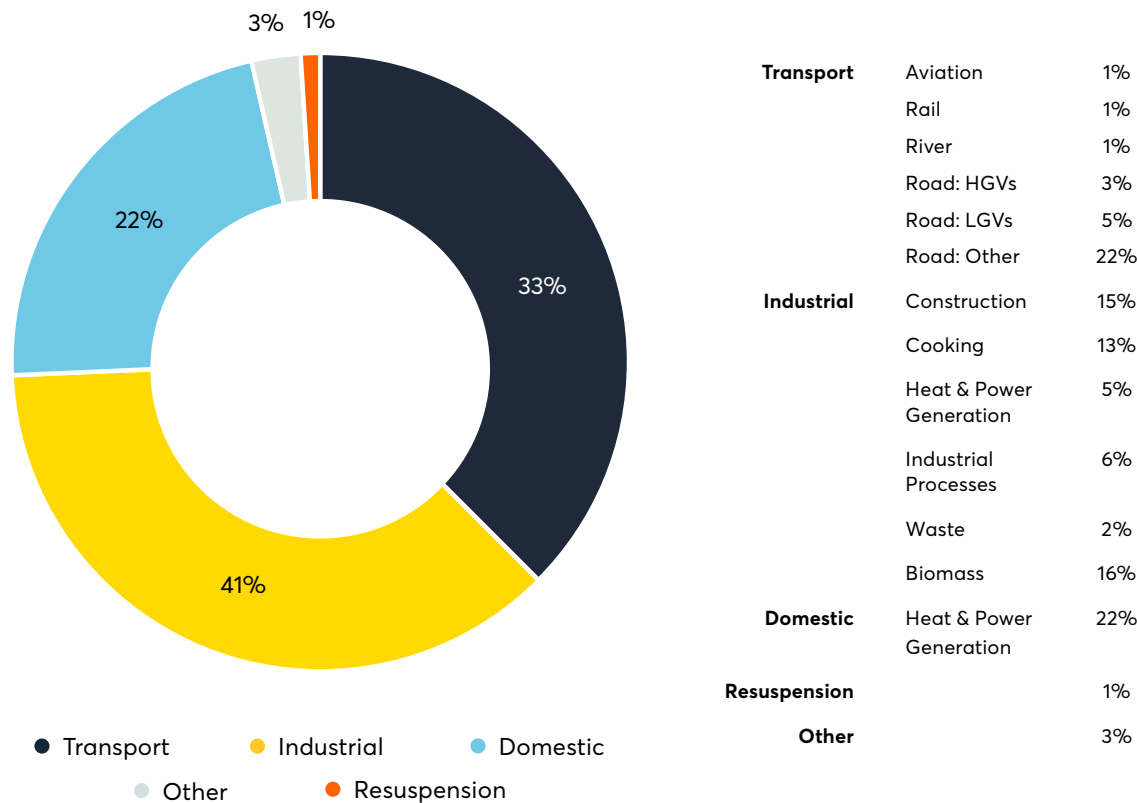
Pollutants	Impacts
Nitrogen Oxides (NO_x)	<p>NO_x refers to a family of compounds that include nitrogen dioxide (NO₂) and nitric oxide (NO). Long-term exposure to these compounds can lead to inflamed lungs, stunted childhood growth and an increased risk of respiratory diseases.⁷</p> <p>34 per cent of the NO_x produced by road transport comes from freight vehicles.⁸ In 2016, the amount of NO_x emitted by freight vehicles in London (7,170 tonnes) was close to the total amount released by cars (8,133 tonnes), despite cars travelling almost five times more miles than LGVs and HGVs in the same year.⁹</p>
Particulate matter (PM_{2.5})	<p>"Particulate matter" refers to very small particles or liquid droplets in the air. It is considered to be one of the most dangerous air pollutants. Populations that are exposed to higher levels are more likely to develop asthma and have increased risk of death from lung and heart diseases.¹⁰ 27 per cent of the fine particulate matter (PM_{2.5}) from road transport exhaust emissions comes from freight vehicles. This excludes brake and tyre wear – also sources of particulate matter – which is likely to be disproportionately worse for freight vehicles given their heavier loads.</p>

Figure 4: NO_x Emissions in Greater London (2016)



Source: London Atmospheric Emissions Inventory 2016

Figure 5: PM_{2.5} Emissions in Greater London (2016)



Source: London Atmospheric Emissions Inventory 2016

The fuels used to power vehicles are critical sources of pollutants. However, non-exhaust emissions (NEEs) from brake and tyre wear also result in poor air quality by releasing high rates of pollutants such as PM_{2.5}. Unfortunately, NEEs are less likely to be regulated and tend to be unaccounted for in policy that aims to tackle air pollution.

For instance, the Ultra Low Emission Zone (ULEZ) has been important in reducing exhaust related emissions, and NO_x levels in central London were down 35 per cent before lockdown in 2020.¹¹ However, a researcher specialising in air quality emphasised that while the ULEZ targets exhaust emissions, the new electric vehicles are often heavier – as are the batteries needed to power them – and so are more likely to produce NEEs from brake and tyre friction.¹² Consequently, while the transition to electric vehicles is important to tackling pollution, ultimately traffic will also need to be reduced overall to meet clean air goals.

While almost all Londoners are exposed to dangerous levels of air pollution, there is evidence that poorer and Black, Asian and Minority Ethnic Londoners are more vulnerable to higher levels.¹³ Analysis by the Environmental Defense Fund found that the average NO_x levels at schools with students from the most deprived areas were almost a third higher than those at schools with pupils from the least deprived areas.¹⁴

Congestion

Congestion is a major source of frustration for all road users. It stops people and workers getting to where they need to go, adding economic costs and contributing to poor health. London is the most congested city in the UK,¹⁵ and in 2017 the cost of congestion in our city was estimated at £2bn and growing.¹⁶ Congestion is particularly costly for freight and deliveries, as 90 per cent of freight lifted is moved on London's roads,¹⁷ and lorries and vans make up 17 per cent of overall road traffic in London.

During a decade of population growth, the growth in journeys travelled by vans has outpaced those made by heavier lorries. Between 2010 and 2019, the miles travelled by light goods vehicles (LGVs) in London increased by 68 per cent.¹⁸ This occurred despite an overall reduction in traffic, particularly in central London, and partly because of the Congestion Charge.¹⁹ During that same period, miles travelled by HGVs decreased by 15 per cent due to multiple factors including the Low Emission Zone, a charge on the most polluting heavy diesel vehicles, a long-term shortage of HGV drivers, and stricter licensing legislation for lorries (which makes vans a more convenient option for operators).

Congestion slows journeys, increases delivery times, and raises costs for businesses – with consumers ultimately shouldering this through higher prices. These issues are a particular problem for HGV drivers, who, according to EU and UK legislation, are not permitted to drive for more than nine and 10 hours a day (respectively) and must take breaks and rests at consistent intervals during the day.²⁰ To overcome this issue, operators may compensate by putting more vans on the roads to make those same journeys, inadvertently contributing to congestion and air pollution.

Road safety

Freight vehicles – and HGVs especially – can pose significant risks to the safety of other road users and pedestrians. Data by Transport for London shows that in 2019, 445 people suffered serious injuries from incidents that involved goods vehicles – an increase of six per cent from 2018.²¹ There were also 21 fatalities from collisions involving goods vehicles – a decrease of 32 per cent over the same period. Fatalities and casualties may continue to decrease as the city implements the Mayor of London's Vision Zero policies. For example, the Direct Vision Standard permit, which measures how much a

driver can see through their cab window, was introduced in 2020 and requires all HGVs weighing more than 12 tonnes to have a safety permit before entering or operating in London.²²

London's unique context

London's geography, history and built environment creates specific constraints for freight and deliveries:

Narrow streets and tight street patterns

Narrow streets and historic road layouts do not accommodate large vehicles well – and many London streets require clever use of space to manage conflict between different vehicles such as buses, taxis, privately owned cars and cyclists. Increasing pedestrianisation of streets to promote more active travel can also pose a challenge for large freight vehicles.

Scale and high density

London is much bigger than other UK cities. Its population density is also ten times higher than that of the North West, the second most densely populated region in England.²³ London's scale and density means some solutions that might work in smaller cities – for example, peripheral consolidation centres – may not work here.

The high cost of land

Competing pressures over land – including the pressing need to ensure that the capital has enough housing for its population – have meant that over the past two decades, much of London's industrial land has been released for other uses. Additionally, the high cost of land means that most retail stores in London have limited warehousing and storage space, as well as fewer off-street delivery bays. The lack of suitable industrial space also limits the space available for consolidation hubs closer to consumers, meaning that vehicles need to travel over longer distances. Research conducted by Transport for London found that a one per cent reduction in industrial land available in London increases distances driven by goods vehicles by 0.5 per cent.²⁴

Parking

Parking restrictions in London stop vehicles parking illegally in delivery bays and on yellow lines outside delivery addresses. However, the lack of available legal parking means that delivery and service operators sometimes park illegally. They pay more penalty charge notices in London than anywhere else in the UK.²⁵

Timing constraints

The London Lorry Control Scheme prevents heavy goods vehicles (HGVs) over 18 tonnes maximum gross weight from operating at night and at weekends. While the scheme is an important initiative to reduce the environmental and noise pollution of HGVs – especially in residential areas – it can also mean certain industries that might otherwise operate at night or early in the morning (such as construction and waste companies) are unable to do so.²⁶

Road pricing

The Congestion Charge, Low Emission Zone and Ultra Low Emission Zone have all contributed to a reduction in congestion and air pollution in the city. While they have been important in freeing up road space that can be used by freight vehicles, they also make travelling into the city expensive for freight and van operators serving the city.

Fragmented local government

While London's 32 boroughs and the City of London Corporation all share similar challenges, they act independently in much of their waste and road management operations, making it difficult to coordinate strategic, London-wide action. Furthermore, the city's roads are run by additional bodies including national agencies and London government, who have different legal responsibilities regarding road space. Highways England operates motorways within the Greater London boundary, and Transport for London manages the capital's red routes. The rest of London's dense network of roads is managed by boroughs.²⁷ Different local approaches to road management can also complicate life for commercial vehicle drivers, who will not necessarily be aware of the different loading policies as they pass through the invisible boundary from one borough to another.

At the same time, London also offers unique opportunities that could be leveraged to create more sustainable and efficient freight services:

Multiple modal networks

The city possesses a range of transport modes – including river and rail – which if utilised cleverly have the potential to shift freight off London's roads significantly. For example, freight trains remove up to 76 HGVs from the roads in a single journey, and water freight is estimated to shift the equivalent of 265,000 HGV movements yearly.²⁸ The current shortage of HGV drivers – combined with the fact that the expansion of the ULEZ looks likely to make it more expensive to move goods into London – means that rail and river freight could become more economically viable options. However, any shift to rail and water freight will have to ensure that increased use of these modes remains low-carbon, especially in the absence of strict emission standards for the Thames.²⁹

Benefits of density

While the scale of London and its high density can lead to higher congestion and slower deliveries, it can also mean that deliveries are closer to one another and so offer economies of scale to delivery operations.³⁰ Small “micromobility” freight vehicles such as cargo bikes are able to use London's high density to their advantage. While there are limits to the volume and types of goods they can shift, cargo bikes can move through traffic easily, use cycling infrastructure and utilise roads that would restrict the movement of cars, vans and lorries. This sometimes allows them to offer faster delivery times.³¹

2. The goods and services moving around London



"The different vehicles that operate on the kerbside have different needs and are nuanced – from servicing vehicles to delivery vans – and they all have different safety issues and regulations."

Founder, tech company

Like all cities, London has a huge range of freight and delivery needs. Vehicles might start and finish their journey in the city, leave London for elsewhere, or vice versa. Different types of goods and services have different requirements. Parcels need to be delivered quickly, and some products need refrigeration, while construction waste can travel at slower speeds. Some deliveries are bulky, and others can be easily carried on a bike.

In this chapter, we set out the key reasons that freight and delivery journeys are made in London. We focus on five sectors that together make up the bulk of freight vehicle movements: parcel deliveries, food supply chains, construction supply chains, servicing, and waste and reuse. There are of course other reasons for freight vehicles to be on the road, as well as some overlap between these categories – for example, waste from one building site can become part of the construction supply chain for another. But a survey of these five key sectors will show us how journeys are changing now, how they are likely to change in future, and the different ways that we can reduce their impact on the city and the planet.

Parcel delivery

The parcel delivery sector – goods delivered direct to consumers, usually at small scale – has been increasing in London for some time as a result of the shift to online shopping.³² There has also been a corresponding decline in bricks-and-mortar retail, and both trends have been accelerated by the coronavirus lockdowns. The end of pandemic restrictions might abate this change somewhat, but it does not seem likely to reverse it.³³ In addition, a minority of goods received in delivery parcels are returned to the retailer, increasing volumes further.

Parcel delivery to people's homes across the UK was once the preserve of the Royal Mail and its sister company Parcelforce. However, changing competition rules and the sector's expansion mean there are now multiple, competing parcel delivery firms on our roads. Some retailers also have their own delivery fleet. These are often large stores supplying bulky goods like electrical items and furniture, or smaller local firms like florists who make delivery rounds in a small area. As a result, it is common to see delivery vans from several companies arrive at the same address in a short space of time and compete for the kerbside.

Most parcel deliveries (except those handled by the retailer themselves) are picked up from the retailer and taken to a distribution centre. If they are travelling a long way, they may be delivered to another, more local distribution centre, before being unpacked into smaller vehicles and taken to people's homes. A small amount of mail travels by train, usually from London to Scotland, but the vast majority of deliveries are made by road. Bicycle and motorcycle couriers have been part of inner London's logistics infrastructure for many years: these were often used to transport time-sensitive documents between offices, as they could move faster in traffic than a car. Document deliveries are now less common, but bike deliveries are becoming more common – partly driven by increased interest in low-carbon and low-pollution choices, and partly by the development of cargo e-bikes, which make it easier to carry heavy loads over longer distances.

Parcel delivery firms face significant challenges operating in London. Road charging schemes operate in the city for different types of vehicles, including the expanded ULEZ increase costs. Congestion levels are often

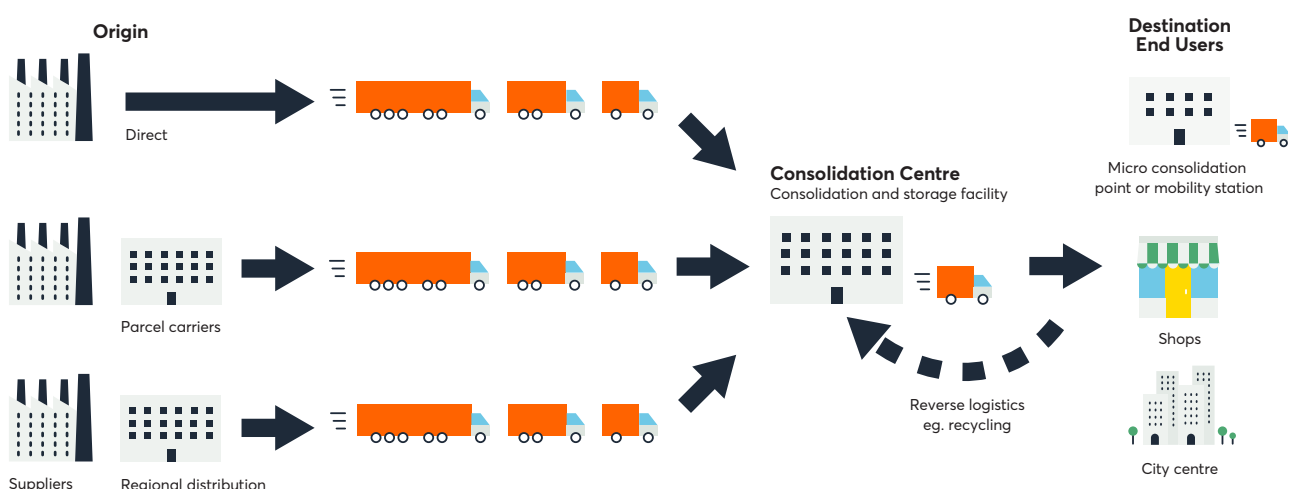
high, and this makes it harder to time deliveries accurately, which can be frustrating for consumers. In some places, changes to encourage cycling and walking have increased congestion and slowed journey times for larger vehicles. However, these changes may encourage modal shifts as operators find alternative ways to ensure reliable and efficient deliveries. In 2020, DHL launched its first riverboat parcel delivery service, which brings shipments to Bankside Pier for onward “last mile” delivery by cargo bikes.

Retailers and parcel carriers compete on speed, price, delivery options, and product range. To do so, they need to store products either within the city, or at its fringe. One interviewee described this as parcel companies “trying to get as close as possible to people’s chimneys”.³⁴ A shortage of industrial land for repacking loads closer to their final destinations makes it harder for companies to manage logistics, and also increases traffic as more vehicles drive longer distances, as illustrated in Figure 1).

There is controversy as to whether the explosion in parcel deliveries should be curbed. Some argue that home deliveries replace journeys that consumers would have made to the shops, some by private vehicle.³⁵ This is true, though the replacement rate is unclear, and inevitably deliveries will also replace journeys that consumers would have made by public transport or active travel. Recent research in the US context suggests that e-commerce currently emits less carbon than traditional retail if customers would otherwise drive to the shop. Traditional retail tends to be more carbon efficient if customers make trips by public transport or active travel, or buy from several shops during one trip.³⁶ Though less relevant during the pandemic, personal deliveries to offices increase the number of delivery vehicles driving into central London, rather than to surrounding residential areas.

Concern about ill health caused by air pollution is growing, and if London is to meet the Mayor’s goal of net zero emissions by 2030 it needs to rapidly decarbonise its transport system. Demand for home deliveries is expected to continue increasing over the next few years, so there is a pressing need for change in how London’s parcels are delivered.³⁷ This is likely to entail more use of bikes and e-bikes, last-mile delivery hubs to reduce congestion, and parcel lockers for consumer collection. These solutions are discussed in more detail below.

Figure 6: An example of delivery consolidation to reduce vehicle journeys



Food and its supply chains

Before 2020, the movement of food around London received comparatively little attention, but since then the impacts of Brexit and the pandemic have generated far more interest in the topic. The most disastrous predictions – of total disruption to the supply chain – have not fully materialised, but there have been sporadic shortages on supermarket shelves and insufficient delivery slots to meet demand at times. These are due to a complex combination of factors: bulk buying in the early days of the pandemic, reduced production due to social distancing within facilities, increased demand for online delivery slots, labour shortages due to staff illness (or self-isolation), and disruptions to travel at the Channel Ports as new COVID-19 testing and post-Brexit trade rules have come into play.

London imports almost all its food from other parts of the UK and overseas. Earlier in its journey, food may travel by HGV, ship, or occasionally by air. Most food is then moved into the city by HGV, with the bulk going to supermarkets. Larger stores may receive multiple lorry deliveries per day, mostly overnight when the store is closed. Some of these lorries will be transporting frozen or refrigerated goods, which means unexpected journey delays can have a significant impact. Congestion is less of an issue for these HGVs as their drivers tend to travel at night, but congestion in and out of London earlier in their journeys can be a problem. Such issues could increase the air pollution and carbon emissions caused by HGVs.

Supermarkets were among the earliest businesses to move to e-commerce – gradually over the last decade or so, and then very suddenly during the pandemic. There are reports that demand for online food deliveries is now falling – perhaps due to people returning to supermarkets and other food shops, and perhaps because the proportion of food that people eat in the home is now falling as we return to restaurants and takeaways. It seems likely, however, that demand for online deliveries will remain higher than before the pandemic. Historically, many online orders were collected by delivery staff from standard retail shops, but in the last few years supermarkets have begun to experiment with “dark stores” which are used only for delivery orders. These are cheaper to run than ordinary stores as they do not need customer facilities, promotional displays, or a convenient location for customer visits. They can also be optimised for very fast collection of goods by skilled staff. However, industrial land shortages in London can make it harder to set them up near residential areas.

In the last year, London has experienced rapid growth in short-notice, small-scale grocery delivery services. These deliver a limited range of goods by bike or motorbike, usually in less than an hour – putting them somewhere between standard supermarket deliveries and takeaway services.³⁸ Most are independent companies, but some supermarkets have launched similar services for their own goods, and it is sometimes possible to order groceries through the established takeaway apps. This is a rapidly growing sector, but it is hard to say what the future trajectory of this segment of the market will be, particularly as lifestyle and working patterns are disrupted during the recovery from the pandemic. It is also difficult to say what the congestion and pollution impact of the new ultra-fast delivery services will be. This will depend on what type of vehicle they use, whether they replace a trip to the shops that would otherwise be made by car, and whether deliveries are made by larger vehicles that create congestion as they park to unload deliveries. For these reasons, as well as road safety and local air quality concerns, some London communities have set up vocal opposition movements against the opening of food delivery consolidation centres near them.

Overall, it is likely that supermarket home deliveries take traffic off the road. Each LGV can hold multiple orders, and in many cases each order replaces a car trip to the supermarket. For some London

households, the ability to have groceries delivered routinely makes it possible to live in the city without a private car. However, the need for groceries to be delivered to households in specific time slots means that delivery vehicles' journeys are not always on the shortest possible route – and some shops are beginning to offer cheaper slots with a wider delivery window so that they can better optimise routes.

Construction and its supply chains

Like all major cities, London has hundreds of construction sites at any one time. These range from small domestic extensions and minor roadworks to vast, multi-site projects that take many years, like the tunnelling and station construction for the Elizabeth Line. Whilst it is hard to predict the exact mix of construction in London over the next decade, volumes are likely to be high – particularly for new homes and retrofits to make properties more energy-efficient.

Traffic to and from construction sites broadly falls into three categories: building materials coming in, building waste going out, and construction machinery being moved to and from the site. For big sites, the volumes can be vast: for instance, the volume of excavated material for the Elizabeth Line tunnels was estimated at six million cubic metres – a third of London's total annual waste.³⁹ Most construction sites are far smaller than this, but the combined volume of materials for smaller sites can still be very high.

It is often difficult to store materials or building waste on site, so site managers are keen to get both in and out quickly, thereby avoiding costly delays. As with many other freight and deliveries sectors, the lack of industrial space in London makes this harder, as it is more difficult to store materials near to sites. Fear of theft means that tools and smaller machinery often cannot be left on site overnight, so they must be packed into vans and driven off site every evening. This increases the volume of traffic, particularly if workers would otherwise be able to return home via active travel or public transport. The noise, dust, and congestion caused by construction site traffic is often a cause of tension with local residents, and can contribute to their reluctance to see new building developments near their homes.

While most construction materials and wastes are moved by HGVs and LGVs, some are moved by rail freight. Some of the waste materials from the construction of the Olympic Park were moved away from the site by canal, and construction materials needed for riverside developments are sometimes taken by boat on the Thames. This practice has been growing as local authorities have requested that new developments maximise use of the river. The Thames Tideway Tunnel project has transported 95 per cent of its tunnelling waste on river barges, with the largest of these able to carry enough materials to replace 100 lorry journeys.⁴⁰ With current technologies, lower-carbon forms of transport for construction materials are some way off. Strategies for mitigating pollution and congestion therefore need to reduce the overall number and length of journeys for materials and machinery, reduce traffic so that construction vehicles can be used more easily, and build up our ability to transport materials, aggregates and waste via the tidal Thames.

Servicing

London has a huge variety of service sector industries which use road transport. These range from mobile hairdressers and plumbers to Internet installers and district nurses, serving both domestic and commercial premises. It is hard to form generalisations about such a large sector, but it seems clear that servicing activities in London have been growing for some decades.

There is considerable crossover between this group and the construction sector described above: many small traders will take on both building and maintenance work, and so challenges overlap between the two groups. Many service sector providers and construction providers are affected by the Congestion Charge and ULEZ. For small companies or sole traders, the costs of upgrading to ULEZ-compliant vehicles can be prohibitive. There are recent reports that the second-hand value of conventional LGVs, many of which incur the additional ULEZ charge, has plummeted in London. Congestion can also cause significant problems for service sector trips, especially for health and care services: a traffic jam can easily mean a client is waiting in real discomfort to be helped to have a meal or take a shower. Moreover, difficulty in making visits makes adult social care services, already under significant strain, likely to be cut still further.

Unlike construction, waste, parcel delivery and food supply chain vehicles – which generally either use designated parking sites or stop only briefly – service sector vehicles often need to park in residential or commercial areas for long periods. If they can't find a parking space, workers might need to walk while carrying heavy equipment. This is a particular problem in London, as fewer homes, shops and offices have designated off-street parking and there are more parking controls than in other parts of the country. Some small traders report that they do not take on work in areas where parking is likely to be difficult, as it makes jobs too costly and time consuming.

Many journeys to deliver a service in London are already made by public transport or active travel. For trips that require little or no equipment, general incentives to reduce car and van use are likely to be effective: broadly, this means making driving more expensive and less convenient, and making other travel modes less expensive and more convenient. However, this needs to be done in a way that does not make journeys with tools or equipment unduly difficult – a complex challenge in a particularly diverse part of the freight and deliveries sector.

Waste and reuse

London produces a lot of waste – about half a tonne per household per year, plus more from commercial premises, in addition to the construction waste mentioned above. Much of this can be re-used, composted or recycled, which in most cases requires some type of industrial processing. Residual waste that cannot be recycled is either incinerated (within London and elsewhere) or taken to landfill. To reduce carbon emissions and pollution from waste management, the Mayor has committed the city to become “net self-sufficient” for waste by 2026, requiring all waste to be managed within London. Since there are no active landfill sites within London, this means that there will be a greater role for incineration, re-use and recycling. While the proportion of waste being recycled has increased in recent years, and is expected to grow further, population growth may mean the total volume of waste will not be reduced by much.

At present, most of London's residential and office waste is collected from the kerbside, with recyclable materials taken to large sorting centres and non-recyclable waste taken either to incinerators or to a mechanical and biological treatment plant at Frog Island. After being sorted and processed, recycled material is sold on for industrial use on a commercial basis – paper to paper manufacturers, glass to bottle makers, and so on. More specialised commercial waste is sometimes taken directly to processors for recycling, and some waste is taken directly to council tips by consumers. Freight movements around incinerators and sorting centres are often very unpopular with residents due to the noise, the smell, and inevitable incidents where waste is dropped or blown out of vehicles by the wind.

Kerbside waste and recycling collections are made by specialist trucks run by companies under contract to local authorities. Most of these trucks have petrol or diesel engines, but some local authorities now have electric vehicles, and others will require it of their suppliers in future. Collections are mostly taken by these trucks to sorting centres (largely located on industrial sites in outer London) or residual waste processing (incinerators or mechanical and biological treatment). However, waste going to the Belvedere incinerator in southeast London travels by boat from the city centre, using the Thames tides to reduce the power needed for the boats.⁴¹

In parts of London where most waste is generated by business activity (central London or industrial areas), there are many different waste removal companies each operating their own vehicles, leading to unnecessary journeys. This is where coordinated procurement could help. In central London, the Crown Estate has been asking business tenants to pick from a smaller number of selected waste removal companies that already operate in the vicinity, in order to reduce the number of vehicles travelling in and through the area.

Local authorities are responsible for their own residential waste, and take any profit that is made from selling recyclable materials. As a result, the goods which are taken for recycling and the frequency of collections varies from borough to borough. In London, local authorities are grouped into five waste authorities, who coordinate procurement for the processing of waste.⁴² There is currently no centralised system for managing commercial or construction waste. Some is collected by local authorities, and some by commercial operators acting independently. It is relatively easy for local authorities to create an efficient collection route within their borough, but beyond borough boundaries it is harder for different parties to coordinate so as to reduce the total distance travelled by freight carrying waste and recycling. There is a similar issue after recycling has been processed: because it is sold on a commercial basis without central organisation, manufacturers may not be buying it from the closest provider, and loads are often sent out in small vans rather than being consolidated for multiple similar purchasers.

The complexity of this system means that while there is scope to reduce pollution and congestion from waste and recycling freight, it is not easy to achieve. The situation is complicated further by residents' opposition to waste treatment plants being located in their area: if a plan is turned down, it will often mean that waste has to travel further. However, there may well be scope for more river and rail journeys, more use of electric vehicles, and reductions in total vehicle mileage.

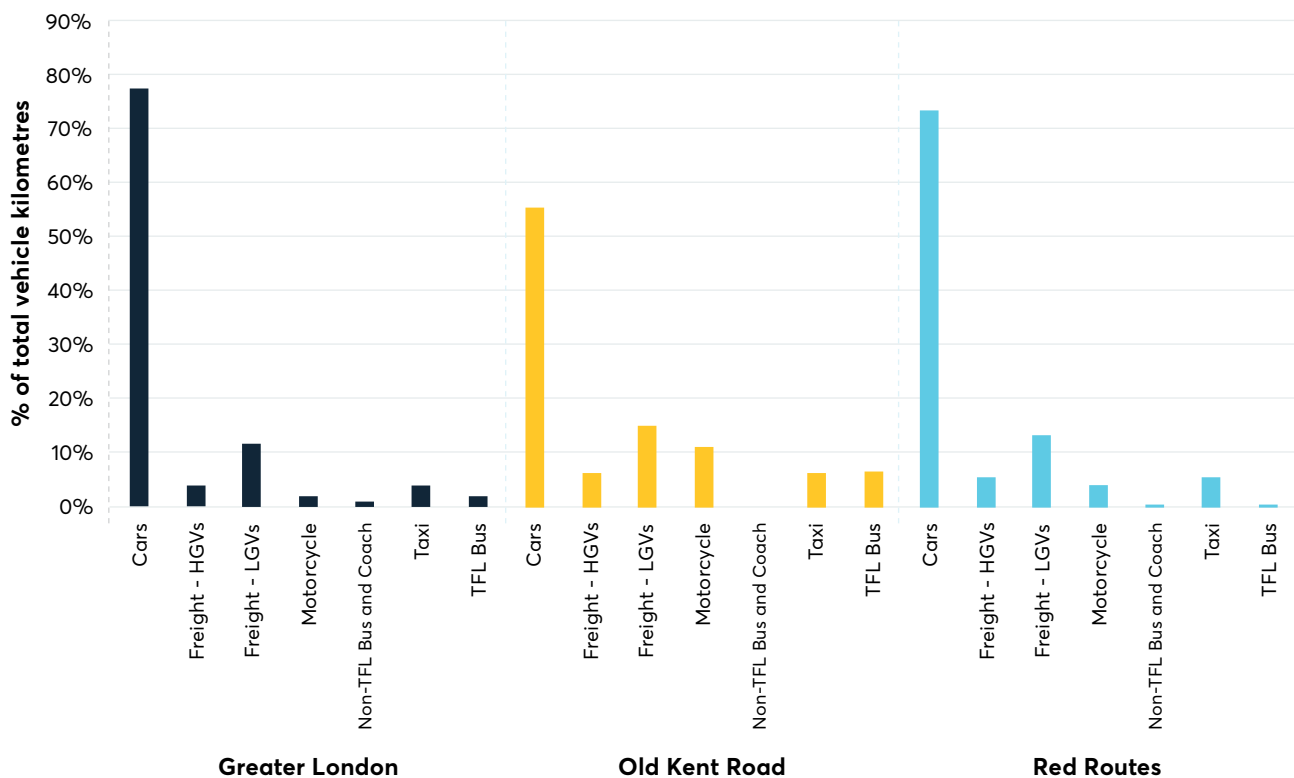
3. Deep dive: Old Kent Road



This chapter looks at one of London’s most challenging local areas when it comes to managing the impacts of freight and deliveries on air pollution. We have chosen the Old Kent Road since it is one of the worst in London for exposure to air pollution, and has been designated by the GLA as an “air quality focus area”. It also serves many, sometimes competing, functions:

- A high street used by local people for its grocery stores, pharmacists, schools, restaurants, takeaways, cafes, and religious spaces. It is also a popular shopping destination, with several “big box” stores such as B&Q. The road is also home to a hotel, as well as many businesses led by people from Latin American and African diasporas, making it a hub for several communities.
- A dense residential area where the population is more likely to be deprived and racialised. Residents have among the worst health outcomes in London.⁴³
- A Red Route (part of the TfL-managed Strategic Route Network) and a strategic freight corridor into central and southeast London, used by a wide range of vehicles. Freight and buses make up a greater proportion of traffic on the Old Kent Road than they do on average across London (see Figure 2 below). In addition, 21 per cent of vehicle miles travelled on the Old Kent Road are by freight vehicles, compared to 15 per cent in Greater London and 18 per cent on Red Routes.
- A freight/deliveries hub and a prime industrial location. Local depots include carrier companies, a waste removal company, and many industrial occupiers.

Figure 7: NO_x Emissions in Greater London (2016)



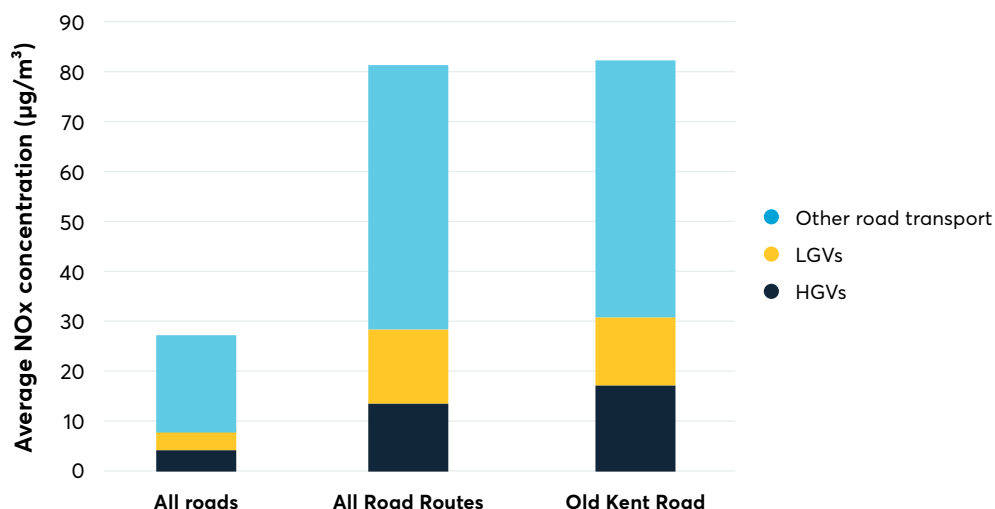
Source: London Atmospheric Emissions Inventory 2016

Air pollution on the Old Kent Road

The following illustrations highlight the disproportionate impact of goods vehicles on air pollution, and why this is a particular challenge for key freight corridors like the Old Kent Road.

Figure 8: Air pollution emissions from freight vehicles

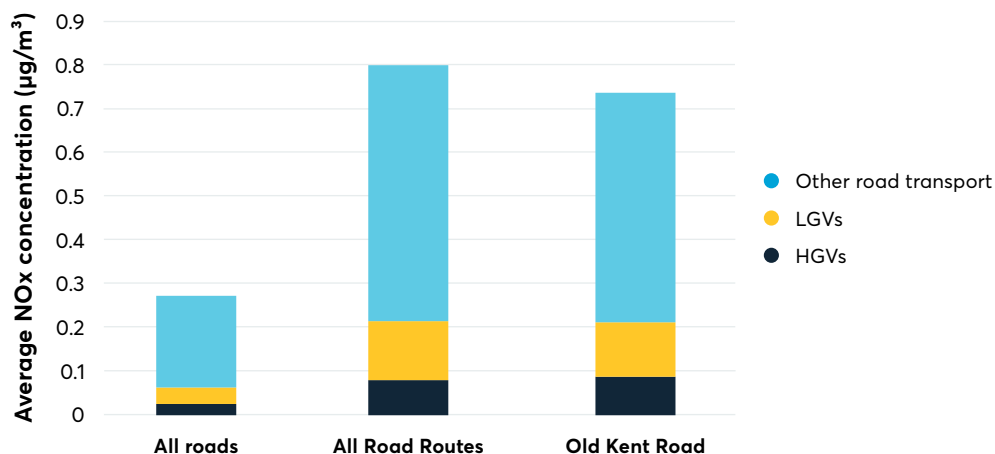
Freight vehicles are responsible for an estimated 38% of average NO_x concentrations from road transport sources on Old Kent Road, compared to 31% from freight vehicles on average across all London's roads.



Source: EDF Europe analysis of modelled data produced by Cambridge Environmental Research Consultants (CERC) as part of the London Pilot Project.

Figure 9: Particulate matter from exhausts on London roads

Freight vehicles are responsible for 29 per cent of average PM_{2.5} concentrations from road transport sources on Old Kent Road, compared to 23 per cent from freight vehicles on average across all London's roads. (NB: These average concentrations do not include PM_{2.5} from brake and tyre wear, which can make up a large proportion of the concentration from road transport sources.)

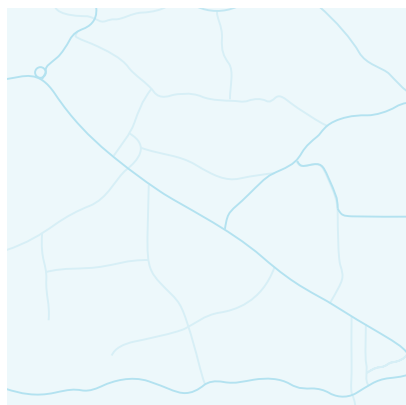


Source: EDF Europe analysis of modelled data produced by Cambridge Environmental Research Consultants (CERC) as part of the London Pilot Project.

NO_x concentrations in the Old Kent Road area by vehicle type

Freight vehicles are responsible for 29 per cent of average PM_{2.5} concentrations from road transport sources on Old Kent Road, compared to 23 per cent from freight vehicles on average across all London's roads. (NB: These average concentrations do not include PM_{2.5} from brake and tyre wear, which can make up a large proportion of the concentration from road transport sources.)

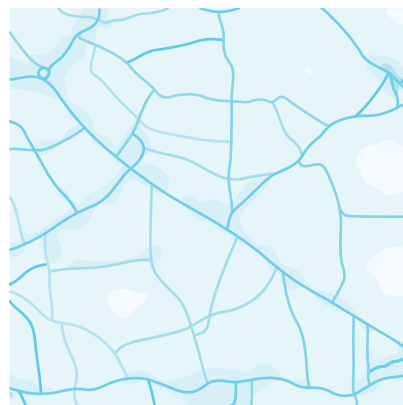
LGVs



HGVs



All other road transport



0 250 500



Source: EDF Europe analysis of modelled data produced by Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project.

"All other road transport" includes the following sources: diesel cars, petrol cars, non-TfL buses and coaches, TfL buses, taxis, and motorcycles.

Freight vehicle journeys

As set out in previous chapters, freight journeys are very diverse in terms of distance, purpose and vehicle type – and so different air pollution mitigation measures will work for different types of trips. Data analysis provided by the Environmental Defense Fund Europe offers information on heavy goods vehicles using the Old Kent Road from a sample of 7,100 trips made by goods vehicles on the Old Kent Road during the week of 9-15 September 2019. All trips used in this analysis were made by HGVs, which are estimated to make up 29 per cent of total miles travelled by freight vehicles on the Old Kent Road.

Patterns of demand

HGVs using the Old Kent Road show a mix of local and external trip generation. However, the majority were generated locally:

- 24 per cent of freight trips using the Old Kent Road started and finished locally – within 2.5km of the road.
- 49 per cent of freight trips using the Old Kent Road had either an origin or a destination within 1km of the road itself, and 73 per cent within 2.5km.
- 28 per cent of trips were passing through the area.

Figure 10: Cumulative % of heavy duty vehicle OKR trips

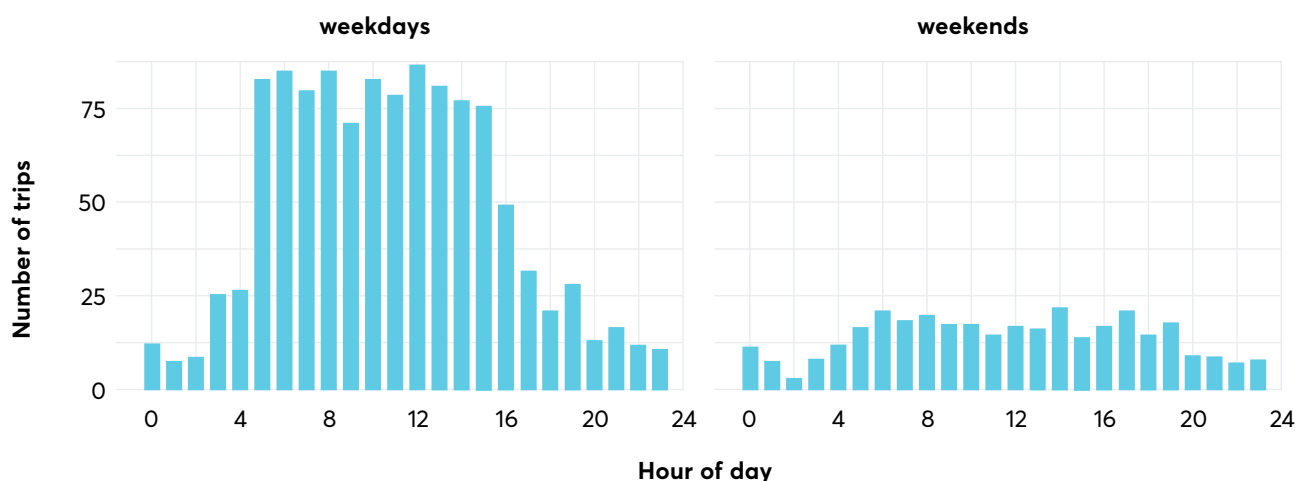
		Trip destination - distance					
Trip origin - distance		<1km	1 - 2.5km	2.5 - 5km	5-10km	10 - 20km	20km+
	<1km	8%	5%	4%	3%	3%	3%
	<2.5km	6%	4%	3%	2%	2%	2%
	<5km	5%	3%	3%	2%	2%	2%
	<10km	3%	3%	3%	2%	2%	2%
	<20km	3%	2%	2%	1%	1%	0%
	20km+	4%	3%	4%	2%	0%	0%

Source: EDF Europe analysis of INRIX data.

Time of journey

Vehicle journeys mostly take place on weekdays between early morning and mid-afternoon, with fewer trips in the late afternoon, evening, night-time and at weekends. Local trips peak around midday, while external trips peak during the early morning rush hour. There is an opportunity to retime deliveries for later hours when there are fewer pedestrians or cyclists on the roads, in order to reduce exposure to air pollution.

Figure 11: Average number of trips on Old Kent Road by hour - week commencing 9.9.2019



Source: EDF Europe analysis of INRIX data.

The view from local businesses

We surveyed a wide range of businesses operating on or near Old Kent Road to reflect the economic diversity of the area. The businesses surveyed included restaurants, supermarkets, parcel carriers, manufacturers and retailers. While the sample size means the survey is not statistically representative, it nonetheless gives an idea of the diversity of delivery requirements, as well as the common attitudes towards the shift to low- or zero-emission freight solutions. Half of the surveys were conducted online and half in person. In-person surveys were also complemented with follow-up questions.

Sustainable commitments:

- It was fairly common for businesses to have either formal or informal sustainability targets (21 out of 30 businesses had them).

How deliveries are made:

- According to 22 out of 26 businesses, deliveries received or made tend to require extra care due to size, weight or storage requirements.
- Most businesses (24 out of 28) said they didn't decide how deliveries were made. However, many said that they picked suppliers based on cost and reliability. In the case of chains, decisions were generally made by head office.
- Among the businesses that made deliveries to customers, many (8 out of 18) did not own any or all of the vehicles they used for deliveries.
- Many businesses making or receiving deliveries said they struggled to find space for loading or unloading – meaning they either park far away, lose time looking for a place, or receive fines.

Perceptions of solutions to reduce their air pollution impacts:

- Where businesses chose delivery times, they generally thought they already timed these to avoid congestion, or that it would not be possible for them to receive or make deliveries outside their current opening hours.
- 11 out of 30 businesses said they were already consolidating their deliveries to reduce the number of vehicle journeys. However, nearly half of businesses thought this would not be a feasible option for them.
- Nine out of 30 businesses shared some of their suppliers with other local businesses where possible. However, many businesses didn't think this would work for them, as they thought their needs were too different from other local businesses.
- Few businesses were using electric vans to their full extent, but several were considering it or were in the process of upgrading their fleet. 21 out of 30 businesses cited cost as the main barrier, though one business expected this to change: "Transitioning to EVs is an easy decision as a lot of companies are already thinking ahead which is causing a chain reaction." Another business said that the ULEZ expansion made the shift cost-effective, but was keen to get support for transitioning to an EV.

- Many businesses said they didn't know whether cargo bikes would work for them, or said that they didn't think them suitable or cost-effective. 12 out of 30 cited cost as the main barrier.

Key survey takeaways

Overall, businesses operating locally thought air pollution was an issue, but they didn't necessarily see their own deliveries as having an impact on this. Few mentioned having written sustainability targets, and when they did, air pollution wasn't mentioned. Some businesses understood that becoming more sustainable will be part of their success, because customers themselves are demanding this. However, when it came to picking suppliers or the vehicles they use for delivering goods, most business chose based on cost and, to a lesser extent, constraints as a result of the ULEZ. Some consolidation of received deliveries is underway, but this is being driven mostly by suppliers rather than businesses as customers. Establishing a Business Improvement District in the area could make it attractive for businesses to use shared suppliers at lower prices.

In terms of vehicle choice, businesses overwhelmingly didn't own or use cargo bikes and didn't think they would be appropriate for their needs. They also found the cost of EVs prohibitive, but would be open to adopting low-emission solutions if vehicle costs were lower. The lack of availability of on-street spaces for loading and unloading was also a key issue – creating costs for businesses and generating air pollution as vehicles circle around for loading space.

Case study: Making on-street loading more reliable

UK technology firm Grid Smarter Cities is partnering with the London Borough of Southwark to pilot a dynamic kerbside management system that will make loading and deliveries more reliable in the borough.

Many businesses rely on on-street loading to operate, but may not have a nearby loading bay for convenient deliveries. However, inconsiderate loading directly from the carriageway can create congestion and danger. The pilot includes three innovations that address this problem:

- A booking system for loading bays to make deliveries more reliable.
- Virtual loading bays that can be activated in specific circumstances (for example, if a loading bay is already in use, or to meet the delivery needs of a business).
- Dynamic e-ink smart signs that change to display the current use and booking information.

The service will be funded by the London Borough of Southwark and is expected to run for two years. Delivery firms may pay a fee to use the service, but Grid Smarter Cities believes they will find this more cost-effective than the annual charge for parking tickets, and will also benefit from increased reliability of deliveries.⁴⁴ If paired with rapid charging points, advance booking guarantees electric delivery vehicles a charge point en route if they need it.

In the areas where the scheme has already been rolled out, delivery firms have experienced a 21 per cent efficiency saving in their last-mile deliveries to urban areas. This is alongside a 6.6 per cent reduction in NO_x emissions from all road transport, a 5.8 per cent reduction in PM_{2.5} emissions, and a 4.6 per cent fall in CO₂ emissions, according to research by Grid Smarter Cities. Further modelling commissioned by Grid Smarter Cities and carried out by consultancy Stantec suggests that rolling out dynamic kerbside management for loading and deliveries would reduce carbon emissions equivalent to taking 13,000 cars off London's roads. Stantec note this is equivalent to the carbon emissions reduction achieved by the introduction of the ULEZ in central London.

Crucially, dynamic kerbside management will provide local authorities with data on the demand for loading and delivery space, which can then be used to optimise kerb use. Loading bay access can be added where needed, as well as charging points for delivery vehicles, or limits on deliveries to specific times of day that allow for other uses. For instance, a restaurant might want to be able to receive deliveries safely earlier in the day before turning over the space for tables and chairs.

4. London's response



"I'm eager for London to make use of its tide – it's something that already happens, so why not utilise it?"

Head of Delivery, public trust

London is responding to the challenges, trends and opportunities facing freight through public policy and investment. But doing so is far from straightforward, and requires a sensitivity to the potential interactions between different interventions. The range of policies outlined below highlights the multiple approaches and actors needed to reduce congestion, improve air quality and shift to different modes of transport – all while ensuring that operators aren't prohibited from carrying out deliveries successfully.

London Lorry Control Scheme

The London Lorry Control Scheme (LLCS), run by London Councils, prohibits HGVs over 18 tonnes (maximum gross weight) from operating at night and at weekends on restricted roads. Since 2003, failure to comply with the scheme no longer leads to criminal charges, but it does make it expensive for drivers who need to operate within those hours, and penalty charge notices can range from £130 to £550.⁴⁵

The scheme has been important in tackling noise pollution and the environmental impacts of HGVs, but some regard it as outdated and not fit for purpose in a large city with an increasing demand for goods. A 2015 review by London Councils' Transport and Environment Committee showed that there was poor awareness and understanding of the scheme, with freight operators seeing it as a barrier to their ability to carry out core operations.⁴⁶ Some stressed that having to work out alternative routes and schedules was not only time consuming, but also led to longer journeys and therefore higher pollution and carbon emissions.⁴⁷

Congestion charge

First introduced in 2003, the congestion charge requires motor vehicles entering central London to pay a daily charge of £15. The charge reduces traffic, improves air quality and raises revenue for the city's transport infrastructure and services.⁴⁸ In the first two years following its introduction, the scheme generated net revenues of over £90m.⁴⁹ This rose to £247m in 2020, accounting for nearly five per cent of Transport for London's income.⁵⁰ Between 2003 and 2015, there was a 30 per cent reduction in the number of vehicles coming into the charging zone. However, this was mostly due to fewer privately owned cars entering the zone⁵¹, as the number of vans and privately hired cars increased significantly in the same period.

In recent years, the efficacy of the congestion charge has been questioned in light of growing freight traffic. Thinking about possible replacements, Centre for London's Roads and Streets Commission looked at the potential for a London-wide road user charging scheme that charges drivers for the distance they travel and the amount of pollution they produce.

Ultra Low Emission Zone (ULEZ)

One of the world's most radical urban policies for tackling air pollution, the ULEZ restricts older and more polluting vehicles from entering central London. As of October 2021 the ULEZ, which covered the same area as the Congestion Charge Zone, has expanded to include inner London to the North and South Circular roads. Six months after it was initially introduced, NOx emissions from road transport had fallen by 31 per cent, and the scheme achieved a high compliance rate of 79 per cent as more drivers transitioned to

vehicles meeting the ULEZ emissions standards.⁵² However, the zone makes it particularly expensive for freight operators and drivers to serve the city if they are unable to access vehicles meeting the standards. Subsidies such as the Mayor's scrappage scheme attempt to overcome this barrier by helping Londoners with microbusinesses (as well as those with low incomes or disabilities) to switch their older, more polluting cars for cleaner models.⁵³

Road access restrictions

The Mayor of London's Healthy Streets vision is one where car-dominated spaces are reallocated to public transport, active travel routes and places where Londoners can spend leisure time. In some London boroughs, such as Waltham Forest and Enfield, vehicle access restrictions have successfully reduced overall vehicle traffic levels and created more attractive public spaces for active travel.⁵⁴ Hackney has introduced Ultra Low Emission Streets, where only low-emission vehicles are allowed during morning and evening rush hours. While many residents arguably benefit from these restrictions, firms delivering to homes and businesses face additional challenges.

Electric vehicle charging

The Mayor's ambition for London to have net zero carbon emissions by 2030 requires an urgent shift from petrol and diesel vehicles to electric cars and vans. London now has close to 6,000 electric vehicle charging points, leading the way among European cities.⁵⁵ However, only about 500 of these are rapid charging points, which are particularly important for delivery drivers who need to recharge throughout the day. According to the Mayor's Electric Vehicle Infrastructure delivery plan, London will need up to 4,000 public rapid charging points – not just to meet demand, but also to make the transition to electric vehicles a viable option for those without access to private charging depots.⁵⁶

Support for businesses to consolidate deliveries

Since 2018, Transport for London has used the Healthy Streets Fund for Business to help business groups reduce freight and van traffic. The Fund has also aimed to improve air quality by setting up local consolidation hubs and using electric cargo bike schemes.⁵⁷ StreathamIN – one of the Business Improvement Districts (BIDs) that received funding – collaborated with Balfe's Bikes to run a shared e-cargo bike service for local businesses.⁵⁸ Additionally, through the Mayor's Civic Innovation Fund, Transport for London has set up the London Freight Lab, which partners with a range of businesses to trial sustainable and safe freight solutions that will reduce congestion.

Encouraging river and rail freight

Transport for London's Freight and Servicing Action Plan champions the strategic role of London's railways and water networks, given their potential for making the movement of goods more efficient and less carbon intensive. The Thames and its wharves already move large volumes of construction materials, and every 1,000-tonne barge on the river takes the equivalent of 100 lorries off the road.⁵⁹ Additionally, one freight train removes up to 76 lorries from the road, and in London there are already 32 rail freight terminals in use.⁶⁰ Together, rail and river freight in London represent around 10 per cent of goods delivery miles – but capital investment could unlock greater use of wharves, piers and railways for deliveries. There are also new light freight services such as parcel deliveries coming into central London piers and then using cargo bikes for last-mile delivery. With investment to adapt passenger piers for freight use, there is potential to scale up significantly and reduce van journeys on the road network.

Reallocation of industrial land

The London Plan 2021 recognises the importance of having enough industrial land to meet the capital's need for a booming logistics sector. Strategically placed urban logistics facilities are important for meeting the demands of last-mile delivery and reducing journey times. Additionally, making the shift to alternative modes such as river and rail will require wharves, depots and cargo handling facilities to be retained for such uses. However, London is releasing industrial land for other uses at a much faster rate than planned. These include much-needed homes for the city's growing population, and office space as the capital's economy has evolved. Between 2010 and 2015 the city released three times more industrial land than it had planned to, even as demand for logistics continued to grow.⁶¹

What consumers and businesses are doing

Consolidation

Consolidation can take different forms, but all aim to ensure that there are fewer journeys being made and fewer vehicles on London's roads. Off-site consolidation – where all deliveries reach a warehouse before being “consolidated” into single loads – can achieve huge reductions in vehicle journeys, air pollution and carbon emissions, as the examples of Guy's and St Thomas' NHS Trust and 22 Bishopsgate show (see below and in Chapter 5).

With the last mile of operations often amounting to between 30 and 50 per cent of supply chain costs,⁶² it is already in the interests of businesses to consolidate wherever possible, especially when it comes at little or no cost to consumers themselves. Urban and micro logistics hubs are drop-off points for logistics operators where goods can be sorted, consolidated into mixed loads, and then delivered (often) via cleaner and electric vehicles. When suitably located and close to end customers, these hubs can reduce costs for operators, lessen congestion and improve air quality. Finding suitable, available and affordable places is particularly challenging, requiring coordination between a number of stakeholders including landowners, operators and boroughs.⁶³

Consolidation can also occur through procurement. Several groups in a local area may agree to share the same supplier for specific goods, so that their deliveries arrive together in one journey. Transport for London's evaluation of consolidation projects in the capital found that businesses often need strong incentives to switch to preferred suppliers, and that consolidation is not suitable for those with specific supply chain needs.⁶⁴ On the other hand, waste consolidation projects in the West End and Copeland Park that allowed businesses to share the same waste company were well received, as businesses saw the benefits of being able to reduce the cost of private waste and recycling collections.

Pick up / drop off points

Pick-up and drop-off points (PUDOs) are designated shops or lockers where people can go to pick up or return deliveries typically made online. They're also an efficient and convenient option for operators to offer, as an estimated 60 per cent of untimed home deliveries end in failure and add to traffic volume by requiring redelivery.⁷² Rather than delivering to individual homes, PUDOs allow carriers to deliver large numbers of packages at once to fewer specified locations. They're also beneficial for consumers, who can pick up their parcels at more convenient times. According to research by Delivering London, 73 per cent of those they engaged found “parcel place local network” appealing, as it made dealing with returns easier. However, for PUDOs to be a worthwhile option for consumers, they have to be well located. They work best when located near the places that people live, work or spend time – such as local corner shops and local high streets. In this way, they can also play an

important role in driving footfall and creating a culture where picking up a parcel becomes part of running an errand, going to a local café, or doing a weekly shop.

Electrification

As couriers and operators set their own organisational goals for net zero carbon emissions, electrifying their vehicles has become a major part of their strategy. Large companies such as DPD, Amazon UPS and DHL are increasingly rolling out electric delivery vans, and electric-only vehicle companies such as Gnewt have run pilots with the Mayor of London demonstrating the benefits and challenges of increasing the use of large electric vans in the capital.⁷³ The cost and availability of electric vehicles remains an obstacle, especially as Brexit affects supply chains and creates a backlog of orders coming from the EU.

In particular, smaller operators and businesses face barriers to adopting electric vans, often requiring subsidies, incentives or support to do so. In Brixton, a partnership between Cross River Partnership, Lambeth Council, Brixton BID and Zipcar led to an initiative that provided small businesses with a shared electric van that could be used freely. The success of the project led to its extension, with businesses offered a discounted rate so that they could continue using the service.

A further challenge to more widespread electrification is ensuring that London's constrained energy grid can keep up with the high power demand needed for this transition. One decarbonisation expert we spoke to highlighted the excessive costs that large operators face in electrifying their depots and paying for grid upgrades.

Case study: Consolidation of deliveries to cut vehicle trips

Guy's and St Thomas' (GSTT) is one of London's largest NHS foundation trusts. Prior to the construction of its consolidation centre, it received up to 160 deliveries daily. This contributed to congestion around the hospital sites, as well as air pollution and carbon emissions.⁶⁵

In 2019 GSTT partnered with CEVA logistics to create an offsite storage and distribution facility in Dartford that consolidates the Trust's daily inbound deliveries.⁶⁶ Upon arrival in Dartford, goods are sorted and organised into efficiently distributed loads that are then delivered to the hospitals. The distribution of loads in conventional supplier-to-customer deliveries is often inefficient, with vehicles less full than they could be. By gathering deliveries offsite, there are fewer last-mile deliveries, and deliveries can wait until trucks are fuller,⁶⁷ thus reducing the number of vehicles in congested central London. This resulted in a 90 per cent reduction in GSTT inbound delivery traffic to central London, or 36,000 deliveries per year.⁶⁸

By using the consolidation centre, the Trust was also able to reclaim 1,300 sq m in the warehouse and put it to clinical use, potentially as bed space for patients.⁶⁹ The site also offers improved security for goods, as well as more efficient waste management. The consolidation centre can strip exterior cardboard packaging before sending the delivery on to the hospitals, speeding up deployment of equipment to clinical practice.⁷⁰

The GSTT scheme was successful because of stakeholder buy-in and prior consultation at all levels of the organisation. This may have been easier because the GSTT is a single entity, rather than multiple firms sharing one consolidation centre.

Following the success of the consolidation hub, GSTT again partnered with CEVA Logistics and Livett's Group to pilot a daily riverboat delivery service for a three-month period starting in June 2021. Running twice daily, five days a week, the service brings parcels loaded at Dartford International Ferry Terminal (Kent) into central London at Butler's Wharf Pier. The parcels are then transported by electric cargo bikes to Guy's Hospital. If deemed successful, the service will continue to operate at a larger scale.

Case study: The failings of Leiden's consolidation centre

In 1997 the Dutch city of Leiden opened a consolidation centre to reduce the number of heavy goods vehicles entering the city centre. The solution consisted of a large (1500 sq m) warehouse facility where incoming goods were merged onto smaller vehicles for transport into the city.⁷⁴ Five electric trucks handled the shorter journeys, while two diesel trucks were available for longer distances.

The consolidation centre was expected to reduce the total number of commercial vehicles in the city daily by 80 per cent, from 24,000 to 5,000.⁷⁵ For the facility to break even financially, it needed to handle 600 shipments a day. However, even at its peak it only handled 90 shipments a day, leading to its closure in 2000.

Contributing factors to its failure may have included the poor location of the facility – too far from the highway to receive incoming shipments quickly, yet too far from the city centre for sending goods on to their destination.⁷⁶ The additional fees involved in using the facility also meant freight firms were reluctant to use it, because their deliveries were already operating on thin margins.

The lack of stakeholder consultation meant there was little understanding on the part of the municipal authorities of the business case for the consolidation centre – or where it needed to be constructed to see widespread use. So far, successful consolidation centres (like the GSTT facility described above) have largely been implemented internally within firms – possibly because they have better knowledge of their own requirements.

5. Recommendations



To prioritise deliveries:

The Mayor of London should press ahead with plans to introduce road user charging, in order to reduce congestion on London's roads and save time and money for vehicle drivers.

The Mayor of London has set an ambition for all cars and vans in London to be electric by 2030, yet diesel van sales are at the highest level on record. On top of this, the National Infrastructure Commission has also recommended that the government ban diesel HGVs by 2040.⁷⁷

While the extension of the ULEZ is very welcome, it doesn't necessarily encourage the switch to electric vehicles, since many diesel and petrol vehicles are already compliant with the scheme standards so don't have to pay the fine. It also doesn't encourage organisations to consolidate their deliveries.

Centre for London has been making the case for London government to introduce a road user charging scheme, and details of our proposal can be [read here](#). Charges would be based on vehicle class and emissions, distance travelled, the availability of replacement electric vehicles, where a journey takes place and whether it is deemed essential. Such a scheme would allow priority to be given to delivery and servicing vehicles: for example, charging rates for HGVs could be initially lower to reflect their essential nature, and increase as electric vehicles become available.

London Councils should allow quiet deliveries to take place during evenings and the night-time.

Not all goods vehicles are as noisy as they were when the London Lorry Control Scheme (LLCS) was first introduced, nor are the methods and equipment used for unloading. Quiet goods vehicles should be allowed to operate at night so that drivers can avoid the more congested times on the capital's roads, thus reducing both journey times and air pollution. London Councils should set out standards and guidance to ensure that only quiet deliveries can operate in this way.

There is already a precedent for allowing lorries to operate during the night. During the London Olympic games in 2012, the night-time restriction on lorries was temporary suspended to allow for the delivery of goods and the collection of waste. Working with businesses and operators, London Councils should review the LLCS and planning permissions to pilot a scheme that tests different windows of operation for night-time deliveries.

Case study: Stockholm's night-time delivery pilot to reduce journey times and pollution

The city of Stockholm bans late-night deliveries between 10pm and 6am to reduce noise pollution. However, as part of a special pilot, this was lifted for six McDonald's restaurants in the city, which started receiving deliveries at night. Because the vehicles were hybrids,⁷⁸ they could drive quietly on electric power, preventing disturbances to residents.⁷⁹

Conducting deliveries at night when there is less congestion resulted in 25-30 per cent quicker journey times for firms,⁸⁰ as well as a 28 per cent reduction in particulate matter and an 80 per cent reduction in NO_x emissions.

⁸¹ This is likely to be due to the reduced time spent in traffic, as the stop-start driving associated with high-traffic areas produces more air pollution.⁸²

Deliveries in the pilot also had more reliable arrival times, with deliveries on average falling within a 15 per cent variation of their estimated time of arrival when travelling at night (compared with an average 22 per cent variation during normal hours of operation). Drivers also reported being less stressed about late deliveries.

The scheme partially continued after the pilot, with some firms involved switching portions of their fleet to hybrid vehicles and the City of Stockholm continuing to allow night-time operations. However, the scheme has not yet seen a widespread rollout, primarily because of the high initial cost of purchasing the hybrid trucks.⁸³

London boroughs and Transport for London should embrace dynamic kerb management, which would give delivery vehicles safer and more reliable access while minimising impacts on other road users.

Many businesses rely on on-street loading bays to receive or make deliveries, but have to compete with a wide range of other demands on kerb space – from vehicle traffic to car parking and even alfresco dining. In many cases delivery vehicles resort to illegal loading, facing fines as well as impacting on other road users. Introducing dynamic and digitalised kerbside management systems would enable delivery vehicles to book space on the kerb. It would also enable local authorities to prioritise loading over other uses of the kerb (such as car parking), while gathering data on where loading bays are needed and for how long.

Advance booking would offer delivery vehicles the reliability they need to operate more efficiently. It would also reduce circling for space and the associated air pollution. Flexible loading bays would allow vehicles to stop for loading where they currently cannot (for example due to other parked vehicles). They would enable local authorities to ensure that loading happens safely by regulating informal unloading that is often disruptive to other road users. Flexible loading bays also allow for multiple uses of the kerb in a single day: a space can function as a loading bay in the morning yet double up as seating space for pubs or restaurants later in the day. Finally, digital management of the kerb allows local authorities to prioritise zero-emissions vehicles over others.

Transport for London should introduce parking charges on red routes, and prioritise the need for loading bays over car parking.

On strategic road corridors such as red routes, where loading is more likely to lead to delays and congestion, Transport for London should pilot the introduction of parking charges and reservable loading bays. These would give drivers a guarantee of finding a space to load or unload without impacting on traffic flows. Advance booking of on-street loading space would also allow Transport for London to prioritise zero-emissions vehicles.

If these recommendations prove challenging within existing regulatory powers, national government should devolve further responsibilities to London's government to allow them to proceed.

To deliver to and from the right places:

The Mayor of London should work with boroughs and parcel delivery companies to ensure that 90 per cent of Londoners have a universal parcel pick-up and drop-off point within 250 metres of their home by 2025.

Most carriers offer a parcel pick-up and drop-off option, but only 17 per cent of parcels are delivered this way in London – despite pick-up options generally being cheaper than home deliveries.⁸⁴ For most Londoners, parcel pick-up isn't a convenient choice, since few have a pick-up/drop-off point (PUDO) within a short walking distance (see case study below). Developing a network of PUDOs that Londoners can easily use would encourage them to take up this option.

Working with London boroughs, parcel delivery companies, and organisations such as Delivering London, the Mayor of London should encourage the growth of an open PUDO network that all carriers can use. These could also include in-store pick-up points or lockers. Parcel delivery companies will need to ensure compatibility between their own software

and the universal locker system, so pilots will be needed to check that the integration is working.

Boosting the use of PUDOs doesn't only reduce traffic on the roads. It would also save on last-mile delivery costs and reduce the number of missed deliveries, thereby cutting unnecessary journeys. It would also hugely simplify parcel deliveries. Currently, deliveries are made to 3.5 million addresses across London, but introducing 10,000 PUDOs would put around 90 per cent of London's population within reach of one. In addition, parcel pick-up locations can increase footfall in local shops and community venues.

While rolling out universal PUDOs is in the interests of both Londoners and delivery companies, national government should ensure that the Mayor of London has the powers they need should progress be too slow:

- National government should give the Mayor of London powers to introduce an online sales tax for at-home deliveries, which could be used to encourage delivery companies to set up more pick-up/drop-off locations and encourage consumers to use them.
- The Mayor of London and local authorities should campaign to highlight the impact of non-sustainable delivery methods, while also raising awareness and take-up of sustainable delivery options.

Campaigns by the Mayor of London and local authorities should raise awareness of sustainable delivery options and aim to increase take-up of out-of-home parcel delivery solutions. Campaigns could also be directed towards businesses to promote sustainable and affordable options for receiving and making deliveries. Where Business Improvement Districts exist, local authorities should work with them to raise awareness and facilitate take-up of these options.

Local authorities should work with communities to understand how microhubs could serve their needs and deliver positive impact, while also including communities in consultation over the right locations.

Although they reduce delivery vehicle mileage at the city scale, new consolidation centres near homes tend to face opposition from residents due to their local impact on traffic and air pollution. Local authorities should engage communities near potential consolidation sites early in the planning process to understand their concerns. Additionally, they can work with planning applicants to minimise local impacts, for example by using zero-emissions vehicles. Local authorities should also ensure that planning applications and decisions take into account the geography of the area, so that hubs aren't placed close to particularly vulnerable groups such as schools and care homes.

The Mayor of London and London boroughs should ensure that space is available for logistics hubs near homes, which would allow delivery vehicles to reduce their mileage.

Just-in-time supply chains and quick deliveries are essential to many businesses, but these require retailers and carriers to be able to use warehouses near their customers. Where operators lack facilities to consolidate their deliveries, vans need to deliver over longer distances. A shortage of industrial land in London, particularly in the inner city, means that very few suitable spaces are available.

Local authorities, guided by the London Plan, should continue to protect logistics land across London. They should also work with delivery companies to find out where land for logistics hubs is most needed, so that

Case study: Making parcel pick-up quick and easy

Nearly all parcel delivery companies offer “out of home” parcel pick-up and drop-off options (PUDOs) – yet these are far less popular in the UK than in other European countries, according to research conducted by Delivering London.

In theory, London’s density should mean that most people can walk a short distance to pick up or drop off their parcels, but this is not the case in practice. Different parcel delivery companies use different PUDO networks, so consumers have to find out which pick-up point works for their specific delivery. This also limits choice, as the carrier for the parcel in question may not have a partnership with the nearest pick-up point. According to modelling conducted by Delivering London in one outer London borough, none of the PUDO networks had more than eight per cent of the borough’s population within 250 metres of their PUDO points, and only 21 per cent of residents had a PUDO point within 250 metres of their home.

Delivering London is working with London government and parcel delivery companies to create a single open network of PUDO points that all carriers can use by 2025. Delivering London estimates that increasing the share of deliveries fulfilled using PUDOs from 17 per cent currently to 50 per cent would generate carbon savings equivalent to electrifying 20 per cent of London’s delivery fleet.

they can adequately support applications for new premises near residential areas. In neighbourhoods where consolidation premises are needed but no applications are coming forward, local authorities should consider using their compulsory purchase powers to facilitate the creation of logistics hubs. Centre for London’s upcoming Industrial Land Commission report will offer detail on how local authorities can ensure that the city has sufficient industrial land to reach net zero targets.

To deliver in the right way:

To accelerate the shift to electric vehicles, national government should fund upgrades to power distribution networks, as well as charging facilities in private and commercial premises such as depots.

At the end of 2020 there were 500 rapid charging points in London, but forecasts suggest at least 4,000 will be needed by 2025.⁸⁵ Plans are in place to deliver the charging points needed, but these will need to be accelerated to meet demand. Charging points are also needed at depots and consolidation centres, but the cost of installing them (and the electric power distribution networks required) is currently prohibitive. It’s therefore crucial that national and London government boost delivery with additional funding.

To reduce van and lorry journeys on key London roads, national government and the Port of London Authority should invest in the redevelopment of London’s piers, wharves and rail-road interchanges.

London has safeguarded wharves and piers in strategic locations to boost use of the river Thames for deliveries. But without investment in contemporary logistics spaces and road interchanges, most of these sites remain underused. National government should offer financial backing for projects that would reduce carbon emissions from deliveries, including projects that increase the use of the wharves, piers and railways.

Space near railway stations is more constrained, but Transport for London and Network Rail should identify the rail-road interchange sites with the most potential to reduce carbon emissions if redeveloped, and put forward the business case for government investment.

While trains and ships can carry bigger loads than lorry journeys, they run on diesel, which impacts on local air pollution. Train and boat fleets in London should electrify. To incentivise this, public investment in river and rail freight infrastructure should be assorted with targets for the electrification of boat and train fleets.

To consolidate deliveries:

National government should give local authorities the power to require the consolidation of all commercial deliveries into designated areas, such as certain high streets. This would reduce congestion and pollution, and would improve high streets for residents and visitors.

Consolidation of deliveries can achieve huge reductions in delivery vehicle traffic. For example, the Crown Estate's delivery consolidation scheme for Regent Street retailers has enabled an 80 per cent reduction in the lorry movements they generate.⁸⁶ Many London high streets would benefit from similar group consolidation schemes.

If national government is unwilling:

Business Improvement Districts should negotiate framework procurement contracts so that their members can use common suppliers at cheaper prices.

Commercial landlords should require tenants to use the same suppliers for common services such as waste collection.

Businesses in an area often use a variety of providers for common services such as waste collection, which leads to unnecessary vehicle journeys, pollution and carbon emissions. To mitigate this, BID's should negotiate framework procurement contracts so that they can offer businesses a shortlist of cheaper suppliers to pick from.

It's also common for commercial leases to include specific requirements on deliveries, such as the times at which they can take place. To avoid doubling up on vehicle movements, commercial landlords should require their tenants to use shared suppliers.

Local authorities should require all large developments in opportunity areas to use a construction consolidation centre, and make this a requirement of planning permission.

It is common for local authorities to require the consolidation of construction materials and waste. The Olympic site construction consolidation site was an example of this working at scale. This practice should be the norm for all large new development projects in opportunity areas, where it is likely that other developments will be taking place at the same time.

Local authorities should make delivery consolidation a requirement in planning applications for all new major developments.

Case study: Compulsory off-site consolidation

Local authorities can require off-site consolidation of deliveries once a building is in use. The City of London Corporation has introduced this requirement for all new major commercial developments in the Square Mile through Section 106 agreements. At the time of writing, it has required off-site consolidation of deliveries in over 20 developments, which will lead to huge reductions in vehicle journeys in the City and across London.

For example, off-site consolidation for 22 Bishopsgate – London’s largest office building to date – is estimated to reduce emissions from deliveries by 96 per cent.⁸⁷ The City of London Corporation hopes to expand this requirement to smaller developments as delivery consolidation services become more widely available. Planning applicants are required to submit evidence that they have subscribed to an off-site consolidation service, and produce annual reports on the number of deliveries to the building.

Appendix:

Deep dive study area

The case study area encompasses the section of the Old Kent Road stretching from Bricklayers Arms to the road's junction with the A202, and includes all trips made within a one-mile radius of the Old Kent Road. The analysis of vehicle trips was conducted by Environmental Defense Fund Europe using data procured from INRIX; this data is a sample of all heavy-duty vehicles that travelled on this section of the road during the week of September 9 to 15 2019.

Case study area

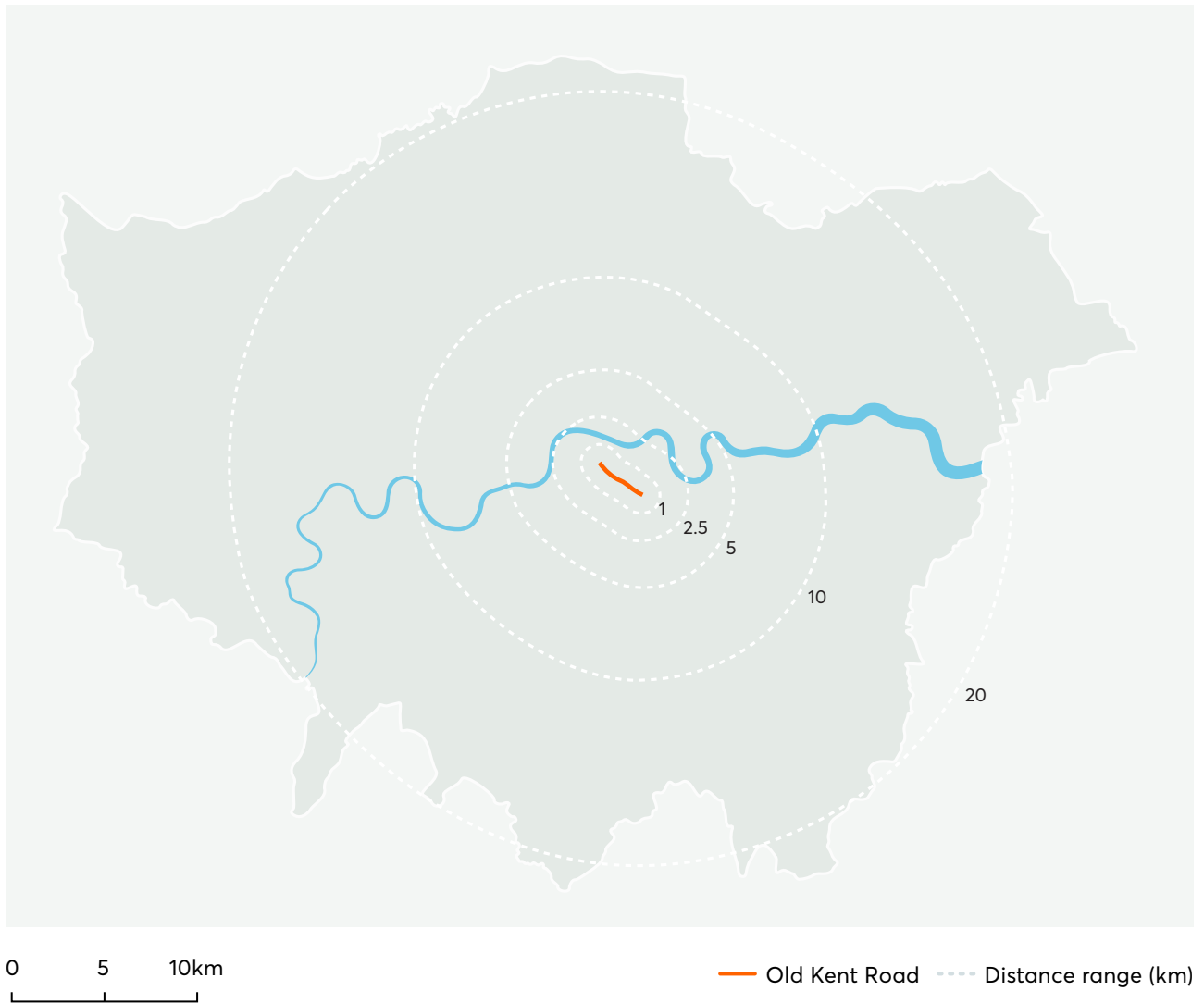


Figure 12: Heavy duty vehicle trip typologies

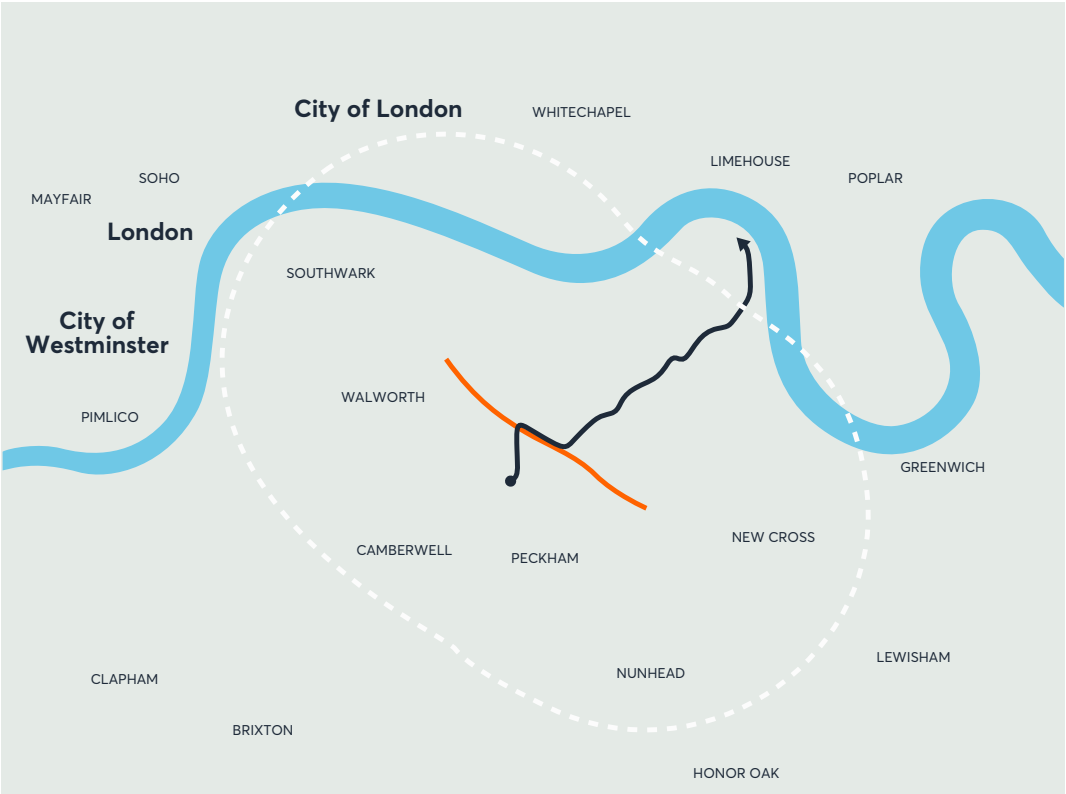
Local to local



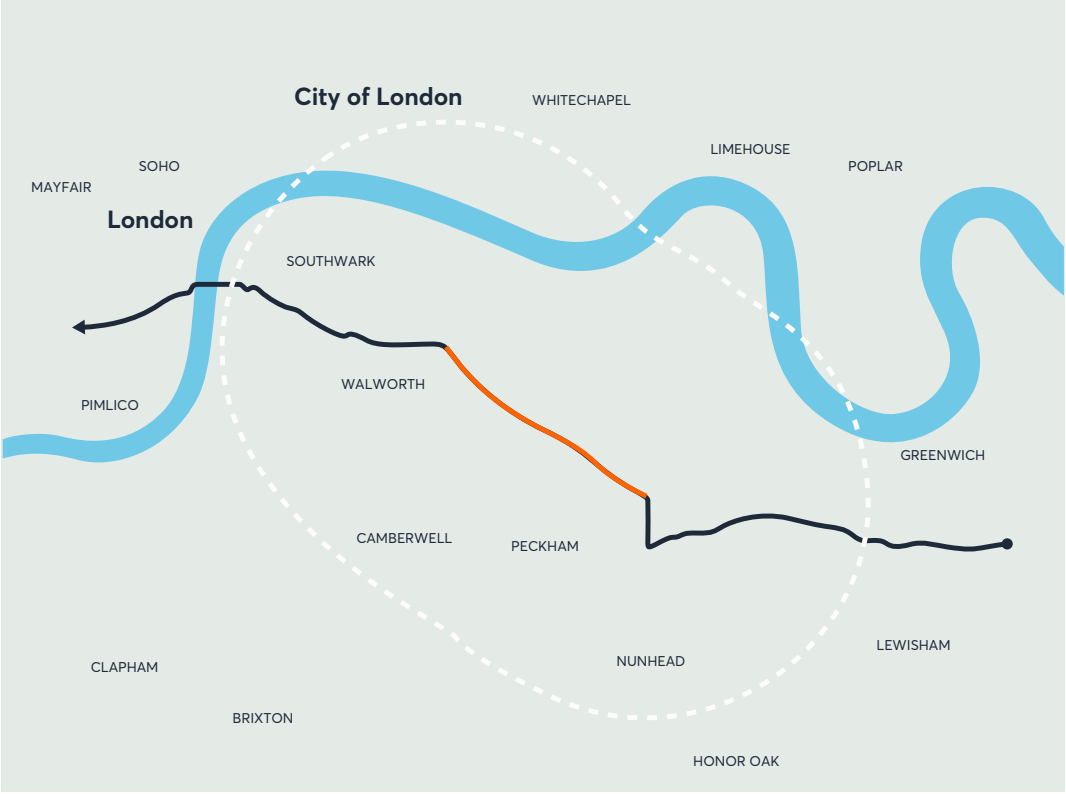
External to local



Local to external

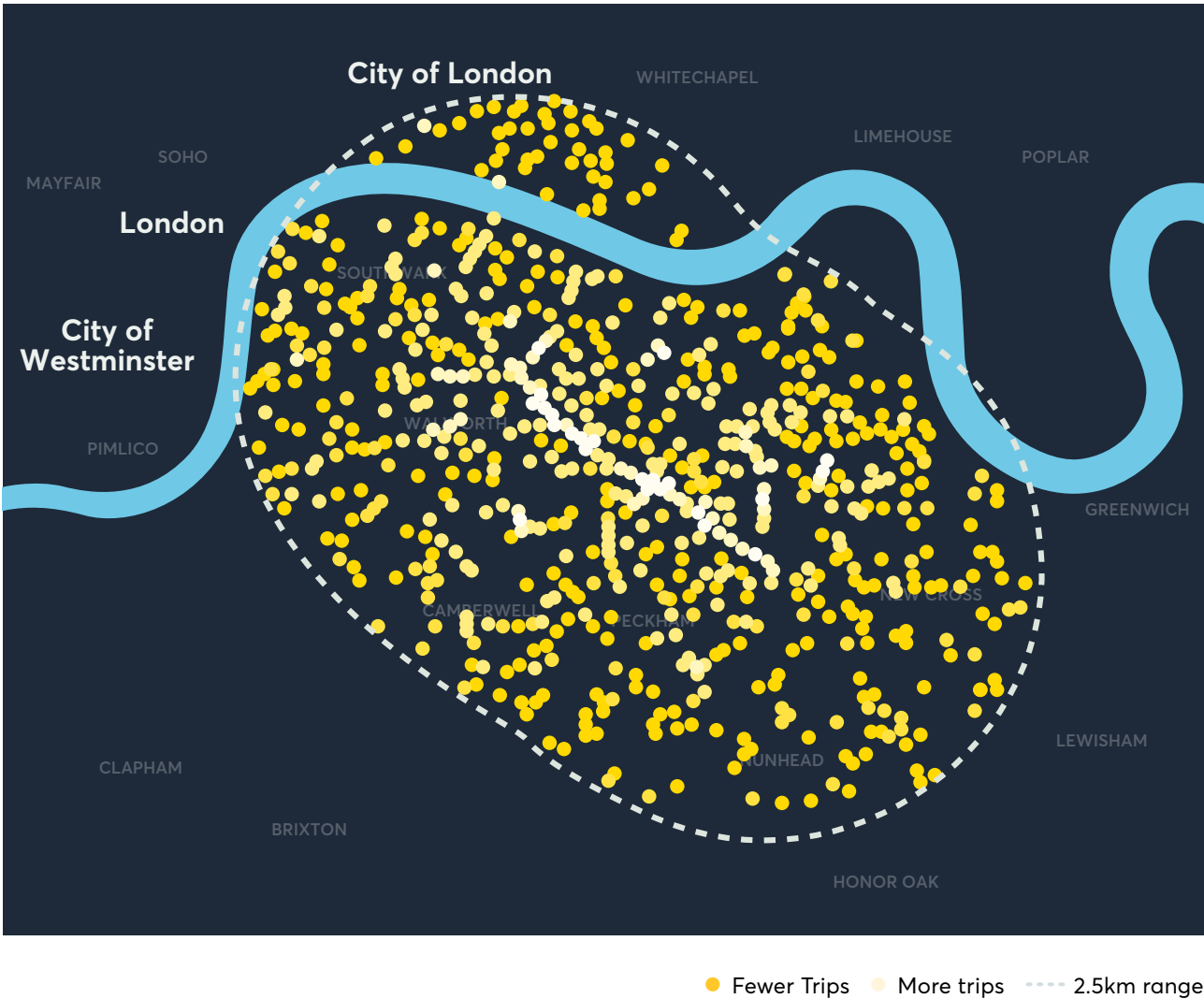


External to external



— Old Kent Road — Vehicle trip - - - 2.5km range

Figure 13: Heatmap illustrating destinations and origins of local to local trips



Endnotes

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32 - 33 Hatton Garden
London, EC1N 8DL
T: 020 3757 5555
hello@centreforlondon.org
centreforlondon.org
Company Number: 8414909
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