Rail Freight In London Feasibility study

Department for Environment Food & Rural Affairs

momentum





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Cross River Partnership

Cross River Partnership (CRP) is a partnership delivering environmental, economic and community focused projects. We support public, private and voluntary organisations to address creatively challenges around Air Quality, Transport, Placemaking and Wellbeing. CRP's vision is to address sustainability challenges collaboratively in London and beyond. As a testbed for exciting projects in towns and cities, we will share knowledge, evidence, and best practice for the people who live, work and visit these places. All of CRP's partners are represented on its Board. CRP is proud to be working collaboratively with all these public, private and community partners across central London and beyond.

CRP is an alliance of:

- Angel London
- Better Bankside BID
- Brixton BID
- Cadogan
- Camden Town Unlimited BID
- Cheapside Business Alliance
- City of London Corporation
- Eastern City Partnership
- Euston Town BID
- Greater London Authority
- Groundwork London
- Hammersmith BID
- Hatton Garden BID
- London & Partners
- London Borough of Camden
- London Borough of Hammersmith and Fulham
- London Borough of Islington
- London Borough of Lambeth

- London Borough of Southwark
- Central District Alliance
- Network Rail
- Port of London Authority
- Royal Borough of Kensington and Chelsea
- South Bank BID
- Team London Bridge
- The Fitzrovia Partnership
- The Northbank BID
- Transport for London
- Westminster City Council
- Victoria BID
- Vauxhall One

CRP's Clean Air Villages 4 (CAV4) project is a Department for Environment, Food and Rural Affairs (Defra) funded project led by Westminster City Council. CRP is working with 26 project partners to improve air quality across different London 'villages', where both air pollution and population density levels are high. These locations reflect the Greater London Authority's Air Quality Focus Areas. The CAV4 freight solutions implemented incorporate Consolidation, Distribution, Mode, Technology and Policy.



Delivering London's Future Together



Momentum Transport Consultancy

Momentum is an integrated transport consultancy. It brings together progressive, knowledgeable thinkers in planning, analytics and engineering. Momentum's aim is that communities benefit from its strategies and the recommendations it make. It works closely with clients and industry partners – from architects, planners and property associations to developers and local authorities – to create forward-looking solutions that address the needs of the future city.

People are always at the centre of Momentum's work. Everything it does is carefully and diligently designed by its team of engineers, designers and analysts to create transport solutions that inform and integrate with every aspect of the built environment today and for the future. Momentum considers the way the world moves – on foot, bus, train, car or plane – to deliver a compelling future for its clients.





Executive Summary

This study identifies key barriers and opportunities for the development of a rail freight network in London, to support the integration of rail freight within supply chains and logistics.

As road freight disproportionately contributes to air quality, road safety and congestion issues in cities, a reconfiguration of the current freight model has been identified as a key strategy to tackle these issues.

This responds to macro trends towards improving air quality, addressing climate change and rebalancing the way that road and kerb space is used to better cater to pedestrians, cyclists and other vulnerable road users. Consumers are increasingly looking to ensure a sustainable supply chain for goods they use; policy makers are looking to discourage anything other than essential vehicle trips, especially in central London; the rail industry is increasingly open-minded towards alternative revenue streams; freight operators are keen to stay abreast of policies which make road-based deliveries increasingly costly in central London, and to improve the sustainability of their operation to respond to consumer demand.

Rail freight is here investigated as a potential way forward for an alternative supply chain for the delivery of some goods into central London. Through a review of rail freight trials and interviews with key stakeholders, this study identifies the key barriers and opportunities to a wider adoption of rail freight for light goods in central London.

The freight supply chain was investigated and mapped to identify where change would be needed to integrate rail freight. This has included both structural and operational components of the freight supply chain.

Case studies have been studied to establish precedent for rail freight in urban areas and for different types of goods.

Interviews have been undertaken with a cross-section of stakeholders to establish the key opportunities and barriers to the uptake of rail freight in central London.

Central London stations have been subject to analysis to identify their walking and cargo bike catchments, and the density of different land uses within these areas, to create a level of potential for each station.

The report finds that there is appetite across the stakeholder spectrum for alternative and more sustainable freight models in central London. Whilst businesses do want a sustainable supply chain, some coordination would be beneficial as they may not have the capacity to each research and support alternative supply chains. For operators, low operating margins and the potential cost of changes to an established supply chain are the key barriers.

This report presents a series of recommendations for the short and long term establishment of light rail freight in central London:

- A coordinated rail freight forum to bring together the key players across the rail industry, freight operators, local, regional and national policymakers, and business voices
- A long-term collaborative trial involving more than one freight operator working together with Network Rail, Transport for London, the local authority, and Business Improvement Districts
- The adaptation of goods bags to enable them to sit safely on train seats and to maximise the capacity of repurposed passenger train carriages for light freight
- The longer-term redesign of train carriages to bring seats onto rails, enabling them to easily be stacked into one side of a carriage and maximise space for roll cages within certain carriages



01. Introduction

Context

This feasibility study was prepared by Momentum Transport Consultancy on behalf of the Cross River Partnership (CRP), as part of the Clean Air Villages 4 (CAV4) Defra-funded project. It identifies key barriers and opportunities for the development of a rail freight network in London, to support the integration of rail freight within supply chains and logistics.

Clean Air Villages Project

Clean Air Villages 4 (CAV4) is a Defra funded project led by Westminster City Council in collaboration with 26 project partners to improve the air quality across different London 'villages', where both air pollution and population density levels are high. CAV4 aims to deliver ambitious Freight Solutions for a Clean Air business recovery from COVID-19, and the Freight Solutions implemented will incorporate Consolidation, Distribution, Mode, Technology and Policy elements, trialled across different 'villages'.

Rail freight refers to the carriage of goods on tracks with an origin and a destination. Rail freight can refer to the following as defined in the <u>Understanding the UK Freight Transport System</u> evidence review¹:

- Bulk rail freight: where freight is carried in railway wagons designed specifically for carrying particular types of bulk freight (e.g coal and chemicals) and requires special facilities to transfer the freight between rail and storage.
- Non-bulk rail freight carried in units (usually a container) on an intermodal rail freight service or in railway 'box cars' or vans; between specialist terminal facilities.

Road freight disproportionately contributes to air quality, road safety and congestion issues in cities. A reconfiguration of the current freight model has been identified as a key strategy to tackle these issues, notably through the development of rail freight. Transport for London (TfL)'s London Rail Freight Strategy published in May 2021 reported that CO2 emissions per tonne of goods delivered by rail are 76% lower than by road². This presents a real potential for more sustainable freight and has been identified in national and local policy documents.

Defra's 2019 Clean Air Strategy sets out plans for tacking air pollution and improving air quality across the UK, particularly in towns and cities. As further actions are required to reduce freight emissions, Defra supports research, including this study, to develop and deploy cost-effective options for shifting more freight from road to rail, including low emission rail freight for delivery into urban areas with zero emission last mile deliveries.

This approach is supported by local strategies and policies, including the <u>Mayor's Transport Strategy</u> (2018) which aims to reduce the number of lorries and vans entering central London in the morning peak by 10% by 2026. The Strategy aims to encourage a greater use of rail freight in London, though identifying opportunities for capacity and capability enhancements where freight will not impact existing and future passenger services.

As part of Network Rail's investment programme, all rail lines in London are also set to be electrified by 2050, which will further improve the sustainability of rail networks. There is an opportunity for rail freight to be developed to support a sustainable reconfiguration of supply chains.





01. Introduction

This study

This study seeks to support the expansion of rail freight networks through identifying key opportunities and barriers for rail freight at each step of the existing supply chains. This will inform organisations and businesses, and enable them to utilise rail as part of their supply chains.

Data Collection

To inform the study, UK-based trials were revied and interviews undertaken with the following major stakeholders, from both the supply and demand side of rail and freight:

- Network Rail
- Transport for London
- The Victoria Business Improvement District (BID)
- Camden Town Unlimited
- A large confidential logistics supplier

Key requirements

Rail freight will need to align with the needs of retailers, suppliers and logistics suppliers, along with the needs of Train Operating Companies (TOCs) and railway operators. The key following operational and infrastructural requirements were identified as a basis for this study to ensure that needs of both the supply and demand sides are taken into consideration:

Limiting the impact on rail timetabling

Passenger services remain the priority on the rail network. Both their safety and effective operation must be preserved. For this purpose, this study focuses on rail terminus stations, where less conflicts are likely to arise between passenger services and freight as trains are held at the station for longer periods of time.

Goods requirements

The compatibility of different types of goods and rail freight needs to be assessed, and rail freight needs to be introduced where it is likely to be most commercially viable and beneficial to customers. This requires the creation of a typology of goods and an assessment of their storage and delivery requirements.

Containers

As infrastructure is currently not provided for rail freight, container and infrastructural adaptations might be needed to accommodate goods requirements, both in the short and long term. Both freight trains and passenger trains adaptations have been considered.

Data sources

To inform the assessment of rail freight, we have sought inspiration from a variety of freight model and strategies:

- River freight: DHL service; Walbrook Wharf for City of London Corporation waste
- Construction-specific rail and river freight
- Cargo planes







Trials and rail freight case studies have been reviewed both in the UK and internationally to inform the study. Case studies provide useful insights into the operational running of rail freight and are a useful starting point to identify barriers and opportunities.

The following case studies have informed the questions set for the interviewees, and provided an initial understanding of barriers and opportunities to rail freight. They present different scale of operations, from very small parcel deliveries from London to Cambridge to a more significant operation delivered in the suburbs of Paris. The case studies have been selected to focus on more urban forms of rail freight, and they have generally focussed on light freight for this reason.

Some of the trials presented are no longer in operation and will not have benefited from the current opportunities brought by a reduction in trains occupancy, technological progress and a new policy context. However, they show that there is a long-term interest for rail freight, with innovative solutions and approach for various scales of freight and a real opportunity to develop resilient rail freight business models.

For each of the case studies, key characteristics have been identified:

- Station chosen for the final delivery
- Container and wider infrastructural adaptation
- Type and volume of goods delivered
- Last mile delivery strategy

For the volume of goods delivered, three scales were used which correspond to the below volumes:

• Small: Below 15 kg. Freight that can be carried by one person by hand and easily stored in one compartment of a carriage. Examples: letters, small packages, small amount of food.

Max of 15kg 1 to 2 sqm requirement Carried by foot



 Medium: 15kg to 600 kg. On the road, this would typically be moved by one van and be in the upper range of 600kg. This would require half of a carriage to be freed. It can be transferred to two cargo bikes, able to carry 300kg each. Average carriage area – 45sqm



Large: Above 600kg. Full train carriage or several train carriages. This would be carried in Heavy Goods Vehicles. It would require a higher number of cargo bikes, or Electric vans for transfer to the final destination.





Orion High Speed Logistics, GB Railfreight (**GBRf**): Old commuter trains to express deliver parcels.

Context

Orion High Speed Logistics is the parcels and light loads division of Rail Operations Group. The company aims to provide regular services throughout the day from/to London, Glasgow, Bristol, Daventry International Rail Freight Terminal (DIRFT) and logistics hubs.

The company states that they are receiving increased interests from customers and launched a customer trial in November 2021, aiming to put in place permanent operations.

Customers are able to enter their delivery origin and destination using an online platform, which then suggests a suitable delivery plan. A space is then booked for customers on the Orion train. Goods would be collected and arrive to the passenger station or freight hub by lorry / autonomous vehicles and be loaded into the Orion trains.

Operations:

- Date: 2021
- Destination: London Euston Station.
- Container adaptation: The adaptation was permanent. The interior of the train was stripped of seats and fitted with metal floors and equipment to hold wheeled cages full of retailer's stock.
- Type of goods: parcels
- Volume: Large once the seats are removed. While no official information has been provided on the volumes currently being carried, the train has a capacity of four carriages, which can each accommodate several cages and pallets.
- Last mile delivery strategy: Cages hauled out of the station and into Central London on bikes powered by a mixture of human and battery power. The operations are shown in Figure 1, Figure 2, and Figure 3.



Figure 1: Cages are rolled out of the train



Figure 2: Cages are fastened to wheels



Figure 3: This is then fastened to the cargo bike

Learnings

The following opportunities have been identified through the case study:

- Increased competitiveness of rail freight: Growing interest for rail freight due to increased constraints on road freight (fuel cost, drivers shortage, cost of London's Ultra Low Emissions Zone) and the comparative advantage of rail freight (access to city centres, new trains can outpace trucks)
- Light logistics/ non-bulk logistics: The focus on light logistics allows the use of a booking system for customer with flexibility and reduced parcels volumes. Storage requirements are also less constraining.
- Converted passenger trains: this ensure that trains are adapted to existing train stations platforms.
- Containers adapted to both trains and cargo bikes: easily transferable from one mode of transport to the next, efficient integration with the last mile delivery.

Challenges faced by Orion however include:

 Finding sufficient traffic / volume of goods to move to make the service economically viable in both directions



Keltic Seafare, Menzies/APC: Seafood carried overnight on the Caledonian Sleeper

Context

The Caledonian Sleeper train carries live Keltic Seafare seafood from Scotland. The service is used on Monday and Friday nights, and onward deliveries are made the following morning by road to restaurants in London.

Operations:

- Date: Running
- Destination: London Euston.
- Container adaptation: Carried within the sleeper overnight train between Inverness and London Euston.
- Type of goods: Seafood.
- Volume: Small. The seafood is expected to fit into a locked compartment of the train.
- Last mile delivery strategy: Van delivery

Learnings:

This case study shows the following opportunity:

 High value and time sensitive goods are suitable for rail freight. Advantage of early -morning ¬delivery of relatively small volumes to a range of locations in the centre of -London.



Intercity Rail freight (ICRF) and East Midlands Trains (EMT) (UK): Rail transport as a means of delivering fast, 125mph delivery network

Context

ICRF is a logistics business that specialises in the use of rail transport as a means of delivering fast, cost effective and sustainable supply chains.

Operations

- Date: Started as a trial in 2010 and expanded in 2011
- Destination: Initially London St Pancras International. To ensure that passenger disruption was avoided, no intermediate stations were served initially, and services were operated by only one type of train on the route.
- Container adaptation: None. Goods are stored within secure compartments of the High-Speed trains. ICRF now has access to over 100 x 125mph daily rail services across the East Midlands, Great Western and Cross-Country franchise networks
- **Type of goods:** Time sensitive ambient and temperaturecontrolled good, medical samples and treatments. Suppliers hire the services of ICRF for their long-distance deliveries.
- Volume: Small to medium. One secured compartment of highspeed trains.
- Last mile delivery strategy: Door to door service is provided through the integration of first and last mile courier operation. This includes electric vehicles and cargo bikes.



Figure 4: Intercity Rail Freight

Learnings

The following opportunities are identified:

- Sensitive ambient and temperature-controlled compartment: goods with temperature requirements can be stored
- Train terminals: Only train terminals are served and no intermediate station, this provides more loading and unloading time. Freight is well integrated with passenger services.

Constraints are:

- Conflict between the standard of passenger service and the quality of service for deliveries, where improving one is to the detriment of the other. This led to a reduced number of deliveries and destinations served by the ICRF.
- Use of secured compartment: as there is no container adaptation, there is a reduced potential for large cages to be loaded into the train and being compatible with cargo bikes. Transfer from train to cargo bike is therefore more time consuming.



Samada, logistics subsidiary of Monoprix, France: Warehouses sided by trains tracks for deliveries to Paris city centre

Context:

A rail freight service was put in place after extensive consultation and feasibility studies, to reduce the impact of vehicles. It was initiated by Monoprix, a French retail group owning 300 shops. Samada, the inhouse logistics provider, operated the deliveries.

Operations:

- **Date:** Operations started in 2007 and stopped in 2017 to be replaced by vehicle deliveries.
- **Destination:** Logistics centre in Bercy Station in Paris.
- Infrastructural and container adaptation: Rail tracks run adjacent to warehouses located in the Parisian suburbs, which allows direct loading onto carriages. Pallets are loaded onto a rail service, running each day from Monday to Friday on line D of the RER (French regional trains to Paris). Infrastructure connections had to be built between the warehouses and the railway network and an agreement was needed with the SNCF (French national railways) for the shuttle service and for the use of 3,700sqm of platforms in Bercy.
- **Type of goods:** Deliveries to Monoprix (food and drinks, clothing).
- Volume: Large. Trains of 16-18 wagons, 30% of the Monoprix total delivery flows (120,000 tonnes or 210,000 pallets a year)
- Last mile delivery strategy: Natural gas vehicles.

Learnings

The following opportunities are identified:

Where space is available in the suburbs, there was an opportunity to locate warehouses adjacent to railway tracks

The challenges were:

- Competitiveness of the road network against the high costs of rail. Running costs were higher than expected due to the small distance covered by rail from the Parisian suburbs. Rail freight can become advantageous when the train travel around 800-1000 km³. Costs were estimated to be 12% higher than for road freight operations. This was largely due to the time lost during the unloading of the train and loading of trucks in Paris, which took place at two different times.
- Lack of flexibility of the rail infrastructure. The rail operator required Monoprix to rent 22 carriages, whereas Monoprix could only fill 17 most of the time. Monoprix also had to pay an annual fee for the daily use of the carriages, even though these were not used everyday.
- Higher economies of scale were needed: Monoprix had high frequencies of deliveries which meant it could not use rail to carry part of their Parisian deliveries. All shops also needed to be delivered within the same time period, which excluded shops located further away from the station.
- Large infrastructure requirement and associated costs
- The requirement of a suitable inner city rail terminal was critical to the launch of the initiative, which limits the generalisation of the model
- Residents complained about noise nuisances during loading and unloading operation



Sainsbury, Colas Rail and TNT test express rail logistics, UK

Context

Several trials have been operated by Colas Rail in partnership with Eddie Stobart/Sainsbury's and TNT Urban Logistics, using converted rolling stock to carry supermarket roll cages and pallets from central rail connected warehousing direct to Euston station.

Operations

- Date: 2021.
- Destination: London Euston Station.
- **Container adaptation:** The rolling stock (Motorail NVA wagons) was adapted. Colas Rail modified the former wagons by fitting the carriages with their own lighting and power supply allowing the carriage of goods at both ambient and controlled temperatures. Built-in strapping allowing for securing loading, meaning the wagons could carry a wider variety of goods.
- **Type of goods:** Cages, pallets, clothing and garments.
- Volume: Large, full converted train capacity.
- Last mile delivery strategy: Cages hauled out of the station and then distributed into Central London on bikes powered by a mixture of human and battery power.



Figure 5: Sainsbury, Colas Rail and TNT test express rail logistics



Figure 6: Sainsbury, Colas Rail and TNT test express rail logistics

Learnings

The following opportunities are identified:

- Converted passenger trains, adapted to deliver easily on platforms
- Allowed for greater same-day coverage from central warehouses, with faster transit times
- Capacity for large retailers and a wide variety of goods

Challenges include:

 Use of a full train meant that there was less track capacity available as passenger trains have the priority – competition for rail slots prioritises passenger services. As large economies of scale are needed to make rail freight viable, this threatens the viability of the rail freight model.



Xen Courier

Context

Xen Courier is a delivery company based in Manchester providing dedicated services to legal customers. Packages delivered are generally small enough to be carried by a person on the train. Deliveries are made by the one person boarding the train and delivering the parcel.

Operations

- Date: Ongoing.
- Destination: London.
- **Container adaptation:** None. Use of passenger trains. For larger packages, the company uses cycle trailers, preloaded and then loaded on the train.
- Type of goods: Light goods. Important deeds, contracts and other legal documents. Packages small enough to be carried by a person.
- Volume: Small. Parcels carried by one person.
- Last mile delivery strategy: Cycle courier.

Learnings

There is an opportunity for smaller and time sensitive goods to be carried by trains.

Challenges include ensuring the security of parcels as these do not seem to be stored in secure compartments.



Key Learnings

Trials and case studies show a renewed interest for rail freight to carry goods after almost two decades of freight being largely moved on roads. This is particularly the case for light logistics and non-bulk freight.

The Monoprix case study shows well how road freight has offered a competitive advantage to logistics operators to move goods, with greater flexibility and lower infrastructural requirements – as well as lower costs. Despite the considerable effort, financial investment and infrastructure developed, rail freight operations were abandoned to return to road freight.

However, logistics suppliers and rail operators have been showing an increased interest for rail freight in recent years, through the multiplication of trials and investment in permanent infrastructure and reconverted passenger trains.

Orion High Speed logistics is a good example of a logistics supplier developing permanent infrastructure to deliver goods via rail directly to city centres. Each mode of transport is integrated into the infrastructure, with containers being adapted to be towed by cargo bikes for the last mile part of the journey. The logistics supplier, similarly to other trials, focuses on light logistics.

Orion High Speed Logistics' is expected to be followed by other entrants in the light rail freight logistics market. The Varamis Rail start up notably intends to launch its service in the near future to carry high volumes of parcels at high-speed on the rail network. The key following trends have been observed based on the desktop review of case studies and trials:

- There is a significant challenge in the comparative advantage of road freight over rail: Some trials abandoned as road freight was a more flexible and less expensive option.
- Portions of passenger trains are increasingly being used to carry freight, where carriages are fitted out to accommodate freight stored in secured separated compartments and cages. Adaptions have been made to the carriages to enable easy transfer onto stations' platforms and cages adapted to be towed by cargo bikes.
- Passenger services remain the priority on the rail network. Freight services have to fit in with passenger timetables and have to avoid disrupting passenger services.
- There is a focus on light logistics: Medium to small volumes of deliveries are more often included in trials. This includes high value and time sensitive goods which can benefit from fixed and regular rail services.



03.

Interviews



Interviews were undertaken with key stakeholders to identify the key barriers and opportunities for rail freight. Interviews provide an opportunity to hear in-depth from various stakeholders who are currently working in relevant sectors of rail, freight or/and policy, and enable the drawing of experience from key actors.

Our interviewees were selected deliberately to reflect a range of stakeholders who are either directly or indirectly involved in the introduction and operation of rail freight in London. They all are working in central London-focussing roles and sit across positions in policy, freight operation, rail property and Business Improvement Districts involving rail station design coordination and tenant coordination

To achieve this, we spoke with:

- Network Rail Kevin McGinley, Principal Development Manager
- Transport for London Scott Wilding, Principal Strategy Planner . for the Freight Delivery team
- A logistics operator, Senior managing position for road freight
- Georgie Street , Head of Projects
- Victoria Business Improvement District David Beamont, the wider roll-out of rail freight. Placemaking Project Manager

Network Rail owns, repairs and develops England, Scotland and in engaging for this study. Wales's rail infrastructure as a public body working at 'arm's length' from the Department for Transport. It also owns 2,500 stations nationwide including many of the London terminus stations. Network Rail does not own the passenger or commercial rolling stock which run on its tracks, and these are operated by Train Operating Companies (TOCs).

Transport for London is the strategic transport body in London with responsibilities for not only a very significant public transport portfolio, but also many stations and the Strategic Road Network. TfL does not own or operate the rail track or key rail stations, but its policy interventions on behalf of the Mayor materially impact on freight operation and development planning regarding logistics for each development plot.

Camden Town Unlimited is the Business Improvement District for Camden Town, bringing together local members for the betterment of the area, including overseeing public realm projects such as Camden Highline and delivering on £6.3 million of funding over 10 years for streetscape improvements.

Victoria BID is the business funding body supporting economic growth in Victoria and creating a vibrant destination for people working, living in or visiting Victoria.

The interviews were held remotely and were left relatively open so as to explore best the expertise that each interviewee had. The interviews Camden Town Unlimited - Roisin Morrison, Project Officer and all centred on the key opportunities for rail freight, questions around the appetite of stakeholders for introducing rail freight, and the barriers to

We are very grateful to all of our participants for their time and generosity



Findings from the interviews are split out by key theme identified across all of the interviews.

Overall, the interviews were highly engaging, demonstrating a cross-stakeholder interest in improving the use of the rail network for light freight in central London. The interviewees did, though, express concerns centring on cost, the challenge of collaboration, and resilience.

Pull factors - Sustainability

A key factor in making rail freight a more attractive operation and means of receiving deliveries for all stakeholders was the heightened focus on sustainability.

This was noted by both the BIDs in interviews that sustainability is a major focus item for occupiers in London, who are now looking into their supply chains for deliveries to ensure they are as climate-friendly as possible.

For Network Rail, especially working on the Future Victoria masterplan for Victoria Station, Westminster Council's declaration of a Climate Emergency has helped to provide the justification for introducing sustainable freight models. Likewise, in order to secure funding from the Department for Transport, strong sustainability credentials are needed for projects, and in the scenario of a marginal business case decision, sustainability credentials could tip the scales.

Passenger numbers and light freight on passenger trains

Another factor that was discussed amongst a majority of interviewees is the effect that the reduction in passenger numbers may have on opportunities for freight into central London by rail.

According to the Office for Road and Rail⁴, there were 275 million rail passenger journeys in Great Britain in the latest quarter (1st January 2022 to 31st March 2022), equating to 62.1% of the 443 million journeys in the equivalent period in 2019.

SW (TfL) noted that passenger demand is not expected by TfL to return to pre-pandemic levels for a number of years, if at all, and this may introduce capacity on passenger trains that could be used by light freight.

Furthermore, Train Operating Companies which make their revenue from passenger fares may find an opportunity to diversify this with the introduction of light rail freight onto the rail network. KM (Network Rail) noted that the TOCs are highly geared towards passengers, but the establishment of Great British Railways in 2023 is likely to enable more holistic thinking regarding revenue streams and the use of the rail network.

KM (Network Rail) agreed with the TfL sentiment regarding the opportunity related to passenger numbers being lower since the pandemic, and noted that with the retention of working from home, there may be opportunities moving forward. Likewise, the diversification of revenue streams was noted as key; *'there is an opportunity for a new and reimagined use of the railway'* (KM, Network Rail).

Figure 1: Rail passenger journeys, Great Britain, quarterly data, April 2017 to March 2022



Passenger journeys by operator, April 2021 to March 2022, and as a percentage of April 2019 to March 2020 (Table 1223)



Passenger rail usage January to March 2022



These opportunities are extended to central London depot sites, where the trains used during the peak periods are stored during the rest of the day. If the peak periods are lower in demand overall, for example, capacity at these depots may be freed up to offload light freight goods at the depot sites as opposed to at the terminus station itself.

The freight operator noted that the use of single carriages within a passenger train may be operationally workable, as it could deliver a volume of goods to central London termini that would be operationally workable – there was a concern noted that the use of complete trains, whether they are converted passenger trains or dedicated freight trains, would create a significant oversupply into central London last mile operations.

The use of a converted carriage within a passenger train would require permissions from the TOC and Network Rail and may increase the level of delay, risk and complexity which the freight operator noted as being a significant factor in considering increasing their rail freight operation.

Cost - Short-term barrier, longer-term push factor

A number of interviews (especially TfL and the freight operator) stressed the significance of low operating margins within the freight sector, with operators currently understood to be working to a 1-3% profit margin.

To this end, operators are highly cost sensitive in planning and designing their supply chains and operations, and emphasised that a very small increase in the unit cost – the cost of delivering a package – can have a very significant impact on profitability when scaled to the large volumes of goods handled daily; 'the volumes are so big that a tiny change can impact the commercial model'.

This cost sensitivity creates nervousness for operators in terms of taking on a new supply chain and changing their operation significantly. To this end, the retention of a long-standing road-based supply chain is the safer option in the short term.

However, as was raised by both TfL and the freight operator, charges to drive vehicles within London, especially central London, increase the cost of a road-based freight operation significantly. Road user charging in the future in London would add considerable cost to the existing operation of freight companies, and would act as a significant incentive to non-road means of bringing freight into London.

The London Mayor is currently consulting on an extension to the Ultra Low Emission Zone, which was last extended in October 2021, as well as longer-term Road User Charging mechanisms, having publicly stated that additional Road User Charging is on the policy agenda to tackle air quality and climate change.

Rail freight may also introduce some cost savings for freight operators by way of central London real estate requirements; operators are now using central London real estate for last mile logistics centres; rail freight may not totally eliminate this requirement, but it would certainly be reduced significantly, with an associated cost saving as compared with road-based freight. 'You still need somewhere to store the bikes in central London so you don't fully eradicate the real estate requirement' (freight operator).

This would be balanced against additional resource cost associated with loading and unloading cages into carriages, requiring short bursts of intense resourcing at different locations. Furthermore, in recent months there has been significant public awareness around the availability of trained HGV drivers, which has led to short-term issues in the supply of consumer goods in the UK. More recently, the price of fuel has surged, leading to significant increases to the cost of delivering goods – this has been impactful to the freight industry.

This price volatility may be seen in isolated cases as short-term but is endemic to key components of existing road-based supply chains and creates price volatility and risk for both operators and consumers. Whilst increasing the amount of freight delivered by rail would address these issues positively, it would introduce alternative vulnerabilities, especially regarding the resilience of delivering goods in short timeframes. Whilst road-based freight can operate at the mercy of changeable congestion, it was stressed by the freight operator that the ability to re-route to get to a destination is hugely important, and that having goods stranded on trains in the event of an issue elsewhere (e.g. on the tracks) has 'enormous consequences. You cannot match the flexibility of the street'.



Station masterplan opportunities and public realm

Network Rail, much like TfL with its portfolio of property, is becoming increasingly aware of the need to design for agility in its portfolio. This agility is key to the way that the property team within Network Rail work, considering the design of stations as filling a role for the coming decades, rather than as final pieces of design not to be changed again.

There are a number of large station masterplans at various stages of design or completion within central London, some of which are private sector led, others public sector led. In each case, they present an opportunity to rethink ways of designing for a range of uses and, in much the same way that developers, local authorities and Network Rail (amongst others) are looking more seriously into the co-location of industrial land and residential uses, so too is consideration building for the integration of light freight and passenger movement.

This must be balanced with a prioritisation of passenger and pedestrian safety. It was stressed by Network Rail that 'safety is the top priority' within stations, and the mixing of freight operations involving roll cages and last mile cargo bikes etc could cause potential safety issues that would need careful management.

Likewise, in the Victoria BID interview, a main focus of the discussion was to do with the impact on public realm around stations with the introduction of rail freight operations to central London stations. Victoria BID has previously looked into river freightand one consideration that was not seen as having sufficient attention was the road-side transition and public realm impact – at some piers cargo bikes load from the river and cross over key pedestrian areas – 'if this is not looked at, there is potential for conflicts'.

In conversations with the BID interviewees, local congestion and air and noise pollution were both raised as key potential benefits for the wider uptake of rail freight. Camden Town Unlimited raised that the concentration of construction vehicles around very large sites, such as HS2 at Euston, can create significant noise and air pollution issues, whilst Victoria BID noted that interventions which result in the overall reduction of vehicles on roads should be progressed, adding that simply electrifying a vehicle fleet does not reduce the road safety and severance issues of vehicles.

Local congestion – rail freight helps to reduce traffic congestion, and reduce air and noise pollution. As much as alternative fuels for vehicles is to be applauded, it is not the end goal - the goal is '*not just changing fuels but reducing the number of vehicles in the first place*'. Even with electric vehicles, there remains public realm and road safety impact.

Governance

A number of interviewees acknowledged the institutional differences between the freight and rail industries.

TfL's role is limited in supporting rail freight, given it does not operate the Train Operating Companies, doesn't own the tracks or track permissions, and is not a freight operator itself.

It can and does, though, create a policy environment that creates the conditions that support rail freight. This is primarily through the Mayor's London Plan, which TfL support in preparation, but also through the Mayor's Transport Strategy and Freight Action Plan, all highly important policy documents in London which are relevant to forthcoming developments as well as local authorities. TfL can also support on coordination and education, especially for local authorities who have decision-making powers over planning and noise, where it was expressed that further education over the noise and pollution benefits of rail freight could be very relevant.

Complexity – it can be very onerous to operate on the railway network, with complex ownership structures, permissions, and legal agreements which add complexity and cost to rail freight.





Infrastructure

TfL emphasised that rail has traditionally carried freight, and central London rail stations are designed to accommodate rail freight, albeit with road-side adjustments, stating *"All of the London termini can take freight because they were designed for it"*.

Meanwhile, the freight operator noted that they are very interested in alternative delivery methods. This operator considers in their operation that they have a 'first', 'middle' and last 'mile', and whilst they see more traditional high-capacity rail freight as being potentially supporting for the first and middle 'mile', the opportunity for rail freight to support the last 'mile' has been less explored but is considered exciting.

It was noted that some roll cages can be too high to fit within train carriages, and they can also be heavy when fully loaded, which may prove challenging when considering health and safety requirements when transferring cages into and out of trains, via ramps, from platforms.



Figure 7: Stakeholders mapping





04.

Findings





04. Findings

This section considers the key themes of both the case studies and interviews, bringing them together into three broad categories:

- Drivers of Change the macro trends that, either directly or indirectly, are creating change relevant to the uptake of rail freight in London
- Opportunities short-term, more direct changes in the relevant . industries which create a positive outlook for rail freight in Londor
- Constraints technical, political, economic, barriers to a wider uptake of rail freight in London

Drivers of Change

The following items were identified during interviews as being drivers of change in favour of rail freight. They each exert influence on part of the supply chain affecting the resource, profitability and long-term sustainability of the road freight model, highlighting the advantages of rail freight and contributing to a more favourable context for its expansion.

Road user charging

Road user charging, also called congestion charging or road pricing, involves charging drivers for the use of the roads they drive on. This commonly applied within urban areas to decrease congestion and associated air pollution. The increase in road user charging policies means that additional costs are put on delivery vehicles driving through cities, which increases the overall cost of road freight. This is perceived as a key threat to road freight models by logistic operators.

To drive in London, depending on where within the capital, drivers are HGV driver availability

currently subject to both the Congestion Charge and the Ultra Low Emission Zone (ULEZ), the latter of which was expanded in October 2021 to cover the North and South Circular roads.

Sadig Khan has repeatedly made clear his intention of continuing to press ahead with some form of road user charging to radically address the 'triple challenge' of the climate emergency, air pollution and traffic congestion. In May 2022, TfL launched a consultation into a further expansion of thew ULEZ to the M25 boundary by August 2023. Delivery vehicles are not amongst the exemptions listed by TfL, though like other vehicles if they confirm to relevant air quality standards then they will be exempted in any case from the daily charge.

This consultation includes an opportunity to comment on longer-looking road user charging proposals under the heading 'shaping the future of road user charging'; this clearly sets the direction of travel for London's leadership, with road user charging debate ongoing within London and elsewhere, focussing on the potential to introduce technology that can charge vehicles on a per mile basis, rather than on a boundary basis as the ULEZ and Congestion Charge operate. A per mile charging basis could create significant additional cost for road-based freight operators in London.

As it becomes increasingly apparent that the direction of travel in London is for more stringent and technologically advanced road user charging, freight operators are looking for alternatives to traditional road-based freight operation, especially within London.

HGVs drivers are a key resource for road freight, playing a significant part in the supply chain. Their availability and cost is key in the functioning of road freight.

In Winter 2021, a shortage of HGV drivers led to supply chain issues for food, goods and fuel in the run-up to the Christmas peak.

For operators, this led to significant cost increases and inability to deliver some items on time. This was credited in one interview as precipitating a major supermarket to buy up additional freight train capacity.

The shortage of HGV drivers was seen as being caused by a combination of Brexit. Covid. and other factors such as tax conditions around IR35.

This shortage of drivers hit an acute moment in Winter 2021, and whilst it may not be the final time that this shortage occurs, this driver of change is not seen through the same lens as road user charging which is a longer-term trend towards a likely future.



04. Findings

Sustainability

As freight expand through an increase in home deliveries, building a sustainable freight model becomes essential.

Occupiers, building owners, and individual suppliers increasingly have sustainability as a driving force in their ESG policies or values. Within this, establishing sustainable supply chains is an area of focus for businesses.

Whilst this may be more established for major product importers, this trend is spreading to other businesses and building occupiers, including those buildings with shared building managers or facilities team.

Alongside this, local authorities in London are seeking increasingly stringent and progressive commitments to be made by developers at the planning stage for major new developments; in this context, requiring overnight deliveries is commonplace in the City of London, as is requiring the use of consolidation centres to reduce vehicle numbers through London.

Opportunities

There is a buoyant context for rail freight, with interviewees highlighting key opportunities to effectively support a transfer of freight to the rail. These should be seen as different pieces to bring together in order to strengthen rail freight.

Light Freight on passenger trains

Both the case studies and interviews demonstrated an eagerness to integrate light freight operations with passenger trains. This was seen by a number of interviewees as the exciting opportunity for freight in London.

A number of interviewees referenced the reduction in passenger numbers, especially commuters, as a result of the pandemic and the freeing up of capacity on these passenger trains.

Alongside this, light freight using a dedicated carriage of a passenger train can offer a volume of goods more commensurate with a last mile urban logistics operation than a full freight train, which risks oversupplying a station with goods.

Stations masterplans

A number of major central London stations – Liverpool Street, Euston for HS2, Waterloo Station, Victoria Station – are subject to future designs for improvements in some capacity.

This investment, alongside Network Rail's more flexible approach to their property assets, opens the opportunity for the incorporation of facilitating infrastructure – storage space, charging points – into forthcoming station masterplans.

Great British Railways

Great British Railways' creation in 2023 will offer an opportunity for a more collaborative way of working between freight operators and the rail industry.

It was established in a number of interviews that the pace of change amongst the freight and rail bodies can be quite different, and that there is significant legal and planning complexity to the establishment of a light freight operation.

Enabling a more collaborative and open forum between rail operators, policymakers, and freight operators is a major opportunity as a result of the creation of Great British Railways.

Infrastructure

Most central terminus stations have reasonable carriageway access from at least some platforms, enabling potentially efficient operations from a terminus station to final destinations.



04. Findings

Challenges

As shown in some of the failed trials, there are barriers to the development of rail freight which explain why supply chain organically developed towards road freight. Both infrastructural and operational barriers can limit the potential of rail freight.

Cost

It is established that the profit margins are lean for freight operators, and they can therefore be cautious when it comes to establishing new practices.

Whilst there would be savings in the cost of urban land needed for road-based last mile logistics centres, there would also be significant upstream costs for freight providers, whose operations and distribution centres are currently located around the UK's Motorway network.

Additional resourcing costs would also apply to the loading and unloading of goods at stations for a light freight operation by rail.

Infrastructure

A number of infrastructural issues were raised, including that the presence of seats on the carriages limits their capacity for carrying goods.

Place goods on seats in bags could be labour intensive and time consuming, and may risk delicate goods in general sacks that could fall off seats.

Likewise, some roll cages can be too heavy for only manual transfer, and also too high for use in train carriages.

Identified key macro trends are creating an environment which aligns

all major stakeholders towards rail freight from a consumer, policy, and cost perspective.

Key opportunities are around a trend towards growing collaboration, through the likes of forward thinking and agile station masterplanning and the establishment of Great British Railways.

Likewise, case studies and interviews have shown that light freight could be introduced on passenger trains, whose patronage is in the greatest period of long-term uncertainty in decades, which may open further opportunities to share passenger train services with light freight.

There are a number of significant barriers, though. The primary barrier is low profit margins in the freight sector causing a nervousness amongst operators to fundamental changes to the supply chain.





Goods Typology



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05. Goods Typology Assessment

Infrastructural opportunities and barriers will vary and lessen depending on the type of goods carried. A large variety of goods are currently moved on roads with different storage and delivery requirements, which will affect their compatibility with the specific infrastructural and operational characteristics of rail freight.

The following section assesses the compatibility of different types of good with a potential rail freight supply chain, to identify goods with the highest potential and focus initial efforts on transferring these to rail.

Based on the rail freight infrastructure presented in the next chapter regarding a rail freight supply chain, the following risks/characteristics have been identified to determine the type of goods most suitable for transport via rail freight:

- Lack of flexibility of rails: Trains can be blocked on tracks with no alternative routing, unlike diversionary routes on the road network, that are relatively easy and simple to implement. There is a risk of parcels being held in the same location for a long time with rail freight. **Time and business sensitive parcels should be excluded.**
- Volume: Due to a risk of over-supply and/or lack of capacity for full freight trains on the rail network, freight should only take place in one carriage of passenger train during initial stages. This means that the volume that can be carried is reduced. **Rail freight should focus on smaller volumes of freight.**
- Platform: As loading and unloading will prove challenging due to time restrictions (designed to prevent conflicts with passenger services), **light logistics that can be easily loaded, unloaded and moved should be preferred.**
- Storage requirements: Light and flexible container adaptation are preferred during early stages. Carriages fitted for certain temperature controls will not be used by passengers and will constitute permanent changes to the rolling stock, which might be more challenging to implement. This means that temperature sensitive goods might not be carried. **Goods that are non-perishable should be preferred.**
- Suppliers: there are challenges around small suppliers' consolidation within the same train. Trials should initially focus on one supplier / suppliers in close proximity with interest in common.

Four main categories of goods where therefore assessed based on these criteria:

- Perishable food
- Non-perishable food
- High value goods
- Bulk items

The key land uses associated with these goods' deliveries have also been identified.

The assessment is provided in Table 1. It concludes that goods that are easier to consolidate and lend themselves to bulk packaging will be best for freight by rail. This includes high value goods, bulk items and non-perishable goods.



05. Goods Typology Assessment

Types of goods	Example	Sensitivities / opportunities	Volume	Appropriate for rail freight	Main land use delivery
Perishable goods	Fresh food	Temperature requirements Required speed of deliveries	Large / medium / small depending on the supplier	No (other than for niche products)	Food retail
Non-perishable goods*	Canned food, dry food, furniture, fashion, objects	No temperature / strict storage requirements	Large / medium / small depending on the supplier	Yes	Food retail, Non-food retail
High value goods*	Luxury goods, watches, rare items	Protection of the goods Extra client service Less time constraints	Small	Yes	Residential
Bulk items*	Office supplies/ cleaning supplies	No temperature / strict storage requirements	Large	Yes	Office

Table 1: Type of goods assessment - Suitability for rail freight



IP THE AND AND



Station Suitability

XXXXX

Welcome to Liverpool Street Station



Based on this type of goods, stations have been assessed to evaluate which would be more suitable to rail freight trials. In this case, which stations would be located closer to where most of the goods suited for rail freight (Section 5) are likely to be delivered. As shown in Table 1, these goods are more likely to be delivered to certain land uses.

By association, the following land used have therefore been ranked by 'potential for rail freight'. A land use with a high potential for rail freight is a land use where appropriate goods are more likely to be delivered:

- 1. Residential: High potential for rail freight (destination for high value goods)
- 2. Non-food retail: Medium to high potential for rail freight (destination for non-perishable goods)
- 3. Offices: Medium potential for rail freight (destination for bulk items)
- 4. Food retail: Low potential for rail freight (destination for perishable and non-perishable goods).

The density of these land uses was assessed in the surroundings of five key terminus stations in London to assess their suitability:

- Liverpool Street Station
- London Euston Station
- Old Oak Common Station
- London Victoria Station
- London Waterloo Station

From these stations, catchment areas were developed for e-bike (assumed to be similar to cargo bikes) and pedestrian couriers. These show how long it would take for deliveries to be brought to locations from the stations to the land use highlighted. Based on this, each station was then allocated a 'level of potential scores'.

The score is shown on a scale of 100, 100 being the highest potential and 0 the lowest one. This means for instance that stations scoring close to 100 are likely to have a higher density of residential and non-food retail land uses accessible by e-bike or foot.









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Spatial Opportunity

Based on their average total score for both walking and electric cargo bike catchments, the stations are ranked as follows:

- 1. London Euston
- 2. Liverpool Street Station
- 3. Victoria Station
- 4. Waterloo Station
- 5. Old Oak Common Station

London Euston, Liverpool Street and Victoria Station scored based, due to their higher proximity to the residential and non-food retail land uses.

London Euston

The station to obtain the overall highest score of suitability is London Euston, which also has the best electric cargo bike catchment score.

The walking catchment map shows that London Euston provides good access to residential and non-food retail land uses within a 15mn catchment. The C3 Residential use is the highest use within a 10 to 15 minute walking catchment with a score of 73. Residential uses are mainly densely located around Mornington Crescent just north of London Euston Station, and east, near Regent's Park.

However, there is a low level of access to the residential land use within shorter walking distances (below 10 minutes). The most accessible land uses within a five-minute walk is food retail, which has a low level of potential.

This shows that pedestrian couriers would probably have to walk above 15 minutes for deliveries, the highest acceptable walking time, which might not be sustainable especially with several delivery points. Walking courier itineraries would need to be carefully designed and deliveries grouped by locations to avoid long walking times with a heavy load of delivery.

On the other hand, the electric cargo bike catchment map shows that from London Euston, e-cargo bike drivers would have a good access to the dense residential land uses located in northern London. Similarly to the walking catchment, these land uses are most densely located in the highest walking catchment distance (within 30 minutes). However, a reasonable density of residential land use is provided within 10- and 20-minute catchment.

London Euston is therefore strategically located for both e-cargo bike and pedestrian deliveries if careful management of pedestrian deliveries is put in place. Deliveries should be consolidated and timed in the day by specific destinations to ensure that courier do not have to cross the whole catchment area several times.

It is noted that HS2 work is taking place at the moment, which might disrupt rail freight trials. London Liverpool St and Victoria Station are however both strong alternatives for trials.





Liverpool Street

Liverpool Street has the second-best overall score and best walking catchment overall score, with a high potential for deliveries made by foot. Residential uses are located closer than for London Euston, in Hackney and Tower Hamlet. These are mostly accessible just above a five-minute catchment. Non-food retail is also available across all catchment areas.

The e-cargo bike catchment map also shows that high level of residential uses are accessible within 20 minute and 30 minute catchments, with a very high score of catchment within 30 minutes.

Trials from Liverpool Street, for both walking and e-cargo bike couriers, could be strategically focused on neighbourhoods' northeast of the station, where most of the residential land use is located.

Victoria Station

The walking catchment map shows that there is a high potential for deliveries to be made to the south and east of London Victoria Station, where high level of residential uses are located. Deliveries could be focused on these areas for pedestrian couriers.

The e-cargo bike catchment from Victoria also shows a high potential within a 10 minute catchment area, mainly concentrated south and west of the station. High levels of residential and non-food retail land uses are provided within this catchment. Focusing e-cargo bike deliveries on these area for a trial would be very promising, as deliveries could be made within a small catchment area.

Old Oak Common

The walking catchment map from Old Oak Common shows a very low level of potential for delivery made by foot. The residential land use is mainly located south, within a 30 minute walking catchment and at a low density. The pedestrian permeability from the station is low, therefore not providing a direct access to all land uses around the station.

The e-cargo bike catchment map from Old Oak Common Station also shows that within 20 minute catchment, there is not a high potential for deliveries to be made. There is a higher potential within 30 minute, with residential areas located south and north of the station.

If trials are developed at Old Oak Common, these should be focused on e-cargo bikes and on south and north areas.

Waterloo Station

Waterloo Station obtains the lowest overall score. The walking catchment map from the Station shows low potential for pedestrian couriers within a 15 minute walk and higher levels of potential beyond the 15 minute catchment. Residential uses are mainly located southeast of the station.

There is a high level of potential for e-cargo bike deliveries from Waterloo Station, with access to residential land uses south and nonfood retail just north of the station. All catchments provide a high level of potential, therefore making deliveries possible from the station.





Infrastructural Opportunity

Liverpool Street Station

Liverpool stations comprises 17 electrified platform faces and a central platform-level goods vehicle access road between platform 10 and 11. There is an opportunity for vehicle to access and exit the platforms through this access road. Platforms 10 and 11 would be best suited to trainload operations based on their length and proximity to the central road access. They can both accommodate 12-coach formations.

London Euston

London Euston comprises 16 electrified platform faces, purpose-built Parcel Deck and onward access to Central London via the Euston Road.

The station previously accommodated Royal Mail services through to 2004, and road vehicles were travelling onto the platforms via entry points at the southern end of the station from Melton Street and the A4200 Eversholt Street, departing via Cardington Street/A400 Hampstead Road or Eversholt Street at the northern end of the station.

The Colas Rail trials used the same access point. There is a potential to use this access for deliveries from the station.

Victoria Station

Victoria comprises 19 electrified platform faces and goods vehicle access at concourse level to the front, eastern and western side of the station.

Delivery and servicing activity by road for on-station retail tenants takes place via a loading bay accessed from Buckingham Palace Road. The loading bay operates as a virtual "air lock" with doors at either end facing the highway and (protected by a movable barrier) platform 13-19 concourse area respectively.

There is also a holding station located near Victoria Station which could be used for rail freight trains.

Summary

Amongst the three best scoring stations, the infrastructure is also available for safe and efficient trials to take place. These could make use of the existing vehicle delivery and servicing infrastructure for the stations' retail, and be well accommodated without negatively impacting the pedestrian environment.







On the basis of the differing challenges and opportunities when comparing freight transportation by rail with road, we have identified what a day in the life of a parcel would look like in a viable and sustainable rail freight model. For each of the step, we have highlighted opportunities and solutions to tackle the challenge.

The day in the life of a parcel allows a focus on each key link of the supply chain and how these could support rail freight. For each link, key opportunities and challenges have been highlighted which should be taken into consideration in rail freight trials.

While both supply chains start from the transfer of goods from commercial ports via roads to warehouses / sort centres, they then divert. Road freight can be directly delivered to the city following management in the warehouse for smaller suppliers, or will go through the additional step of a delivery station in a city suburb before the final dispatch.

Rail freight will require some additional steps as goods are loaded into trains and dispatched to train stations in city centres. A final sorting then happens for the last mile delivery, where goods are distributed in cargo bikes.

The following graphic shows the two different supply chains for both rail and road freight.











Transfer from commercial ports to roads

Challenge: HGVs driver shortage, rising and uncertain fuel costs, and environmental impact.

Opportunity: Through encouraging rail freight, HGVs drivers' capacity will be freed for nonreplaceable trips from commercial ports.

Commercial ports



Challenge: Consolidation of small retailers

Recommendation: Focus on single and/or large suppliers. Focus on retailers already consolidated / with similar interests (example – Camden Market). Focus on light logistics.



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Transfer from Warehouse to trains

Challenge:

Transfer to rail station. Additional break in the supply chain. Reduces the commercial viability of the model.

Recommendation: Locate warehouses close to rail stations.

Create warehouses fitted with tracks and linked with the railway network.



Transfer from Warehouse to trains

Transfer from platform to train



Challenge:

Restricted capacity on the rail network. Space for freight trains is already used. Some cages are too high (2m) to fit into the train Lack of flexibility of the rail network: Greater risk of delay if a train is blocked on the

track.

Opportunity:

Use a carriage of passenger trains instead of full freight trains to avoid capacity issues. Passenger train – no container adaptation: use adapted cages rolled between the seats / adapted bags strapped to the seats.

Passenger train - container adaptation: Passenger seats can be fitted with tracks. They can be pushed to one side of the carriage when freight is loaded.

Focus on parcels that are not time / business sensitive

Use of dedicated carriages for light freight i.e. no sharing of passengers and freight within same carriage













4 Transfer from train to cargo bike

Challenge:

Requirement for step-free access to stations Restricted timing to unload large volumes of freight without disrupting passenger services 'Dead' time for workers at stations

Opportunity:

Train holding stations: Use the existing infrastructure of holding stations to unload goods separately from passengers and peak hour flows Storage on the platforms: Cages are rolled out when passengers depart the trains and held into storage spaces until the platform is clear of passengers. Goods are then loaded into cargo bikes and dispatched





Challenge:

Sustainably moving large volumes of deliveries to their final destination. Cycle infrastructure to manage the interface between the station and the road. Bringing deliveries to the street without creating congestion / negative impacts around trains stations.

Opportunity:

Use cargo bikes for last mile deliveries. Focus on goods that can fit within a cargo bike Use existing infrastructure within stations for delivery and servicing to local retailers: access roads for vehicles, loading bays, etc.





Conclusions

08.



Based on the findings of this report and required supply chain identified, some key recommendations have been established, aimed at potential rail freight stakeholders. While challenges remain for the mainstream adoption of rail freight, there is potential to expand and test the model furthermore, exploiting current opportunities and anticipating challenges.

These recommendations should be read as key steps to follow when putting in place a rail freight trial.

Findings

The diversity of challenges slowing the development of rail freight reflect the plurality of stakeholders and their competing interests and requirements. Road freight is so strongly embedded in supply chains that the infrastructure, organisation and economic models of freight has been developed around it – it is the way that supply chains have evolve organically; it is therefore challenging in the extreme to reverse all of that organic evolution. This means that switching to rail freight requires significant effort and investment from all stakeholders involved, which makes it less attractive and slows its adoption.

While large scale rail freight would provide more benefits, it is this scale that brings the more significant challenges in terms of reversing out the organic evolution of supply chains. However, smaller scales measures and adaptations can slowly embed rail freight in practices before a larger infrastructural alignment take place. In this report, we have shown that small scale actions are possible through the use of adapted passenger trains and a focus on the most suitable products.

There is an exciting opportunity to make use of existing rail services with excess capacity, around which supply chains can be altered to align with. Trials based on these principles have the potential to embed rail freight more strongly into the supply chain.

A successful development of rail freight will hinge on both incentives and obligations, aiming to make it an attractive and economically viable option. These can tilt the balance in favour of rail freight and facilitate its uptake, as detailed below.

Recommendations

The following recommendations are intended to guide both the short and long-term development of rail freight. The stakeholder targeted for each intervention has been specified.

Policy makers

Road User Charging. Whilst the motivations for Road User Charging are rooted in air quality improvements, addressing the climate challenge through modal shift, and reducing congestion, an indirect consequence of certain types of road user charging would be to make alternative forms of freight significantly more attractive as compared with road-based freight in central London.

Within this, a road user charging system that does not provide exemptions to freight vehicles would be the most effective 'stick' measure for freight operators, as would a pay per mile style of road user charging which would penalise drivers for driving larger distances within London, unlike the current boundary-based charging systems.





All stakeholders

Collaborative trial commencement. While some changes will only be implemented in the long term, it is crucial to test and experiment with rail freight operations. It is proposed that Network Rail coordinate a trial for light freight, operating from London Liverpool Street station. This trial would need to last for a sufficient time for lessons to be learnt and responded to, and for occupiers and consumers to settle into a new supply chain operation. It would focus on products that suit the high density of commercial uses, focussing on office supplies, with upstream integration with East London's large distribution centres at and near to Barking. Carriages from passengertrain services would be used, using small roll cages and ideally adapted seat bags, too.

The key stakeholders in this trial would have roles as below:

- Network Rail owners and coordinators of the trial operation's rail and station-side activities, and leading on the coordination with other stakeholders, including via a forum which would report before, during and after the trial operation.
- Train Operating Company support with timetabling and identification of appropriate train services for the addition or repurposing of carriage for light rail freight.
- Freight operators preferably operating in a collective way, running the road-side operation. Freight operators should look to work as collaboratively and openly as possible, notwithstanding commercial sensitivity.
- BIDs advertise amongst member groups and provide a collective voice for end users of freight trials. Consider benefits and impacts holistically across the highway network and for customers (large commercial occupiers).
- Department for Transport funding support for trial.
- Transport for London and local highway authority potential funding support as well as support with coordination of roadside operations to ensure public realm and highway impact is managed appropriately.

Establish a rail freight forum. This forum would provide an opportunity for stakeholders to share their areas of concern and opportunities with each other and discuss ways of troubleshooting or resolving issues. It could include considerations for means of addressing station design requirements, improve understanding of requirements and operations to create a friendlier design and policy environment and encourage partnership. We consider that the forum should include core stakeholders of Network Rail; a range of freight operators including the large established scale operators as well as more specialist distribution operators; Transport for London; as well as additional stakeholders of local authorities; Department for Transport; Train Operating Companies; planning and highway authorities; Business Improvement Districts and other business groups.



Businesses and Business Improvement Districts (BID)

Small scale trials: While this is put in place, small scale trials can be implemented. These can follow the below steps:

- Survey of local businesses (within walking or e-cargo bike catchment of a station) to assess interest for rail freight and potential participants
- 2. Creation of a small rail freight group to organise the trial and maintain engagement
- Discussions with station managers of key terminus points to establish the feasibility of station-side operations and public realm impact considerations
- 4. Identification of suppliers near a station connected to the final destination
- Coordination of a single cargo bike or delivery company from warehouse to train and train to final destination. Train operators and station managers

Design requirements standardisation. Establish a framework for operations to support a more standardised approach to core elements of forthcoming trials and partnerships. This would include key areas of concern, such as ramping from platform to carriageway, the type and sizing of roll cages, carriageway access requirements, and storage and charging requirements at a station. The guidance should have flexibility to allow for different trials with different operations, but support cross-industry information sharing.

Container adaptation. Both the containers in which light freight is transferred and passenger train carriages can be subject to design improvements that may support more efficient light rail freight operations in the future.

Manage station / road interface space. Prioritise pedestrians around stations whilst designing means of access for cargo bikes as close to platform areas as possible. Consideration is needed for rail freight trials and operations of the impact on the local highway network, both improvements through a reduction of vehicle trips, and any impacts that may arise through the concentration of light freight operations into a busy area. Trials should also consider at the planning stage the timings of peak pedestrian periods and aim to design light freight operations away from those times.

Network Rail

Real-estate management. Network Rail should look to safeguard spaces at key stations for operational uses such as storage or electric charging points to support a light freight operation. This opportunity is especially relevant as Network Rail looks to adopt a more agile approach to its property assets, considering flexible uses and longterm changes rather than 'final product' stations. With development close to some key stations, alongside forthcoming masterplans for others, there are opportunities to design in key operational elements to stations.

Alongside this, Network Rail should explore alternative assets, especially depots in central areas which have road access, which could integrate a rail freight trial and operation. These areas hold excellent potential as they may retain the high-quality access to central London for light freight by rail with fewer, or less acute, interface challenges with pedestrian movement.



Report Summary

Freight is the backbone of cities, providing critical supplies to all land uses throughout cities, ensuring that urban centres can sustain themselves. As cities, freight operators, policymakers and consumers come to terms with addressing the climate challenge, alongside improving air and noise quality, sharing very limited highway and kerb space amongst many users, and improving the public realm, the standard operating model of freight by van is increasingly in question. Alternative freight models are therefore coming to the fore in central London, where congestion and air quality issues can be more acute.

Transitioning away from a highly established road-based freight model is not easy, and requires shifts to encourage change. Alongside the cross-stakeholder move towards establishing more sustainable supply chains, the introduction of congestion and emissions charging has made road-based freight increasingly expensive. Further road and kerbside charges in London, such as Road User Charging which is clearly high on the mayoral policy agenda, continue to add pressure to freight operators to find alternatives to petrol and diesel-based vehicular trips in central London.

Amongst these alternative supply chain models is rail freight. There is a long-established rail freight industry for heavy goods travelling relatively long distances. Much of this is not transferable to central London, with different goods being in higher demand in central London as well as the ability to process larger scales of supply being hampered in the congested urban centre. Light freight by rail has been trialled with varying degrees of success. The change to commuter and leisure passenger demand on trains precipitated by the global pandemic has further opened the opportunity to use carriages, either as they are or repurposed, from passenger trains to carry light freight.

With existing platform to road connections and the ability to unload trains, terminus stations in central London are seen to have the higher potential for light freight by passenger train models. Stations have varying degrees of potential based on the surrounding land uses and the nature of demand for goods from these uses.

Cost and cooperation barriers exist for the extension of rail freight to light goods. Operating on the railways can be complex and legal and other agreements onerous. Cooperation between competing freight operators would significantly benefit the overall rail freight opportunity, and a rail freight forum is a key recommendation for this study. The establishment of Great British Railways in 2023 can help in this regard, with one of its core tenets being to bring 'simplification'⁵ to the rail network.

This report has identified key opportunities and challenges for an uptake in rail freight, which has the potential to improve the sustainability of the freight supply chains. It should be read as an informative piece for stakeholders looking to undertake trials, redevelop their infrastructure or influence the policy environment in favour of rail freight.





Endnotes

1 Understanding the UK Freight Transport System, Future of Mobility: Evidence Review, Government Office for Science,

February 2019

- 2 The London Rail Freight Strategy, Options for the future, Network Rail, 2021
- 3 Sustainable urban freight, (2015) Eltis, Urban Mobility Observatory
- 4 ORR 'Passenger Rail Usage: January to March 2022', 16th June 2022 '
- 5 Great British Railways: The Williams-Shapps Plan for Rail' May 2021

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