



# Waterloo Freight Hub Impact Study

## Summary Report

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Cross River Partnership (CRP) is a partnership delivering environmental, economic and community focused projects.

CRP supports public, private and voluntary organisations to address creatively challenges around Air Quality, Transport, Placemaking and Wellbeing.

CRP has commissioned a series of independent studies, to identify opportunities for improving the quality, efficiency and sustainability of deliveries across London.

CRP commissioned this study to better understand the outcomes of creating a hub for freight and logistics, using under-utilised space beneath Waterloo Station.

In particular, CRP wishes to consider the social and economic impact and contribution these logistics hubs can make to local areas and London, and how local economies and people can benefit from these being in place.

The study has carried out the following tasks:

- Reviewing trends in retail and logistics activity, identifying key drivers of urban deliveries and associated impacts from global to neighbourhood level;
- Reviewing case studies of new urban logistics models using alternative vehicles, power sources and depot locations;
- Site visits to Waterloo to assess access, space and supporting infrastructure and facilities;
- Engagement with a sample of logistics users and operators to determine interest in using / operating from a new freight and logistics hub at Waterloo;
- Assessment of a range of possible scenarios for the new hub, to determine the scale of potential outcomes.

This report summarises the main findings of the background technical report, and should be read alongside other reports produced for CRP by Steer, focussing on rail freight operations.

London is a vibrant city with a 24/7 economy. Those who live and work in London expect to be able to order goods and services at the touch of the button, with delivery now expected within hours.

Those charged with delivering these goods and services enable London's economy to function, but currently rely in most cases on unsustainable modes of road transport.

The growth of the internet-based economy has led to significant increases in goods vehicle activity in recent years, and without alternative options, the concern is that growth in goods vehicle traffic (and associated impacts) will increase further relative to other traffic, increasing congestion and reducing traffic flow.

Whilst goods vehicles represent a minority share of traffic in London compared to other vehicles, they account for a disproportionately higher share of accidents and emissions. Their greater physical dimensions (particularly articulated and larger rigid vehicles) also create greater visual impact in urban areas. This affects Londoners' quality of life, health, and the ability to reach net zero, as well as business efficiency.

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. We therefore need to shift to greener modes and make deliveries more efficient.

London used to make use of railways and the River Thames to deliver the goods. The post-war move to a road-based economy saw most of the rail and river services and depots disappear, seemingly forever. Similarly, land available for logistics and industry in London has shrunk by a quarter over the last 20 years.

However, buried beneath the bustling passenger concourse at Waterloo Station, at the heart of the city, remains a large vacant reminder of how goods used to be delivered to and from London.

Responding to the renewed interest in the use of trains, electric vehicles and cargobikes for movement of freight in urban areas, CRP considers that the space available below Waterloo Station could help foster more sustainable urban logistics.







Work undertaken to inform the local context has included:













- Reviews of published studies undertaken by public and private-sector stakeholders across a range of topic areas and perspectives, to identify challenges, opportunities and overall trends in activities related directly or indirectly to freight and logistics;
- Assessment of London- and Borough-wide statistics, to build up a profile of the local area in terms of demography, economics, transport, land use and environment, and create a set of baseline figures and variables on which to assess alternative scenarios (see later);
- Reviews of developments in urban logistics over the last 25 years, with a focus on commercially-sustainable means to improve the efficiency of the supply chain and, as a consequence, the sustainability and carbon footprint of the associated activities;
- Mapping of existing logistics companies in and around Lambeth, to determine clusters of activities and the nature of the floorspace and associated access arrangements, set within the wider regional and national mapping of the major retailer and carrier depot networks;
- Surveys of Waterloo Station at concourse and basement levels, to determine the extent and quality of vacant floorspace, along with access to road and rail networks, utility connections and other amenities;
- Engagement with a sample of operators and users of logistics facilities and services, to determine potential interest in using the space and facilities at Waterloo Station where this would complement or replace facilities elsewhere in London and the surrounding areas.

The research has produced a local framework of tools and techniques for improving logistics, set alongside a set of challenges and opportunities at the local level. Within this framework, a set of actions and outcomes has then been assessed through a series of scenarios, to help determine how best to address the challenges and unlock the opportunities, either directly or indirectly.

The research has identified a range of solutions implemented in recent years by users and operators of logistics services, to improve efficiency and sustainability overall or with a particular focus on “first mile” and “last mile” within urban areas. These include:

COMPANIES	BEFORE	ACTIONS	OUTCOMES
	1,200 parcels per day delivered in a fleet of 7 x 3.5t diesel vans into London from an outer-London depot 29km away in Enfield.	Deliveries consolidated into a single 18-tonne HGV feeding overnight into a small Central London depot, from where 9 electric cargobikes / vans delivered to local customers.	<ul style="list-style-type: none"> <li>• 14% reduction in the total distance travelled between the distribution centre and the customers;</li> <li>• 55% reduction in total CO2e emissions per parcel delivered.</li> </ul>
	6-7,000 parcels per day (Xmas peak at 17-18,000 per day) delivered in a fleet of 35-50 x diesel vans into London from an outer-London depot.	Deliveries consolidated into 8 x 7.5 tonne HGVs feeding a local depot in Central London, from where 35 electric vans delivered to local customers.	<ul style="list-style-type: none"> <li>• 81% reduction in vehicle mileage;</li> <li>• 88% reduction in fuel use;</li> <li>• 52% reduction in total distance travelled per parcel.</li> </ul>
	Customer deliveries previously made in petrol / diesel vehicles.	55 cargobikes operating from a Central London depot covering a 15km radius. Data on 1,000 deliveries over 100 days in 2020-2021 compared against an estimated use of diesel vans.	<ul style="list-style-type: none"> <li>• 65% reduction in total delivery time;</li> <li>• 5% reduction in total delivery miles;</li> <li>• 91% reduction in CO2 emissions;</li> <li>• 6% improvement in average speeds;</li> <li>• 75% improvement in number of delivery drops per hour.</li> </ul>
	Customer deliveries previously made in petrol / diesel vehicles.	Use of high-frequency, high-speed scheduled passenger train services to carry parcels, using stations to interchange with zero-/low-emission first/last mile couriers.	<ul style="list-style-type: none"> <li>• 110km/h average linehaul speed</li> <li>• &gt;97% linehaul on-time arrival</li> <li>• Zero-emissions using electric trains + electric vehicles and cargobikes.</li> </ul>

Waterloo Station is located in the northern part of the Borough of Lambeth, information provided by the Council giving an indication of the various opportunities and challenges for the local community, which a new freight and logistics hub might help address. These include:

 <p>Lambeth is an inner south London borough with around 322,000 residents.</p>	 <p>3% of jobs in Lambeth are in transportation and storage, lower than across London (5%) or England (5%).</p>	 <p>Carbon emissions in Lambeth are falling. Since 2005, Lambeth's borough-wide carbon emissions have fallen by a year-on-year average of 3.5%.</p>
 <p>The borough has the 2<sup>nd</sup> highest working age (16-64) population in London, with almost 75% of the population in this age group.</p>	 <p>A small number of transport and storage companies (10) operate in Lambeth, employing 4,480 people and accounting for £1.2m of turnover per annum.</p>	 <p>Continued at this rate, emissions would be approximately 60% below 2005 levels by 2030, and approximately 80% below 2005 levels by 2050.</p>
 <p>With a large working age population, Lambeth also has the second highest employment rate in London at 80.8%.</p>	 <p>Life expectancy in Lambeth is low compared to London at 78.6 years for males (2<sup>nd</sup> lowest in London) and 83.2 years for females (5<sup>th</sup> lowest in London).</p>	 <p>The North of the borough (including around Waterloo Station) is far more likely to have high levels of NOx in the air compared to the south of the borough.</p>
 <p>Proportionately, more people work in professional, technical, or senior roles in Lambeth than the working population of London or England, and the median income is higher.</p>	 <p>12.7% of the population indicate that their day-to-day activities are limited to some extent by health problems or a disability.</p>	 <p>Transport emissions are a smaller share of Lambeth's total (24%) than the UK-wide average (36%), the vast majority being from petrol and diesel vehicles.</p>



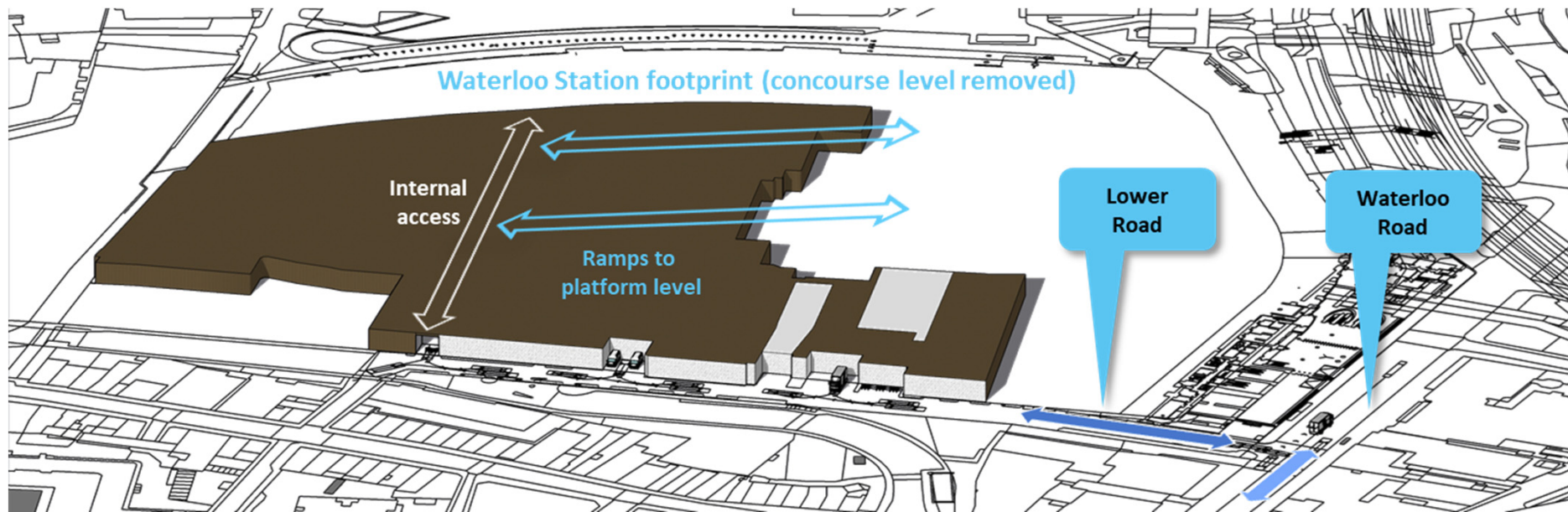
Waterloo Station represents an increasingly rare opportunity for the logistics sector, in terms of location, scale and accessibility:

- Located at the centre of the Capital, close to the City of London;
- 300,000 people live within 3km, well within the range of cargobikes and electric vehicles;
- Up to 200,000 square feet of unused space available beneath the passenger station concourse;
- A highly-secure facility, the legacy of its previous use handling Eurostar international passenger and cargo traffic;
- Dedicated, fully-enclosed highway access onto Waterloo Road;
- Access to 24 rail platforms and 800 trains each way per day;
- Onward access to the national rail network.

Suitably scaled and repurposed, Waterloo could be a new central London hub for freight and logistics, providing a consolidation point, a base for a fleet of cargobikes and electric vans, and an interchange for parcel-load and trainload rail traffic.





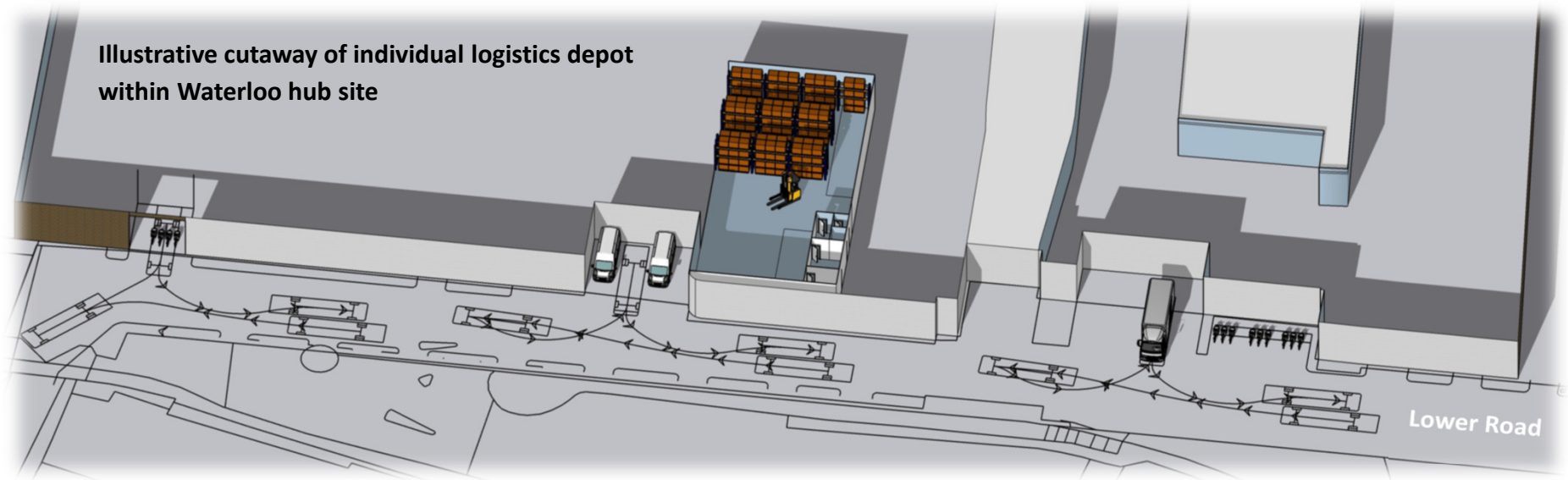


Beneath the bustling concourse of Waterloo Station exists a large undercroft of corridors and chambers, which used to handle goods traffic delivered to and from London by rail (plan of space above).

Lower Road provides access to and from Waterloo Road, providing sufficient headroom for goods vehicles (4.4m) into the undercroft area. Via a series of loading docks on Lower Road, access routes then extend across the undercroft, and to platform level via lifts and ramps used for passenger train and retail delivery and servicing.

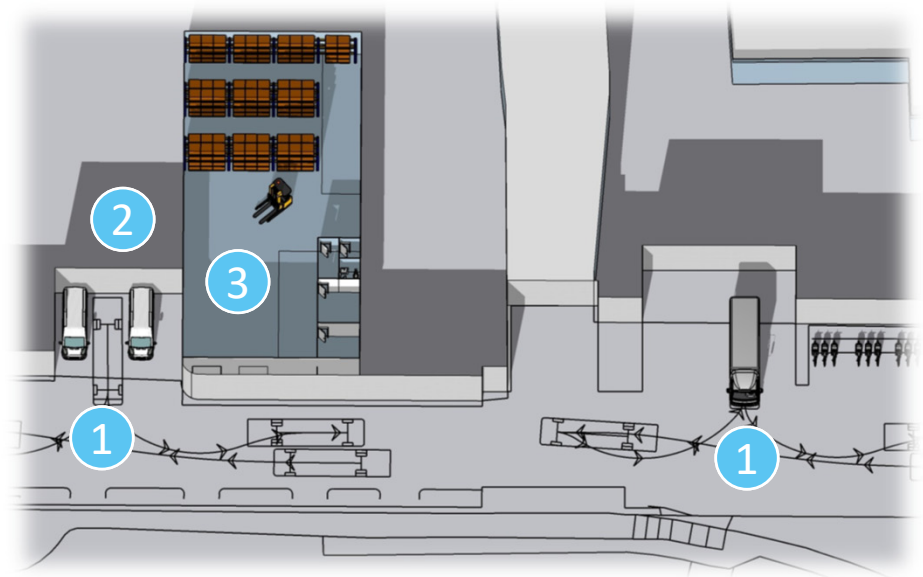
During the 1990's, considerable investment was made in new high-security delivery and servicing facilities, to support international passenger and parcel services which operated through to 2007.












By reconfiguring the existing space beneath the station, a new community of delivery companies could be created, sharing access to the road and rail networks. Typical facilities could include:

1. Parking for smaller goods vehicles, vans and cargobikes with electric charging points. The plans shown here indicate typical swept paths for rigid delivery vehicles up to 10-12m in length;
2. Open areas for unloading and reloading of vehicles;
3. Secure storage units for temporary holding of deliveries en route from origin to destination, together with office and amenities for depot staff and vehicle drivers.

















In order to test the potential range of outcomes which might be possible through Waterloo, a baseline data set has been produced from the preceding research, to determine the extent to which various types / level of actions might affect the level of outcomes achieved, including:

CHALLENGE	OPPORTUNITIES	ACTIONS	OUTCOMES
 <b>Business</b>	Unlock vacant space below Waterloo Station for freight and logistics use.	Attract tenants using and/or operating logistics services from site.	Improved availability of more sustainable last-mile delivery services.
 <b>Mode Shift</b>	Unlock capacity on the rail network for parcel-load and trainload freight use.	As above, plus engagement with passenger and freight train operators.	Greater freight traffic and revenue by rail, improved rail network utilisation.
 <b>Traffic</b>	Reduce the number of larger HGVs on roads in Central London.	As above, plus greater awareness-raising with residents and business.	Greater mode shift and consolidation of freight, reducing larger HGV trips.
 <b>Emissions</b>	Reduce Borough / neighbourhood emissions from local freight activities.	As above, plus providing sufficient charging infrastructure for vehicles.	More freight moved in smaller, quieter, low/zero-emission vehicles.
 <b>Economy</b>	Increase business activity and net contribution to the local economy.	As above, plus linking to stakeholders in business and local government.	Increased business turnover from site feeding into local economy and rates.
 <b>Jobs</b>	Improve employment prospects for the local community.	As above, plus linking to stakeholders in education, training & employment.	Greater number of jobs created locally across a wide, diverse range of skills.
 <b>Health</b>	Improve health prospects for the local community.	As above, plus linking to stakeholders in healthcare and wellbeing.	Improvements in air quality, reduced traffic, noise and congestion.

The table below shows the scenarios tested, driven by input assumptions on the level and nature of parcels delivered between the site and the rest of the country. This determines the level of activity on site and in the local area, from which other indicators are then quantified:

Scenario	1 Road-only	2 Road-only	3 Road-only	4 Road-only	5 Road + Rail	6 Road + Rail	7 Road + Rail	8 Road + Rail
<b>Summary</b>	Initial operation with small last-mile operator	Larger road-based operator	Increased scale of operations	As Scenario 3 but using cargobikes	Initial operation with small last-mile operator	Larger operator	Increased scale of operations	Maximum scale of operations
<b>Deliveries of parcels to/from rest of UK</b>	2 per day using electric vans	2 per day using diesel HGVs	4 per day using diesel HGVs	4 per day using diesel HGVs	4 per day using scheduled passenger trains	117 per day using scheduled passenger trains	1 trainload per day	7 trainloads per day
<b>Parcels handled per day</b>	350 into London + 25 out of London <b>375 total</b>	1,300 into London + 90 out of London <b>1,390 total</b>	2,600 into London + 180 out of London <b>2,780 total</b>	2,600 into London + 180 out of London <b>2,780 total</b>	160 into London + 10 out of London <b>170 total</b>	470 into London + 30 out of London <b>500 total</b>	20,000 into London + 1,400 out of London <b>21,400 total</b>	139,000 into London + 9,900 out of London <b>148,900 total</b>
<b>Deliveries of parcels to/from the locality</b>	10 per day using 3 cargobikes	6 per day using 3 diesel vans	15 per day using 7 electric vans	69 per day using 9 cargobikes	5 per day using 2 cargobikes	13 per day using 6 cargobikes	520 per day using 44 cargobikes	795 per day using 232 electric vans

The scenarios then drive a series of output indicators as shown below. At the upper end of the range of outcomes, the capacity of the site itself, as well as the connecting road and rail networks, will limit the scale of operations which might be possible through the site.

	Up to 120 passenger trains and/or up to 7 freight trains used per day.		Up to 15,000 tonnes saved per annum (CO2e).
	Up to 150,000 parcels handled per day.		Up to £30m increase in local business turnover per annum.
	Up to 800 cargobike / van deliveries from site per day.		Up to £2m rates + £5m rent + £0.4m track access per annum.
	Up to 200,000 sq ft of disused floorspace repurposed and commercialised.		Up to £6m user benefits from rail freight use per annum.
	Up to 870 employee positions created on site.		Up to £3m social benefits from rail freight use per annum.
	Up to 230 cargobikes / vans based on site.		Up to £9m total benefits from rail freight use per annum.





The ability for road-based urban logistics to decarbonise at scale and at speed is limited by technology, infrastructure and costs. To achieve significant reductions in emissions, different modes and types of transportation will be needed going forward.

This will require additional infrastructure within London, with sufficient floorspace and suitable multi-modal transport access. Without such sites, London's ability to decarbonise its "always on" economy will remain limited.

Where space and access permit, innovative and disruptive solutions can be delivered to address these challenges, including repurposing seemingly long-lost ideas - from the humble delivery bike and electric milk float, to using stations and trains for freight.

Development of a local freight and logistics hub at Waterloo, using vacant space below the passenger concourse, could help provide the infrastructure which, in turn, would allow users and operators to switch to smaller electric / zero-emission delivery vehicles.



Waterloo Station undercroft, Lower Road  
looking towards Waterloo Road

The social benefits include cleaner and quieter deliveries with smaller vehicles, along with new and healthier employment opportunities, as well as a trickle-down of increased local logistics activity into the surrounding business and residential hinterland.

The economic benefits include longer-term savings in logistics costs to operators and their customers; new income streams for Network Rail and train operators; new employment and business activities and associated business rates; and indirect savings in costs associated with areas such as traffic congestion, accidents, health and deprivation.

The extent to which the potential scale of these benefits is realised in practice will require careful and considered co-ordination of various potential stakeholders, to open up the under-utilised Waterloo Station undercroft.

Subject to commercial and operational engagement between Network Rail and its tenants (whether existing train operators or new logistics providers), the interest from the initial market engagement to date and the generally good condition of the existing vacant space, suggests significant potential to establish multiple operations on site in a matter of weeks and months.

The extent to which the scale of the outcomes is realised in practice will depend on the willingness and appetite of the various potential stakeholders to open up Waterloo station undercroft, in both the speed and scale of implementation.

Subject to commercial and operational engagement between Network Rail and its tenants (whether train operators or logistics providers), the interest from the initial market engagement to date and the generally good condition of the existing vacant space, suggests significant potential to establish multiple operations on site in a matter of weeks and months.

Indeed, it will be important for the prospects of rail freight use to establish a local community of logistics providers and their customers on site, to help grow the critical mass of freight activity needed to generate parcel-load and trainload rail services.

It is recognised that with a significant number of stakeholders, care will be needed with the next steps, to avoid short-term “quick wins,” with specific objectives and outcomes, being frustrated by debates about longer-term proposals or aspirations.

CRP has set an ambitious programme to create initial road and rail operations through Waterloo over the next 12 months, which will involve two main groups of potential key stakeholders:

- **Operational / commercial issues:** CRP, Lambeth Council, Network Rail, LCR, South West Railway and prospective tenants - the focus being on ensuring that any new transport operations do not interfere with the running of the station, and can provide a commercially-attractive proposition for landlord and tenants, within the capabilities of the site itself and the connecting road and rail networks;
- **Strategic issues:** CRP and constituent Borough officers / Members, Network Rail, LCR, South West Railway, GLA/TfL, Waterloo masterplan team and existing station tenants - the focus here being on how best to integrate the new logistics operations within a framework of the London Plan, Borough plans, wider network capacity, and the emerging Waterloo Station masterplan. Note that improving delivery and servicing facilities for freight in the short term, will also support delivery of the wider masterplan in the longer term.



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