

Evaluation of Freight Consolidation Demonstrator Projects

October 2019



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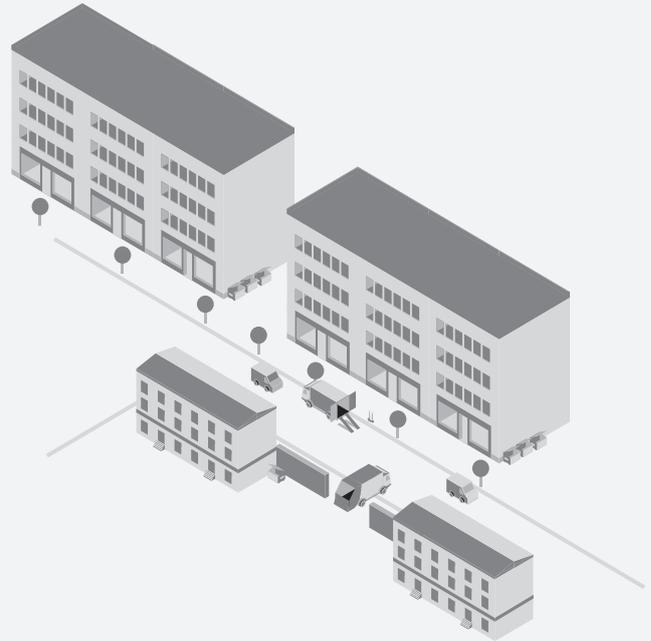
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Executive Summary

Introduction

Transport for London (TfL) commissioned Steer to explore the opportunities and potential benefits of freight consolidation in London. TfL sought to follow 10 demonstrator projects, including some funded by TfL and others funded by external sources. The overarching aim of this project was twofold, to:

- Identify, and where possible quantify, the transport impacts of freight consolidation; and
- Identify 'proof of concept' for the roll-out of various approaches to freight consolidation.

Freight consolidation seeks to combine multiple servicing or delivery vehicle movements into fewer, larger consignments. The goal is simple: reduce the number of (and distance travelled by) freight vehicles by maximising their utilisation. The expected benefits of reduced delivery vehicle mileage are improved air quality, reduced congestion and road danger.



Approach

A framework was used to review the demonstrator schemes and compare their benefits, challenges and opportunities. Steer and TfL developed a set of criteria focusing on the impact of the demonstrators and potential for wider roll out. Steer used information and data collected by the demonstrators themselves to undertake the evaluation, as well as meetings and discussions with demonstrator project teams.

The demonstrators trialled the following approaches to freight consolidation:

- Pedestrian portering as a last mile solution;
- Collaborative procurement – preferred supplier schemes e.g. for office supplies;
- Reducing personal deliveries;
- Transport impacts of facilities/servicing contracts consolidation;
- Waste consolidation;
- Delivery consolidation centres (urban and micro); and
- Technological solutions to capacity sharing.

Key findings

1. Consider commercial waste consolidation: this review found evidence for positive transport impact, stakeholder buy-in and successful implementation and is a potential quick win for freight consolidation.
2. Advocacy and leadership: the most successful demonstrators all had strong advocacy and leadership within the lead organisation, acting on colleagues within the organisation, or partner/member organisations in the case of BIDs.
3. Use existing structures and organisations: successful demonstrators made the most of existing structures and organisations to co-ordinate and drive projects forward, e.g. BIDs, leading to implementation efficiencies;
4. Look to other measures before urban consolidation centres: urban consolidation centres are not necessarily the 'silver bullet' for reducing the transport impact of freight. Other measures such as collaborative procurement or pedestrian portering were considered to be a more effective use of resources than consolidation centres.
5. Align private interests and social benefits: aligning stakeholder's private interests with social benefits is an important factor in ensuring successful implementation of projects. Where there is a potential financial benefit to individuals or organisations as a result of a freight consolidation activity it is more likely to be implemented and to achieve the wider benefits.
6. Scale preferred supplier schemes to be commercially viable: preferred supplier schemes need to offer strong incentives for businesses to switch, such as by offering discounts. Without a sufficient number of businesses signed up, the viability of a preferred supplier scheme can be limited because they lack economies of scale.

The evidence considered as part of this review suggests the following freight consolidation activities should be prioritised:

- Waste consolidation;
- Reducing personal deliveries;
- Pedestrian portering; and
- Preferred supplier schemes.



Further research

There are some aspects that would merit further consideration and research:

- The potential to utilise the empty leg of delivery vehicle journeys to pick up waste, e.g. cardboard and other recyclables, as already takes place among large/chain retailers and it would be useful to know what scope there is to expand this to other businesses or organisations that supply a number of different retailers or organisations.
- Research to quantify the transport-related impacts of personal deliveries being re-directed from central London. Rerouting personal deliveries may have a positive impact on local traffic and air pollution in central London, but research is needed to establish whether it displaces delivery vehicle mileage to other areas and thus whether there is a net reduction in emissions, congestion and local air pollution.
- There was not enough evidence available to allow a conclusion to be drawn on the concept of working with schools / the education sector. Further research is needed to explore the potential transport impacts and viability of the concept.



Acknowledgements

Steer and Transport for London would like to thank the demonstrator project leads and partner organisations for their help and participation throughout this review.

Introduction



Background

Freight has an essential role in supporting economic activity¹. In London, freight is estimated to directly contribute £7.5bn to the city's economy². 90 per cent of London's freight is transport on the road network and the number of LGV movements increased by 54 per cent between 1993 and 2017³. Servicing and delivery vehicles contribute to congestion, poor air quality and road collisions.

By 2041 it is estimated there will be an additional two million more people living in London, making an extra six million journeys every day⁴. The Mayor's Transport Strategy (MTS) published in March 2018 sets out a vision for a London that is not only home to more people, but is a better place to live, work and visit. The strategy sets a target of having 80 per cent of personal trips in London made on foot, by cycle or using public transport by 2041. To deliver this the experience for people using London's streets is to be improved. The Healthy Streets Approach provides a framework for delivering this improvement, through a focus on increasing priority for walking and cycling.

The Freight and Servicing Action Plan is a subsidiary document to the MTS and sets the policies and actions required to support a safe, clean and efficient freight system. It recognises the importance of accommodating freight and servicing trips with adequate loading space and lower congestion, and at appropriate times. Partnership working and the involvement of the whole supply chain will also be essential to make more efficient use of London's street network.

¹Vivid Economics for the National Infrastructure Commission, 2019, The value of Freight

²Transport for London, Freight and Servicing Action Plan.

³ibid

⁴ibid

Project aims and objectives

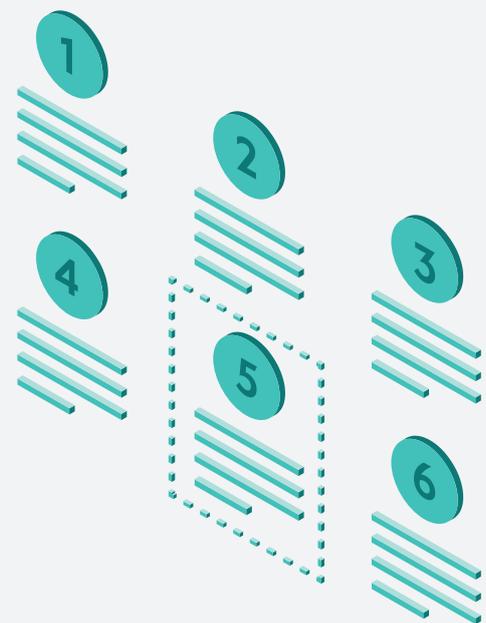
In 2017, Transport for London (TfL) commissioned Steer to carry out this evaluation project to explore the opportunities and potential benefits of freight consolidation in London, and the extent to which it can support more sustainable and efficient deliveries and servicing. TfL sought to follow 10 demonstrator projects, including some funded by TfL and others funded by external sources. The overarching aim of this project was twofold, to:

- Identify, and where possible quantify, the transport impacts of freight consolidation.
- Identify 'proof of concept' for wider roll out of a range of approaches to freight consolidation.

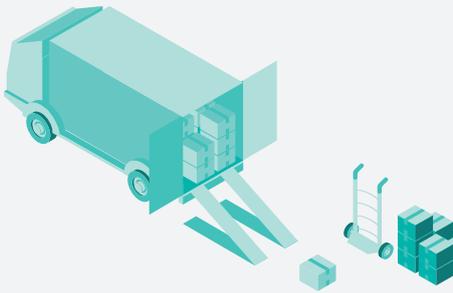
The project also aimed to help TfL identify the role it, and partners, can play in encouraging more freight consolidation activities and reducing delivery vehicle miles travelled.

The evaluation used data and information provided by the demonstrator projects. The evaluation also discussed with the leaders of each project how it was implemented, the challenges encountered, and lessons learned. Due to the nature of the demonstrator projects, this evaluation drew on existing data and any data collected by the project leaders to understand the impacts. The evaluation did not commission independent data collection.

This report summarises the results, lessons learned and implications for wider roll-out from 10 freight consolidation demonstrator projects undertaken in London.



Freight consolidation & its potential benefits



Freight consolidation seeks to combine multiple servicing or delivery vehicle movements into fewer, larger consignments. The goal is simple: reduce the number (and distance travelled) of vehicles carrying freight in the city by maximising their utilisation. The expected benefits of fewer delivery vehicle miles are:

- Reduced congestion on the road network;
- Improved air quality; and
- Reduce road danger.

Roles and responsibilities

Across the demonstrator projects there was a range of agents with different roles and responsibilities:

- Each demonstrator was led independently from Steer's evaluation with an individual or team responsible for management and direction of each initiative.
- Steer was appointed to review the progress and achievements of the demonstrator projects. Steer used information and data collected by the demonstrators themselves to undertake the evaluation, as well as meetings and discussions with the project teams.
- Separately to this evaluation project, Steer was appointed as consultants to the Northbank Business Improvement District (BID), the lead delivery partner for the TfL funded demonstrator project at Somerset House. In all cases Steer acted impartially, reviewing the demonstrators on their individual merits and the information available.
- TfL provided overall sponsorship of the evaluation, identifying projects to form part of the evaluation and appointing Steer to work with the demonstrator projects to identify methods, achievements and lessons learned.
- Two of the demonstrator projects were funded, managed or delivered by TfL.

Report structure

The remainder of this report is structured as follows:

Chapter 2: Methodology

Chapter 3: Key findings and experiences of the demonstrator projects

Chapter 4: Conclusions

Chapter 5: Recommendations

Methodology

Overview

Table 2.1: Evaluation framework

Scorable elements

Environmental impact

Traffic / congestion impact

Time required for implementation

Cost of implementation

Customer satisfaction

Achievement of objectives

Effective communication

Ability to roll out

Cost of wider roll out

Non-scorable elements

Challenges encountered / lessons learned

Risk strategy

Governance / decision-making structure

Importance of people or relationships

This chapter presents the methodology that has been used to evaluate the demonstrator projects. The evaluation used data and information provided by the demonstrator projects and discussed with the leaders of each project how it was implemented, the challenges encountered and lessons learned. This evaluation drew on existing data and any data collected by the project leaders to understand the impacts. Independent data collection or monitoring was beyond the scope of this evaluation.

Evaluation framework

A consistent framework was used to review the demonstrator schemes and a comparison of their relative benefits, challenges and opportunities. Steer and TfL developed a set of criteria focusing on the impact of the demonstrators, governance and potential for wider roll out. The framework is shown in Table 2.1.

The framework contains a mix of quantitative and qualitative criteria. For the elements that can be assessed quantitatively, each demonstrator has been awarded a score based on two aspects, to ensure a balanced assessment:

- Level of change or impact on a scale of 1 to 5 (where 1 = low impact and 5 = high impact)
- Robustness of the evidence provided on a scale of a to c (where a = more robust and c = less robust)

The type of change or impact varies across the scorable criteria, for example a score of 4 under 'effective communications' means communications worked well on this demonstrator, or a 2 under 'ability to roll out' means a limited potential for wider roll out. The scoring system is shown in the assessment matrix in Table 2.2 below.

Moderation

Each demonstrator was evaluated against the scoring criteria at different points over the project. Once the data and evidence for all demonstrators had been received, a moderation exercise was carried to ensure scores had been applied consistently across all demonstrators over time. Appendix A details the criteria applied in the moderation exercise under each scorable area.

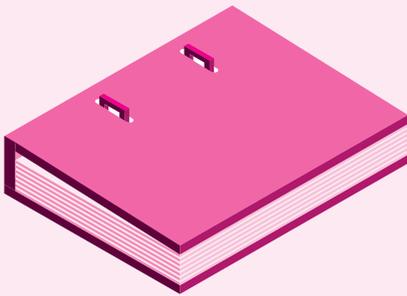
Table 2.2: Evaluation scoring matrix

		Evidence provided			
		Very good	Good	Poor	None
Change from before demonstrator situation	Very high	5a	5b	5c	-
	High	4a	4b	4c	-
	Medium	3a	3b	3c	-
	Low	2a	2b	2c	-
	None	1a	1b	1c	-

The background consists of three overlapping geometric shapes in shades of pink and magenta. A light pink shape covers the top and right portions. A darker pink shape covers the bottom right. A bright magenta shape covers the bottom left. The shapes meet at sharp angles, creating a modern, abstract design.

Demonstrator Projects

The Demonstrator Projects



This section introduces the freight consolidation demonstrator projects. It includes three sub-sections:

- A summary table introducing each demonstrator, the key partners involved in delivery, an overview of the outcomes of the project (Table 3.1);
- A table presenting the scores of each demonstrator on one page; and
- A more detailed 'fact file' on each demonstrator.

Ten demonstrator projects were chosen for this evaluation, based on research commissioned by TfL⁵ in 2015 to identify, review and analyse the various consolidation solutions used within the UK and internationally. A range of consolidation initiatives were selected as detailed in 3.3 below, for project development and delivery. In some cases, the same technique was tested with different stakeholders as the learnings and approach would vary considerably.

These demonstrator projects can be categorised according to the consolidation approach being trialled in each case:

- Pedestrian portage as a last mile solution (ED1)
- Collaborative procurement (ED2, ED3, ED5, ED9a, ED9b)
- Reducing personal deliveries (ED3, ED4, ED5)
- Consolidating facilities and servicing activities (ED3, ED4)
- Waste consolidation (ED5, ED10)
- Urban consolidation centres (ED7, ED8)
- Micro-consolidation (ED9a, ED9b)
- Technological solutions to capacity sharing (ED6)

⁵Increasing Consolidation Project Report – July 2015 TfL

Table 3.1 summarises each demonstrator, an overview of the experience of implementation, an assessment of the viability of the concept and potential to be rolled out elsewhere. In some cases there was a divergence between the practical, empirical experience of the demonstrator within our assessment programme, and the wider viability or potential of the concept underlying it. For example, a demonstrator may have not got off the ground due to staffing issues, or local circumstances, however the concept may have potential elsewhere or under different circumstances.



Table 3.1: Summary of the demonstrator projects

Code	Demonstrator	Approach being tested	Delivery Partners	Summary Description	Implementation experience	Viability of concept
ED1	Pedestrian Porterage	Pedestrian porterage as a last mile solution	Gnewt Cargo, University of Westminster, Southampton University	Vans were used to distribute consignments to pedestrian porters at a number of fixed locations. Porters then distributed parcels on foot to recipients. This was a small-scale pilot undertaken in Southwark and the City of London.	Well-executed demonstrator, however limited data from two-day trial	Good viability of pedestrian porterage, potential to carry out more extended trials and roll out more widely
ED2	Education Sector	Collaborative procurement	Transport for London	Pilot project to consolidate deliveries across three schools in close proximity to each other .	Demonstrator did not get off the ground due to limited resources in schools to engage with the project	There is not enough experience from this demonstrator to allow a conclusion to be drawn on the concept
ED3	Delivering Better Air – Freight Consolidation at Somerset House	Collaborative procurement Reducing personal deliveries Consolidating facilities and servicing activities	Northbank BID, Somerset House Trust, Steer	Somerset House hosts over 200 small and medium businesses working in the creative sector. The project sought to reduce delivery and servicing vehicle movements across staff personal deliveries, food and beverage outlets, couriers and office supplies.	Engaged project leaders and target audience, supported by time and resources among the landlord, BID and consultant team implementing the project	Good viability to reduce delivery and servicing vehicle trips evidenced by this demonstrator
ED4	'One TfL' Logistics Demonstrator	Transport impacts of large-scale consolidation of Facilities contracts Reducing personal deliveries	Transport for London	This project had two aspects. Firstly, assessing transport impacts of a wider initiative within TfL to consolidate Facilities supply and servicing contracts across several TfL locations. Secondly, a ban on staff personal deliveries was introduced to reduce the number of delivery vehicles arriving and departing at TfL buildings.	Limited opportunity to consider the potential transport impacts of the contracts consolidation exercise	Some potential to reduce delivery and servicing trips, although the challenges of implementing across large, complex organisations for moderate benefits may outweigh the effort required.

Code	Demonstrator	Approach being tested	Delivery Partners	Summary Description	Implementation experience	Viability of concept
ED5	West End Commercial Vehicle Reduction	Collaborative procurement Reducing personal deliveries Waste consolidation	New West End Company BID, Arup	Project to reduce delivery and servicing vehicles on Bond Street. In the first phase, waste collections were consolidated from 20 different providers. In the second phase, a preferred supplier scheme was introduced for office supplies and an initiative to reduce personal deliveries to staff at Bond Street businesses.	Mixed success across two phases – waste consolidation more successful than preferred supplier – although resources to drive demonstrator forward were more limited in second phase.	Waste consolidation has good viability, while preferred supplier schemes seem harder to implement.
ED6	Capacity Sharing	Technological solutions to capacity sharing	A logistics company and Transport Exchange Group (TEG)	This project sought to improve utilisation of spare capacity in a logistics company's delivery vehicles on their return leg by using an online platform to identify consignments.	Limited opportunities for capacity sharing because most capacity was available on lorries leaving London and most demand was capacity entering London.	Limited viability of capacity sharing in London, as this demonstrator showed a mis-match of demand for shipments and supply of spare capacity.
ED7	Camden Freight Consolidation Centre	Urban consolidation centre	London Borough of Camden	A two-phased pilot project, firstly using an outer London consolidation centre, from which deliveries were transferred to Camden Council locations including offices, schools and libraries. In the second phase, the consolidation centre relocated to a site within the London Borough of Camden, with electric vehicles used for last-mile delivery to Camden Council locations.	Contractual issues hampered implementation in the first phase using an outer-London consolidation centre. The second incarnation, delivered in-house as a micro-consolidation centre, was more successful.	Inconclusive on the concept of consolidation centres, although experience of this demonstrator suggests micro-consolidation more viable than consolidation centres.

Code	Demonstrator	Approach being tested	Delivery Partners	Summary Description	Implementation experience	Viability of concept
ED8	Barnet Decision to Join Camden Consolidation Centre	Urban consolidation centre	London Borough of Barnet	Barnet Council considered joining the first phase of the Camden Consolidation Centre, making use of the centre when it was located nearby in Enfield. This project considered the factors that need to be in place within a large organisation before a consolidation centre can be utilised and its benefits realised.	Project did not get off the ground, although Barnet's decision not to join the centre was informative; they decided to implement cheaper, simpler measures first.	Decision not to join for Barnet suggests use of consolidation centres requires considerable preparation and is possible only after other factors such as procurement have been addressed first.
ED9a	Central London Micro Consolidation	Micro-consolidation	A central London BID	This project introduced a consolidation service for personal deliveries, in which personal deliveries to staff in local businesses were first sent to a micro-consolidation centre before being distributed in one-round to recipients. The project secondly introduced a preferred supplier for daily office essentials for BID members to use.	Signing-up businesses to both elements of the project proved to be more resource intensive than expected. Fewer businesses participated than expected.	There is not enough experience from this demonstrator to allow a conclusion to be drawn on the concept.
ED9b	Grosvenor Micro Consolidation	Micro-consolidation	Grosvenor Estate, Gnewt Cargo, Anglo	The Grosvenor Estate introduced a consolidation service for all personal deliveries and stationery at their head office. Deliveries were intercepted and sent to a micro-consolidation centre before being delivered once a day to staff at the office.	Successful implementation in one medium-sized office building. The role of landlord with sole authority was important.	Good viability of micro-consolidation demonstrated here with deliveries being re-directed from one building but dependent on subsidy from operator/promoter.
ED10	Copeland Park Waste Consolidation	Waste consolidation	Copeland Park	Copeland Park hosts a range of tenant businesses in the arts, creative and hospitality sectors. Compactors for different materials installed like glass and cardboard. A centralised contract for waste collection was set up by estate management and tenant businesses were signed-up to the service via their contracts.	Successful planning and preparation, with implementation due in late 2019.	Tenant businesses signed-up via tenancy agreements and the service is expected to save tenants money and reduce the number of servicing vehicle movements.

Summary of scorable areas

A summary of the evaluation framework scores awarded to each demonstrator is presented in Table 3.2 below. A moderation exercise has been carried out to ensure that these scores are consistent across the evaluation, detail about the criteria used in the moderation exercise is contained in Appendix A.

Table 3.2: Summary of scorable areas

		Environmental Impact	Traffic / congestion impact	Time required for implementation	Cost of implementation	Customer satisfaction	Achievement of Objectives	Effective communication	Ability to roll out	Cost of wider roll out
ED1	Pedestrian Portage	4b	4a	4b	3b	3c	4b	4b	4a	4b
ED2	Education Sector	-	-	1b	1c	-	1b	1b	-	-
ED3	Delivering Better Air – Freight Consolidation at Somerset House	4b	5a	2b	4b	4b	4b	5a	4a	3a
ED4	‘One TfL’ Logistics Demonstrator	2c	2b	4b	3c	4a	3a	3b	3c	3b
ED5	West End Commercial Vehicle Reduction	5a	5a	4a	3a	3b	4a	4a	3b	3b
ED6	Capacity Sharing	2c	2c	4b	5b	2b	2b	3b	2b	3b
ED7	Camden Freight Consolidation Centre	4c	5c	2a	2b	3b	4b	4b	2b	2b
ED8	Barnet Decision to Join Camden Consolidation Centre	-	-	2a	1c	-	-	3b	2b	3b
ED9a	Central London Micro Consolidation	-	-	2a	3b	-	2c	3b	-	-
ED9b	Grosvenor Micro Consolidation	5a	5a	3a	2a	5a	4b	4a	3b	3c
ED10	Copeland Park Waste Consolidation	5b	5b	3a	4b	4a	5b	5a	4a	3b

ED1 Pedestrian Porterage

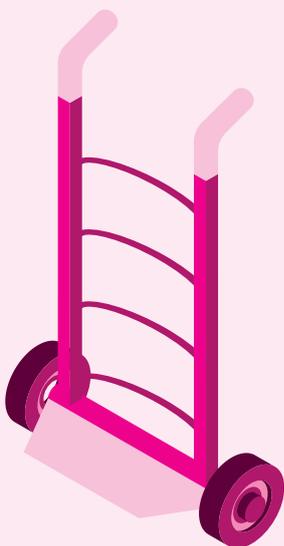
Experience of demonstrator

Delivery vehicle driving time and distance was much lower compared to making individual deliveries by van. Kerbside parking time reduced by 65% and driving time by 71%. Driving distance reduced by 30%.

The second trial used just one driver to serve porters and deliver the parcels rather than two as in the first trial. This increased efficiency and reduced labour time and costs.

Experienced drivers are more efficient as local knowledge and years of delivery experience save time and effort.

The sorting and preparation process was more intensive and time-consuming than expected and is key to making the process efficient.



This project was a small-scale pilot study that took place across two working days in the City of London and Southwark. Vans were used to distribute consignments to pedestrian porters at fixed locations. Porters then distributed parcels on foot to recipients.

One reason this project was chosen to be trialled is due to the relatively short implementation period associated with it, as it had no land acquisition or vehicle adaption requirements. There are also relatively few new staff needed and straightforward communication requirements between drivers and porters.

The evaluation of this project against the assessment framework is presented in Table 3.3. It is important to note that the trial has only been carried out twice, upon which the evaluation is based. A larger scale trial would be necessary to reach strong conclusions on its impact.

Viability of concept

Modelling by the project leaders showed that pedestrian porterage could be rolled out through London's Central Activity Zone (CAZ) and has the potential to reduce delivery vehicle mileage, driving time and kerbside parking time by 80%.

Although the project increased labour time and costs, the modelling of a wider roll-out suggests that costs would be more than offset by reductions in driver and vehicle costs arising from reduced delivery vehicle mileage.

The delivery team considers that the sorting process would need to be human. Although there is a spreadsheet tool developed by the University of Southampton to determine average weight/size, it was discovered that it wasn't always accurate, and the knowledge of an experienced driver was still required to load the van for the trial.

The trial also shows that academic involvement in the preliminary stages was valuable for data collection and processing and the ability to simulate various scenarios and define the necessary premises for the trial.

Table 3.3: Pedestrian Porterage (ED1) Evaluation

Scorable areas

Area	Description	Score
Environmental	No data recorded on pollutants or noise. Driving time and distance was reduced, which would imply that total vehicle emissions also decreased. The reduction in parking time potentially also reduced congestion and therefore had a positive impact on other vehicles emissions. The demonstrator took place in Central London, meaning that this reduced congestion is more likely to have had a positive environmental impact (due to the high density of vehicles).	4b
Traffic / Congestion	Significant reduction reported in kerbside parking time (up to 65%), driving time (up to 71%) and driving distance (up to 30%).	4a
Time required	Trial was quick to set up as it has little capital requirement, i.e. no vehicle adaption or property/land acquisition. Time is required to sort parcels prior to delivery.	4b
Cost	Increased labour time (c.20%+) required for delivery staff, hence costs higher than conventional delivery model.	3b
Customer satisfaction	Level of service for customers remained the same; no feedback, either positive or negative impact from customers.	3c
Achievement of objectives	Project successful meeting three of four objectives: reducing driving time, distance and kerbside parking time, however no specific targets were set. The fourth was to prove that it could be a viable business and operational model, and this is something that may come from further trials and expansion.	4b
Effective communication	A WhatsApp group enabled simple and effective communication between porters, drivers and depot.	4b
Ability to roll out	Modelling of potential roll out across Central Activities Zone (CAZ) shows significant reductions (up to 80%) in driving time, distance and kerbside parking time are possible.	4a
Cost of wider roll out	Modelling of CAZ roll out shows a potential overall reduction in costs, as fall in driver and van costs would outweigh increase in labour costs for porters.	4b

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<p>The importance of experienced drivers and porters to operational efficiency</p> <p>The importance of accurate weight and volumetric information</p> <p>The need for an efficient sorting process through a combination of an automated tool and human knowledge</p>
Risk strategy	<p>No clear risk strategy in place, many challenges were learned through the trial, notably the need for an efficient sorting method and the importance of experienced staff..</p>
Governance / decision-making	<p>There was a good working relationship through the trial. The preliminary work of the academics analysing data and defining the trial was particularly important.</p>
Importance of people or relationships	<p>Research indicates that the experience of parcel delivery drivers (in a non-pedestrian portering operation) has an impact on the efficiency of deliveries in London, with experienced drivers carrying out the deliveries with approximately less driving time, less parking time, less total time and less total driving distance. The pedestrian portering trials made use of both experienced and inexperienced porters and indicated that porter experience also has an impact on the time taken, distance walked and the delivery cost of porters.</p>

ED2 Education Sector

Experience of demonstrator

Identifying the appropriate person within the school to discuss freight consolidation opportunities is challenging, e.g. messages left with reception staff not returned by the school.

An apparent lack of interest among schools on the aims and objectives of freight consolidation, despite the project having potential benefits for school communities and their neighbours.

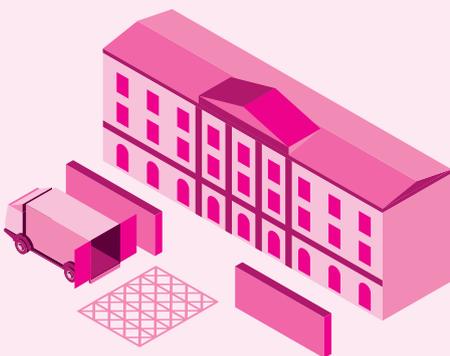
The need for dedicated resources on the side of the project promoter to follow-up with schools and make frequent, repeated engagement attempts, to compensate for limited time and resources at schools.

The original aim of this project was to reduce the noise caused by deliveries to a school in Southwark. The proposed solution comprised TfL liaising among neighbouring schools to set up a consolidated 'preferred supplier' delivery scheme, with the intention of reducing the number of delivery vehicles servicing. Despite several approaches made over a significant period of time, the schools in Walworth did not engage with the potential project.

In another attempt to deliver the demonstrator, a trial area in Vauxhall was identified as a suitable pilot location, with three schools in close proximity being approached by Lambeth Council on behalf of TfL. Consolidation was to take the format of a preferred supplier scheme. However, the project did not progress beyond the engagement stage, as TfL experienced difficulties achieving buy-in through forging relationships with schools.

However, the project encountered significant challenges during implementation, which ultimately meant no deliveries were consolidated among the target primary schools. Consequently, no data is available about the impact of the initiative on the number of vehicle movements. The experience of setting up and implementing the project does however provide insights and lessons learned around the potential of reducing delivery and servicing vehicle movements through working with schools.

The University of Westminster⁶ conducted research into the viability of joint procurement at schools. Their research found that 9% of participating schools already take part in joint procurement, creating the opportunity to generate interest by demonstrating the benefits to other schools.



⁶ Goods Deliveries to London Schools: Current Practices and Opportunities for Consolidation, Marzena Piotrowska, Maja Piecyk and Julian Allen (the results are part of Marzena Piotrowska's PhD research at the University of Westminster, focusing on the role of urban freight consolidation in supporting sustainable urban logistics, as well as part of the FTC2050 project), August 2019

Table 3.4: Education Sector (ED2) Evaluation

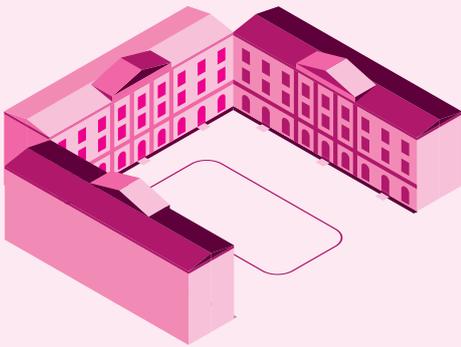
Scorable areas

Area	Description	Score
Environmental	The project didn't progress beyond the initial stages due lack of engagement from schools with TfL. Consequently, no data is available about the impact of the initiative on the number of vehicle movements.	-
Traffic / Congestion	As the project didn't progress to implementation, the impact on traffic/congestion could not be determined.	-
Time required	The project did not progress beyond the initial stages due to schools' lack of engagement with TfL. This was mainly due to a lack of staff resources and time which schools could commit to gathering data and working together across schools to develop the consolidation scheme.	1b
Cost	As the project didn't progress to implementation, the overall costs could not be determined.	1c
Customer satisfaction	As the project didn't progress to implementation, customer satisfaction could not be determined.	-
Achievement of objectives	The scheme's general objective was to reduce freight traffic in the proximity of schools. No quantifiable targets were specified for reducing vehicle movements to schools, and there were no other detailed objectives identified with individual schools. As the project never progressed to implementation stage, these objectives were not achieved.	1b
Effective communication	Schools were generally poor at responding to TfL's communications, owing to a lack of resources, and other issues taking priority. TfL faced a challenge identifying the correct staff within schools. One school was reluctant to engage with any air quality topics owing to the risk of children being withdrawn by parents.	1b
Ability to roll out	As the project didn't progress to implementation, the ability to roll out the project on a larger scale could not be determined. TfL's internal project management led to some inefficiencies due to a bloated management structure.	-
Cost of wider roll out	As the project didn't progress to implementation, the potential cost of wider roll out could not be determined.	-

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<p>TfL's project team was relatively complex and changed through the project. Having a structured project team and method for approaching schools can avoid 'mixed messages' and delays when chasing for follow ups from non-responsive schools.</p> <p>TfL struggled to locate the appropriate contacts within schools to engage with. Schools' data protection concerns amplified this. Schools indicated a lack of resourcing / staff time to commit to setting up and delivering a consolidation operation. Liasing with Multi-Academy Trusts should be considered, as they are likely to have existing staff dedicated to management and procurement across the academy chain.</p> <p>Another approach that should be considered is adapting TfL's STARS scheme, to include efficient delivery and servicing as an accreditation activity.</p>
Risk strategy	Not applicable as the project didn't progress beyond initial stages.
Governance / decision-making	As the project didn't progress beyond initial stages, a governance structure between schools, suppliers, and TfL was not designed.
Importance of people or relationships	<p>Identifying the correct contact to engage with and get buy-in at schools was the critical barrier to developing the consolidation scheme.</p> <p>Similarly, the unstructured approach TfL took to approaching schools prevented a unified vision from being communicated and prevented best-practice to be determined systematically.</p>

ED3 Delivering Better Air – Freight Consolidation at Somerset House



This 18-month pilot project at Somerset House achieved a number of successes, including a reduction in the number of delivery and servicing vehicles recorded by the monitoring survey after one year. A key achievement was a 16% reduction in the number of vehicles associated with the food and beverage outlets on site. There was an overall reduction of 12% in the number of delivery and servicing vehicles from the baseline survey to the one-year follow-up monitoring survey. Other findings and lessons learned from this demonstrator include:

- The important role played by the Somerset House Trust (landlord) in encouraging resident businesses to participate in the demonstrator and change their delivery and servicing behaviour. As the Trust attracts businesses that are interested in environmental and social issues, the project was therefore working with a relatively willing and engaged audience.
- The role played by external project coordinators (the BID and the consultants) and project funder (TfL) in driving the demonstrator forward and working with Somerset House Trust to keep up momentum.
- Food and beverage outlets were interested in consolidating deliveries as part of their wider interest in the provenance of their supplies and the environmental impact of their business. Ingredients are carefully selected on quality and environmental grounds and by extension they were willing to take steps to make the journey from producer to restaurant more sustainable. Communicating these changes to their customers could also benefit these outlets, by improving their reputation as a sustainable business.
- The preferred supplier scheme set up to offer office supplies to resident businesses needed time to become established. Resident businesses could not be compelled to use the preferred supplier (e.g. through their office leases) and uptake was therefore dependent on resident businesses being interested and motivated to change supplier.

Table 3.5: Delivering Better Air – Freight Consolidation at Somerset House (ED3) Evaluation

Scorable areas

Area	Description	Score
Environmental	An estimated 2,855 grams of PM and 43,900 grams of NOx were emitted by delivery vehicles during the two-week baseline monitoring period, with food and beverage deliveries responsible for the most emissions. Post-implementation emissions were not calculated, there was a reduction in delivery vehicle trips which would have created environmental benefits.	4b
Traffic / Congestion	There has been a 12% reduction in total delivery vehicle trips, with a 16% reduction in food and beverage deliveries. The number of deliveries arriving in the morning peak period has reduced, as well as the number of personal deliveries.	5a
Time required	During implementation, time savings were made from being able to utilise Somerset House Trust's existing resources (e.g. an existing mailing list and marketing team). However, additional time was required to obtain sign-off from multiple stakeholders.	2b
Cost	There was a cost to commission Steer to deliver the project. Northbank BID provided 'in-kind' support and project management. Utilising existing resources from Somerset House meant that the only direct cost was the low cost of the stickers placed onto personal deliveries.	4b
Customer satisfaction	The feedback received from the restaurants in Somerset House and their suppliers is positive. As the Trust attracts businesses that are interested in environmental and social issues, by extension they were willing to take part in the initiatives.	4b
Achievement of objectives	The objective of the project was to reduce the impact of delivery and servicing activity at Somerset House. There has been a reduction in total delivery vehicle trips.	4b
Effective communication	The project used clear branding and a communications campaign to reinforce the benefits of the scheme (e.g. workshops, presentations, posters and email). Resident businesses have engaged positively, attending workshops and following up on the actions identified.	5a
Ability to roll out	The success of the scheme and the various ways in which it could be expanded or adapted suggests that there is potential for it to be adopted by other London properties. However, Somerset House is unique in that it is a well-established organisation with businesses interested in the sustainable development agenda, which might not be the case elsewhere.	4a
Cost of wider roll out	Steer was able to utilise Somerset House Trust's existing resources. If the scheme was rolled out in a less established organisation there could be additional costs.	3a

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<p>When there are multiple stakeholders involved in implementing the scheme, ensure to establish lines of communication at an early stage (e.g. the procedures for obtaining sign-off for outputs).</p> <p>Loading bay operating times were changed to accommodate the reduction of peak period deliveries.</p> <p>Where supplier contracts are due for renewal, delivery considerations can be included in decisions.</p> <p>External encouragement and facilitation between companies enables reductions in freight demand.</p> <p>Suppliers themselves can be willing to consolidate deliveries to nearby businesses as it can improve the efficiency of their operation.</p>
Risk strategy	<p>The Northbank BID managed potential project risks by working closely with Somerset House Trust to achieve resident buy-in, seeking engagement with the Trust and regularly engaging with the project funder (TfL).</p>
Governance / decision-making	<p>Somerset House is home to over 400 individual businesses. The project set up preferred supplier schemes for office essentials and outbound couriers for resident businesses to use. While Somerset House Trust could encourage the use of the preferred supplier schemes, it could not compel resident businesses to use them e.g. through their leases. This meant that the decision to use the preferred supplier schemes rested with individual businesses and participation was ultimately voluntary.</p>
Importance of people or relationships	<p>The structure and ethos at Somerset House have helped to embed initiatives. The type of organisations at Somerset House are interested in sustainable development, making them a willing audience for the project. The Somerset House Trust acted as a trusted source for these messages.</p>

ED4 'One TfL' Contract Consolidation and Personal Deliveries Demonstrator

Personal Deliveries to TfL Head Offices



The figure above shows the impact of the ban on the number of personal deliveries, with the dotted line indicating when the ban was introduced (March 2017).

This demonstrator looked at the freight impacts of a contracts consolidation project (One TfL) and a ban on personal deliveries at six TfL head office locations.

Initiated before this freight consolidation evaluation project, the One TfL project sought to achieve efficiencies through the consolidation of contracts across six service areas, with over 300 contracts in scope for consolidation, spanning:

- Communications
- Fire detection and suppression
- Mechanical and electrical maintenance
- Security and reception
- Cleaning services
- Statutory compliance

TfL's consolidation of 50 contracts to six reduced procurement spending significantly, with annual spend reduced by £25m to £115m. There is no quantified evidence for the transport impacts of the consolidation.

Prior to the implementation of the ban on personal deliveries, TfL estimated that personal deliveries accounted for 65% of deliveries at TfL head offices. The ban on personal deliveries was implemented successfully and has become 'business as usual', with 92% of staff aware of the ban on personal deliveries at work. There is some evidence that the rationale and benefits of the ban could have been better communicated to staff in the early stages of the project.

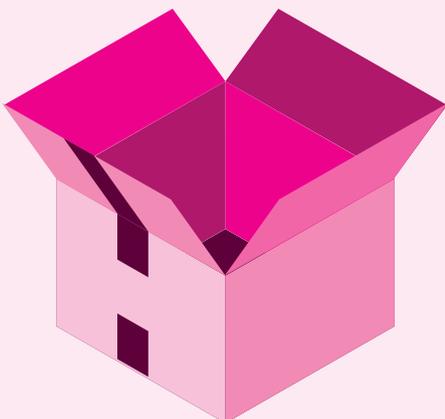


Table 3.6: 'One TfL' Logistics Demonstrator (ED4) Evaluation

Scorable areas

Area	Description	Score
Environmental	There is evidence of reduced personal deliveries to TfL offices, but no data regarding vehicle mileage or change in pollutants.	2c
Traffic / Congestion	There is evidence of a reduced number of personal deliveries to TfL offices, but no data regarding vehicle mileage. Further research would be needed to understand wider effects such as any displacement of delivery vehicles to other parts of London as people choose to have deliveries made to their homes or to local collection points.	2b
Time required	The ban on personal deliveries was implemented within three months of inception. Contract consolidation required six months to implement, and the warehousing and logistics consolidation began in mid-2018 and is ongoing.	4b
Cost	No detailed data provided about the cost of implementation of each project. Savings in the operating cost of procurement have been achieved through the contract consolidation, but resources and costs incurred to deliver the project have not been provided.	3c
Customer satisfaction	Some evidence of discontent from TfL employees regarding the ban on personal deliveries to TfL offices. Some staff disregard the ban; however, a clear majority recognise the importance of the ban and comply. No evidence is provided regarding the performance quality of the consolidated contracts or the London Underground logistics and warehousing consolidation project, although the scope of these contract consolidations is much broader than reducing delivery/service vehicle mileage.	4a
Achievement of objectives	Objectives of the 'One TfL' initiative were to achieve operational savings and reduce vehicle movements, although these objectives were not quantified. There is some evidence that these were achieved, e.g. operational savings from contract consolidation, fewer personal deliveries.	3a
Effective communication	92% of TfL staff were reported to be aware of the ban. No information provided on communications around contract consolidation or warehousing consolidation project.	3b
Ability to roll out	There is some evidence to indicate a personal deliveries ban could be rolled out, but no such evidence regarding logistics and warehousing consolidation, and contract consolidation.	3c
Cost of wider roll out	There appears to be potential to roll out a personal delivery ban elsewhere at relatively low cost, although the evidence provided is limited, and none is provided for the other two schemes.	3b

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<p>Challenges encountered and lessons learned included:</p> <ul style="list-style-type: none"> • Communication of the personal deliveries ban to staff could have been clearer • Some staff still do not respect the ban • Contract management is dispersed across different teams across TfL
Risk strategy	<p>No evidence provided regarding the risk management strategy for personal staff deliveries ban and contract consolidation. The warehousing and logistics consolidation project is being developed in four phases, taking a longer-term view to minimise risk and maximise savings.</p>
Governance / decision-making	<p>Facilities Management staff highlighted the lack of a unified contract management team as a challenge to develop consolidated service contracts, suggesting such a team is created going forward.</p>
Importance of people or relationships	<p>A minority of TfL staff did not believe the ban on personal deliveries to be worthwhile, although compliance is generally high. Post room staff were key to implementing the personal deliveries ban, as they ensured personal items were not delivered to employee desks, instead requiring employees to collect their packages from the post room, using this opportunity to suggest alternative delivery options.</p>

ED5 West End Commercial Vehicle Reduction

Key transport impacts across both elements of the project included:

94% reduction in waste vehicle movements

76% reduction in emissions due to reduced waste vehicle movements

17% reduction in the number of kerbside vehicle stops in 2018 compared with 2014, measured through CCTV.

Unlike households, commercial businesses have to buy waste and recycling collection from private companies, and because they compete against each other, a street or even a building may have multiple companies collecting waste. This increases traffic, air pollution and potentially reduces levels of recycling if non-reputable waste collection companies are used.

This demonstrator comprised a waste consolidation scheme and a preferred supplier scheme for office essentials. The project was implemented by the New West End Company (NVEC) working with consultants Arup and funded by Transport for London. The waste consolidation element was well-received, offering businesses the tangible benefit of reduced waste collection costs. However, uptake among businesses of the preferred supplier scheme was limited and few chose to roll-out the recommended restrictions on personal deliveries among their workforce.

The waste consolidation scheme took approximately three months to set up and 321 businesses had signed up after six months. The preferred supplier scheme took over a year to set up with only 13 businesses having signed up after six months. Commercial tenants were reluctant to share their supply chain related data. For example, it was clear that a small range of bespoke delivery and collection activities were in place for jewellers, galleries, art dealers etc. on Bond Street. Small businesses with very specific supply chain needs may not be best suited to supplier consolidation schemes since there are few supply lines that can be readily shared with others nearby.



Table 3.7: West End Commercial Vehicle Reduction (ED5) Evaluation

Scorable areas

Area	Description	Score
Environmental	A 76% reduction in emissions and a 67% reduction in waste found on pavements was achieved after the implementation of the waste consolidation scheme. No emissions data was provided for the preferred supplier scheme, but further air quality improvements are likely to have been made from the use of electric vehicles and the overall reduction in daily stops made by commercial vehicles.	5a
Traffic / Congestion	A 94% reduction in waste vehicle movements and a 17% reduction in the number of daily stops made by commercial vehicles was achieved after the implementation of both schemes.	5a
Time required	The waste consolidation scheme took approximately three months to set up and 321 businesses had signed up after six months. The preferred supplier scheme took over a year to set up with only 13 businesses having signed up after six months. The nature of office supplies has meant the sale process has been more time consuming than waste consolidation.	4a
Cost	Around £305,000 was spent on the project. 57% was spent on engagement, 22% on supplier selection, 11% on project management and 10% on marketing collateral.	3a
Customer satisfaction	The retention rate has been lower than expected, signalling a potential dissatisfaction with the service. However, no complaints have been received.	3b
Achievement of objectives	The project has reduced commercial vehicle movements, emissions, incidents of waste bags on pavements and achieved some level of behaviour change. We are unable to say whether the target of a 50% reduction in kerbside stops by the end of 2020 will be achieved.	4a
Effective communication	Business engagement strategies were put into place for both schemes. Initial consultation and face-to-face engagement were key. The preferred supplier scheme put an emphasis on Business to Business (B2B) engagement through a range of marketing collateral.	4a
Ability to roll out	The high sign-up rate for the waste consolidation scheme suggests the scheme could be successfully rolled out. Issues around commercial sensitivity may mean that sector-specific solutions are required. It is also important to ensure the multiple initiatives across the West End don't create a confusing landscape.	3b
Cost of wider roll out	There is no indication that there were issues with costs that would prohibit rolling the project out further, but there is little indication of what the costs would be.	3b

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<ul style="list-style-type: none"> • It is easier to consolidate waste than other supplies • Commercial tenants were reluctant to share supply chain data • Project sponsors should always set an example by using the preferred suppliers • Top-down influence from big luxury brands could increase sign-ups • A hierarchal approach to communicating the benefits of the scheme could be beneficial • Personal relationships are more effective than marketing methods such as letter drops • There is a significant distinction between ground-level, and above-ground level businesses
Risk strategy	No clear risk strategy was provided.
Governance / decision-making	<p>The decision-making process for identifying a supplier in the preferred supplier scheme is explained.</p> <p>The overall governance and decision-making structure is not provided.</p>
Importance of people or relationships	Influencing businesses to sign up through personal experience and relationships (e.g. champions/sponsors) was more effective than other methods such as letter drops. Property managing agents should also be worked with to gain access to building occupiers.

ED6 Capacity Sharing



In this demonstrator, a business to business logistics company trialled the capacity sharing platform, Haulage Exchange (HX) developed by Transport Exchange Group (TEG). The platform works by enabling users to post consignments, which haulage firms can then quote to carry, potentially making use of spare capacity on vehicles returning from other deliveries.

TEG has calculated that nationally, their two platforms (Haulage Exchange and Courier Exchange) have saved approximately 514,000 trips, an estimated 54 million miles and each year saves 20,000 tonnes of CO₂. This is, however, primarily from the courier exchange which has a more established marketplace. For example, CitySprint estimated their use of the Courier Exchange saves them 25-40 miles per job, which would have corresponding positive transport and environmental impacts.

The logistics company found that few consignments advertised during their pilot period on HX were suitable for the journeys where they had capacity, typically on return routes from deliveries in London back towards their base in south east London. The limited time period of the trial and the logistics company's focus on the central London to south east London corridor meant that few opportunities were viable, however, this experience should not rule out the potential of capacity sharing to reduce delivery vehicle miles. Further research with other carriers would provide a more comprehensive evidence base to inform conclusions about this approach to consolidation.

Using a platform such as HX in situations where a vehicle is empty on the return leg of a trip appears to be the most viable model for capacity sharing. For example, TEG provide a number of case studies on their website which include positive feedback from customers on being able to reduce empty running. However, in this demonstrator, there was a mis-match of demand and capacity; most demand on the platform was for loads going into central London while most spare capacity was leaving central London.

Experience from this demonstrator also indicates that customers on the HX platform do not like to share vehicles for their consignments, instead expecting a dedicated vehicle. There is also an expectation of a very quick pick up of their consignment, which makes utilising spare capacity later in the logistics company’s delivery rounds challenging. The rules or norms of platforms such as HX need to evolve to allow capacity sharing to become more acceptable.

Figure 3.1: Logistics company’s summary of limitations of capacity sharing for their operations in London

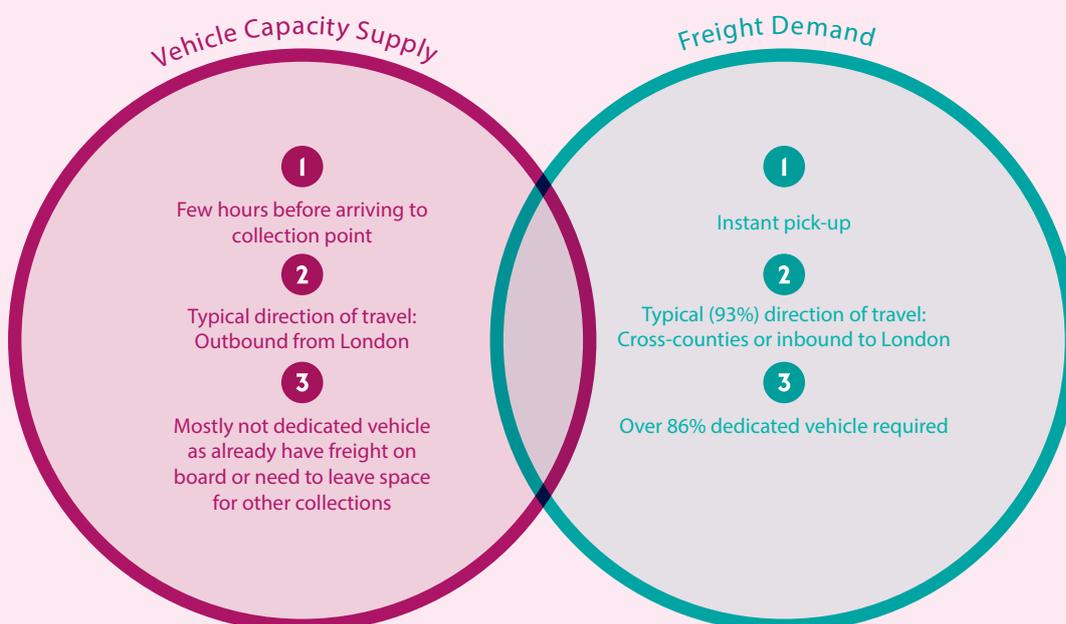


Table 3.8: Capacity Sharing (ED6) Evaluation

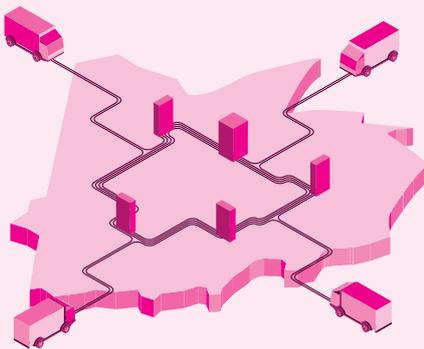
Scorable areas

Area	Description	Score
Environmental	The logistics company did not fulfil any consignments during the pilot. Consequently, no data is available about the environmental impact of the initiative. However, TEG reported there were 39,092 loads starting in London and finishing outside London in the six months to April 2019, approximately 215 per day, and 89,201 starting outside London and finishing in London. TEG has calculated that nationally, the platform saves 20,000 tonnes of CO2 annually. However, there is potential hidden mileage behind these calculations.	2c
Traffic / Congestion	The logistics company did not fulfil any consignments during the pilot so no data is available about the impact on vehicle movements. CitySprint reported a reduction in vehicle mileage.	2c
Time required	The logistics company went from initial decisions regarding two potential platforms in autumn 2018 to piloting TEG's platform in February 2019. CitySprint found the sign-up process straight forward thanks to assistance from TEG's account director.	4b
Cost	TEG's subscription fee during the trial to the logistics company was £200 per month for a minimum of 12 months, resulting in a total first year cost of £2,400. CitySprint reported that ongoing costs are 'very low' and are outweighed by the savings from using the platform.	5b
Customer satisfaction	Transport clerks at the logistics company initially found it challenging to integrate the platform into their work, but this was overcome by assigning a clerk to check email alerts. TEG reported that an API is available enabling integration with users' existing systems, to which the logistics company had access but did not pursue, understandably given this was a trial of the platform only. CitySprint reported that end users are satisfied and there is no evidence of lower service levels.	2b
Achievement of objectives	The logistics company sought to increase productivity, improve utilisation of their assets, reduce delivery costs and increase revenue. These were not achieved as the logistics company did not fulfil any consignments during the pilot.	2b
Effective communication	The logistics company set up an email alert to send information on jobs directly to the transport clerks. However, it was not possible to specify both the origin and destination of the job. The postings also did not provide information on the acceptability of capacity sharing and the load descriptions lacked detail, meaning that the logistics company had to spend additional time filtering out jobs and communicating with potential customers.	3b
Ability to roll out	The demonstrator shows that load sharing has limited application where logistics companies can only offer specific routes for load shares (from central London back to south east London base in this case) TEG data shows there is higher demand for loads going into London than leaving central London. .	2b
Cost of wider roll out	Future changes in London could impact cost, such as the ULEZ charge or upgrading to ULEZ-compliant vehicles, although TEG's platform now includes a 'ULEZ alert', automatically identifying loads that would travel through the ULEZ.	3b

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<ul style="list-style-type: none"> • Most job posters on TEG’s platform currently expect a dedicated vehicle. The rules or norms of the platforms need to evolve to allow capacity sharing to become more acceptable. • The need to clarify weight with job posters added work and delay to the process, although loads are posted according to vehicle requirements. • The existing capacity sharing practices of the operator should be considered, as this could affect the ability for them to offer a cheaper tariff to customers.
Risk strategy	The logistics company considered risks such as unknown end clients and dealing directly with end clients.
Governance / decision-making	The role of the platform provider is to facilitate communication that allows capacity sharing to take place, meaning that decision making on how the platform is used lies with the job posters and logistics operators.
Importance of people or relationships	The logistics company had to have office-based transport clerks monitoring email alerts. The logistics company moved to a system where a dedicated member of staff monitored and responded to the job posts., but as noted above an API is available to users enabling integration with existing systems.

ED7 Camden Freight Consolidation Centre



In the early stages of this project in 2014, the consolidation centre was operated by a major courier company from a warehouse site in Enfield, serving three London borough councils. The project was initially supported using a combination of European Union funding and the Mayor’s Air Quality Fund. When this contract ended, the consolidation centre was moved to a site in Camden in 2018, serving Camden Council only, operating from Mount Pleasant in central London.

When located in Enfield initially, the project involved four suppliers delivering stationery and cleaning products to the consolidation centre for onward distribution to 250 council buildings. At the Mount Pleasant site, the consolidation centre uses a local courier company with electric vehicles to deliver products to council buildings. Camden Council’s analysis of the operations at Mount Pleasant showed a:

- 57% reduction in delivery vehicle trips
- 66% reduction in delivery vehicle miles travelled
- 41% reduction in CO2 emissions
- 51% reduction in NOx emissions
- 61% reduction in PM emissions

However, the detailed calculations behind these figures hasn’t been shared so it hasn’t been possible to verify these impacts.

The key challenge identified by Camden Council was the involvement of an external provider, which initially did not prove financially viable and there was less control over the quality of service. When the council took a greater role in the set up and management of the site at Mount Pleasant it was better able to deliver the service it needed.

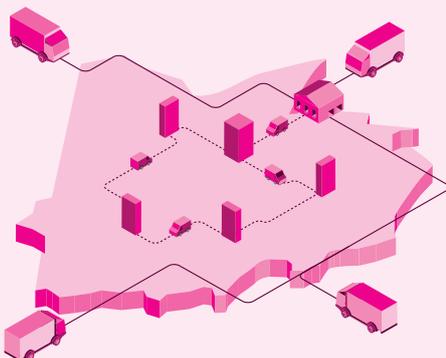


Table 3.9: Camden Freight Consolidation Centre (ED7) Evaluation

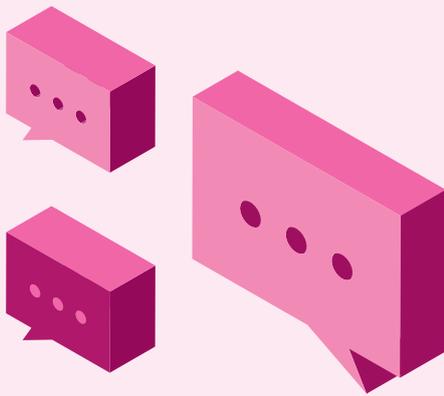
Scorable areas

Area	Description	Score
Environmental	A substantial emissions reduction was reported, although it was not possible to verify the calculations behind the data. All deliveries are currently made using electric vehicles.	4c
Traffic / Congestion	A substantial reduction in the number of delivery vehicle movements and kilometres travelled has been reported, although it was not possible to verify the calculations behind the data.	5c
Time required	Implementing the original consolidation centre in Edmonton took approximately 18 months. The relocation to Camden was carried out in less than two months.	2a
Cost	When using an external provider, the consolidation centre was not financially viable. The project is now financially viable since moving more of the service in-house, but costs are currently preventing expansion of the service.	2b
Customer satisfaction	There were some initial complaints, caused by the way parcels were being stored and delivered by the external provider. Since relocating to Camden, there have been a few complaints regarding delivery delays and communication, but this could be due to the circumstances of having to relocate in a short time period.	3b
Achievement of objectives	Initial objectives of emissions and congestion reductions have been achieved, although the supporting data is not robust. Objectives of financial viability and reduced deliveries at Camden Council's loading bay have been met since the facility moved to Camden,	4b
Effective communication	A lack of awareness from borough stakeholders and management was a problem with the initial consolidation centre. There is now a focus on internal engagement, along with regular meetings with freight and transport bodies. Camden Council plans to continue and to improve the dashboard method of monitoring deliveries.	4b
Ability to roll out	There is room for growth and with the involvement of different solution providers and technologies, the service can become more commercially viable and effective. TfL has suggested that councils should work with Universities, Business Improvement Districts, Hospitals, Offices and Retailers in their local areas to maximise the use of the service. The location of the consolidation centre, funding sources and operation model (external provider or in-house) are important considerations.	2b
Cost of wider roll out	Cost advantages might be achieved from an increase in the number of suppliers or by including additional business services (e.g. group buying, archiving or waste disposal) alongside the consolidation solution.	2b

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<ul style="list-style-type: none"> • When using an external provider, involvement in the project must be profitable for them and appropriately managed by Council or client. In house-operations can be more financially viable and provide greater control. • The costs of joining the consolidation centre should be clearly explained to partners, with a full breakdown on daily activities. • There is scope for negotiation to get customers to pay for the service.
Risk strategy	No clear risk strategy was provided.
Governance / decision-making	No clear description of the governance/decision-making structure was provided.
Importance of people or relationships	The warehouse manager of the existing operation was brought across from DHL and is vital to the operation. Internal stakeholder engagement is important for Camden Council as the consolidation centre focuses mainly on council services.

ED8 Barnet Decision to Join Camden Consolidation Centre



Barnet Council considered joining the first phase of the Camden Consolidation Centre, making use of the centre when it was located nearby in Enfield, but ultimately decided not to join it. The Council identified the following reasons not to join the consolidation centre:

- Consolidated purchasing: there was not a centralised procurement team in Barnet Council, meaning that gaining an understanding of key suppliers and achieving synchronisation of deliveries was challenging. Factors such as devolved procurement, existing contracts with suppliers and existing green procurement policies make changing delivery practices challenging.
- Funding membership: the council looked to discounts from suppliers as a way of paying for membership of the consolidation centre. However, the officer time required to secure discounts from suppliers proved too much and could not be sustained.

Table 3.10: Barnet Decision to Join Camden Consolidation Centre (ED8) Evaluation

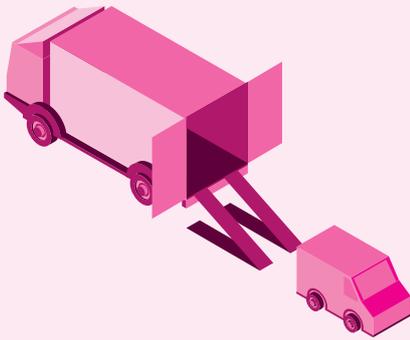
Scorable areas

Area	Description	Score
Environmental	This area is not scoreable as the project did not go ahead.	-
Traffic / Congestion	This area is not scoreable as the project did not go ahead.	-
Time required	Gaining discounts from suppliers to fund a maintained membership of the consolidation centre would require a considerable amount of an officer's time. The office move could present an opportunity to start using a consolidation centre, but the move is a large project and staff appeared to be focused on that.	2a
Cost	There was no further funding available, external or internal, for Barnet Council to maintain membership of the consolidation centre.	1c
Customer satisfaction	This area is not scoreable as the project did not go ahead.	-
Achievement of objectives	This area is not scoreable as the project did not go ahead.	-
Effective communication	A one-to-one explanation for senior managers of what freight consolidation is and a wider circulation of the project details were planned but never took place as the project did not go ahead. The timing of the project has meant that internal stakeholder engagement has been a challenge.	3b
Ability to roll out	Analysis suggests that joining an existing scheme may present some disadvantages compared to self-managing a consolidation centre.	2b
Cost of wider roll out	Cost advantages might be achieved from an increase in the number of suppliers or by including additional business services alongside the consolidation solution.	3b

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<p>The main reasons for the decision not to join the scheme were:</p> <ul style="list-style-type: none"> • There is not one central procurement team in the Council, meaning that gaining an understanding of key suppliers and achieving synchronisation of deliveries has been challenging. • Most procurement in the Council includes purchasing services (rather than goods) which are often packaged to include supplies as part of the contract. This makes changes to these deliveries difficult. • The timing of the project (during a planned move of staff to a new office) has meant that gaining stakeholder buy-in has been a challenge as senior officers are otherwise engaged. • Due to constraints with staff resource time, Re Ltd were not commissioned by Barnet Council until a late stage. • There is no further likelihood of funding to maintain membership of the consolidation centre and constraints with staff resource time prevent further funding from being gained. • There is scope for negotiation to get customers to pay for the service.
Risk strategy	<p>Learning from the experience of others who have joined the Camden FCC, various recommendations were made in the May 2017 feasibility study, such as appointing a Freight Consolidation Project Manager and completing a detailed costs and benefits survey.</p>
Governance / decision-making	<p>The decision-making structure and nature of procurement within Barnet Council was identified as a barrier to joining the Camden FCC. Factors such as devolved procurement, existing contracts with suppliers and existing green procurement policies make changing delivery practices challenging.</p>
Importance of people or relationships	<p>Senior stakeholder awareness and support during commencement stage is identified as crucial.</p>

ED9a Central London Micro Consolidation



The project promoted a service designed to intercept personal deliveries destined for businesses in a central London area, diverting them to a micro-consolidation centre first for onward delivery by electric vehicle. The project aimed for 100 businesses to be signed-up in the first year after launching in 2017. Effective engagement was an essential part of the project, however only five businesses had signed up by early 2018, suggesting it was a challenging process. The approach to signing-up new participants relied upon senior representatives of participating organisations encouraging others to join.

Due to the low levels of participation by businesses at the launch of the scheme, it would not have been statistically robust to measure the project's impact on vehicle trips, delivery mileage, kerbside and air quality impacts. Understanding the transport and air quality impact of the project is therefore not possible.

Challenges were experienced in the selection of an operator for the micro-consolidation of personal deliveries. At the time of initiating the project, no company offered this service as an off-the-shelf solution, which meant that relatively extensive market engagement was required in order to develop a bespoke solution.

Table 3.11: Central London Micro Consolidation (ED9a) Evaluation

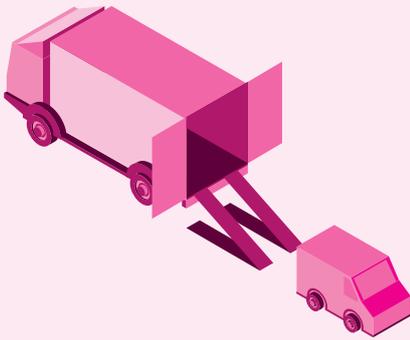
Scorable areas

Area	Description	Score
Environmental	A scoping study did forecast the environmental impact of the Daily Essentials Service. However, due to low levels of participation by businesses at the launch of the scheme, it was not possible to measure the project's impact on vehicle trips, delivery mileage, kerbside and air quality impacts.	-
Traffic / Congestion	A scoping study did forecast the impact of the Daily Essentials Service on vehicle trips and kilometres. However, due to low levels of participation by businesses at the launch of the scheme, it was not possible to measure the project's impact on vehicle trips, delivery mileage, kerbside and air quality impacts.	-
Time required	Engagement and negotiations with potential operators for the Personal Deliveries service was the most challenging and time-consuming part of the project set up. Delays were caused by the operator not having a sufficiently robust tracking technology.	2a
Cost	£180,000 of funding from TfL's Future Streets Incubator Fund was received for the project. The information provided suggests that there were no issues with the proposed fee of the operator for the Personal Deliveries service.	3b
Customer satisfaction	Suggestions of how to assure customer satisfaction were provided, such as providing suitable delivery times or quick resolution of issues, however, no evidence was provided on customer satisfaction with frequency and punctuality of the consolidated services.	-
Achievement of objectives	There was a target of 100 sign ups in the first year, however only five members signed up for the services by early 2018.	2c
Effective communication	Multiple channels of communication were used during the stakeholder engagement period.	3b
Ability to roll out	The project did not accumulate sufficient evidence to recommend that the service could be rolled out elsewhere in an identical format.	-
Cost of wider roll out	Due to low levels of participation by businesses at the launch of the scheme, no evidence can be provided on what costs would be if the scheme was repeated elsewhere, or if any cost efficiencies could be achieved.	-

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<ul style="list-style-type: none"> • The importance of ensuring that potential operators have adequate capabilities and resources • The need to allow sufficient time to identify and select a supplier • The importance of promoting to businesses over the long term and using methods such as satisfaction surveys and feedback to promote and develop the scheme as it progresses • Approach to signing-up new participants was not a successful strategy
Risk strategy	<p>Risk factors were considered in the supplier selection process. The competency guide used for interviewing potential supplier took various risk factors into account and scored potential supplier considering these.</p>
Governance / decision-making	<p>A governance and decision-making structure for the selection of a supplier were in place, but there is no evidence for whether this was useful.</p>
Importance of people or relationships	<p>Effective stakeholder engagement was an essential part of the project and the steps taken are outlined, however the low number of sign-ups suggests it was a challenging process.</p>

ED9b Grosvenor Micro Consolidation



The project consolidated staff personal deliveries and stationery to Grosvenor's head office at 70 Grosvenor Street. The office manages Grosvenor buildings nearby in Mayfair and some further afield in Belgravia. Following a successful trial, Grosvenor appointed Anglo Office Group in partnership with Gnewt Cargo to run the scheme.

Deliveries destined for 70 Grosvenor Street are now consolidated off-site at Bow in east London. There is then a daily consolidated delivery run from the consolidation centre to 70 Grosvenor Street. Deliveries from the consolidation centre to the office are now made using zero-emission electric vehicles.

The scheme did encounter some challenges:

- The pilot sought to extend the consolidated office supplies scheme to tenants of Grosvenor buildings, using tenancy agreements to mandate sign-ups. However, the lawyers or agents reviewing the agreements usually insisted on such clauses being removed, casting doubt on the viability of this approach to securing consolidation.
- From a monitoring perspective, there was an initial challenge to engage staff in the loading bay at 70 Grosvenor Street to collect baseline data on the number of deliveries. However, this was overcome when it was explained to staff the scheme would mean they would need to process fewer deliveries.

Grosvenor and project partners Anglo are developing a commercial model for the initiative to support its viability in the long term. To support the operating costs of the consolidation arrangements, Anglo needs to secure a certain volume of business to enable costs to be offset against the profits from sales. To incentivise more businesses in the local area to participate, Anglo is looking to offer a discount system on its office supplies to local businesses. By encouraging more businesses to sign-up, it aims to achieve better economies of scale, further enhanced by having multiple customers in a small geography.

Table 3.12: Grosvenor Micro Consolidation (ED9b) Evaluation

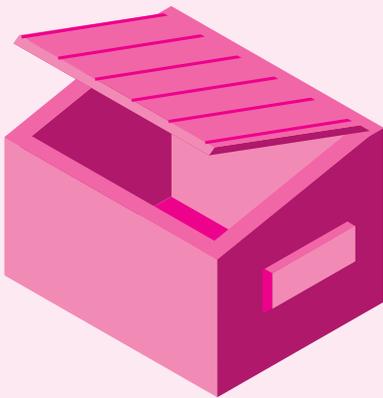
Scorable areas

Area	Description	Score
Environmental	Anglo has estimated that the project has saved 2,700 commercial vehicle movements to the Grosvenor head office between September 2017 and September 2018, creating substantial air quality improvements. All deliveries are also now made on electric vehicles.	5a
Traffic / Congestion	The project has led to a reduction from an average of 21 delivery vehicles per day to Grosvenor’s head office, to just one drop per day from the consolidation centre. Anglo has estimated that approximately 24,000km of vehicle journeys have been saved between September 2017 and September 2018 (92km per day).	5a
Time required	There is no indication that there were any issues with the time required to implement the scheme, although this is not explicitly stated. The timescales provided are reasonable.	3a
Cost	The cost of the project is approximately £26,000 per annum. Anglo currently contribute 3% of their turnover generated by the scheme. There is currently a £18,000 per annum shortfall, which is borne equally by Grosvenor and Anglo. An increased turnover for Anglo from more users of the service would make the scheme more financially viable	2a
Customer satisfaction	Quarterly reviews are undertaken with large customers to assess the performance and service that has been provided. Anglo has not indicated that there have been any issues with customer satisfaction and 90% of Grosvenor head office staff use the service.	5a
Achievement of objectives	The project has had a significant impact on emissions. However, there have been issues with meeting the operating costs and there is no evidence to demonstrate improved security.	4b
Effective communication	A variety of promotional material was used to communicate the benefits of the service, resulting in 90% of head office staff using the service. Meetings with external potential users of the service was initially positive, but conversion to using the service has been identified as a challenge.	4a
Ability to roll out	It has been suggested that there is room to expand the service, to accommodate other deliveries such as Amazon packages. However, there are limits to the services that can be consolidated, due to issues such as limitations in tenancy agreements.	3b
Cost of wider roll out	A wider roll out to more businesses would make the scheme financially viable, as Anglo’s 3% turnover pledge would cover more of the costs.	3c

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<ul style="list-style-type: none">• Engaging loading bay staff to collect data on the number of deliveries• There can be barriers to using tenancy agreements to implement micro-consolidation services
Risk strategy	No risk strategy was provided.
Governance / decision-making	No information on the governance/decision-making structure was provided.
Importance of people or relationships	Systems were put into place to ensure that the service is maintained regardless of any individual's involvement, suggesting that there have been no issues with staff availability.

ED10 Copeland Park Waste Consolidation



This evaluation followed Copeland Park through the feasibility and early set up phase of a consolidated waste collection scheme. By combining businesses' multiple waste collection movements into fewer consolidated collections, the service is forecast to reduce waste collection vehicle movements on site from an average of 30 to five per month). Copeland Park also has a target of ensuring all waste vehicles are Euro VI compliant or use alternative fuels. Fewer waste vehicles on site will also reduce noise and improve safety for tenants and customers at Copeland Park.

There is a relatively high initial capital cost for setting up the scheme because part of the site needs to be modified to accommodate a waste compactor. This combined with staff costs for set up and monitoring leads to an estimated initial investment of £100,000. This investment would be recouped by future savings accrued across the tenants' businesses.

Copeland Park, as landlord, was able to drive the project forward with minimal obstacles. It is expected that using tenancy agreements to mandate use of the consolidated waste service will drive scheme uptake across the whole site, maximising efficiency of the service and delivering the greatest cost reductions to tenants.

Table 3.13: Copeland Park Waste Consolidation (ED10) Evaluation

Scorable areas

Area	Description	Score
Environmental	The consolidated waste service is expected to reduce vehicle movements to the site by as much as 83%. Copeland Park also has a target of ensuring all waste vehicles are Euro 6 / VI compliant or alternative fuelled. Fewer waste vehicles on site will also reduce noise and improve safety for tenants and customers at Copeland Park.	5b
Traffic / Congestion	With the expected reduction in the number of waste vehicle movements, Copeland Park expects to generate a substantial reduction in congestion generated by waste collections to their site; they are also planning to schedule off-peak collections. The ultimate reduction in vehicle kilometres will depend upon which contractor they select to deliver the consolidated service, as contractors' waste processing facilities are varying distances from Copeland Park.	5b
Time required	The project started in September 2018 and has progressed relatively quickly. A vehicle survey, tenant engagement, contractor liaison and waste compactor research have all been conducted. Negotiations are ongoing to select a contractor. Waste facility construction been delayed, rendering construction work unviable until the Autumn.	3a
Cost	Forecast costs for implementation are £100,000. Most costs are for construction of the new waste facility and purchase of compactor.	4b
Customer satisfaction	Tenant engagement concluded that most tenants are supportive of the project, particularly as it has the potential to reduce their costs. Tenants had queries about specialist waste types and ease of access to the waste compactor but are largely supportive of the project.	4a
Achievement of objectives	There is a strong indication that the following objectives will be either achieved or exceeded: <ul style="list-style-type: none"> Reduce collection vehicle visits by half. Appoint a waste contractor utilising 100% Euro 6 / Euro VI or alternative fuelled vehicles. 	5b
Effective communication	Tenant engagement included a survey of all tenants, yielding a response rate of 25%. Larger tenants were also engaged face-to-face, as there was a risk Copeland Park would alienate tenants by imposing a 'top-down' waste consolidation solution without prior consultation. The engagement process has been a success, with broad support from tenants.	5a
Ability to roll out	The project has gathered substantial research and designed a tenant engagement process which has been deemed successful and inclusive. Other sites could apply this methodology. However, factors such as tenant size and mix, and site location within London, would need to be considered to successfully develop a similar waste consolidation service in other locations.	4a
Cost of wider roll out	The research conducted could be applied to other sites, saving cost in developing a consolidation service. However, the specific needs of other sites' would vary the cost.	3b

Non-scorable areas

Area	Description
Challenges encountered / lessons learned	<ul style="list-style-type: none"> • A slightly low response rate to the tenants’ survey, mitigated by direct engagement with key tenants and using vehicle survey data. • Practical challenges with finding a suitable location for the waste compactor on site. • Site managers at Copeland Park going through a learning process around the requirements for waste collection, which delayed engagement with potential contractors.
Risk strategy	No evidence is presented regarding development of a risk strategy for this demonstrator.
Governance / decision-making	Copeland Park, as landlord, was able to drive the project forward with minimal obstacles. It is hoped that using tenancy agreements to mandate use of the consolidated waste service for new and renewing tenants will drive scheme uptake across the whole site.
Importance of people or relationships	Copeland Park, as landlord, has the power to mandate waste consolidation via tenancy agreements. However, they took a careful approach to tenant engagement to ensure buy-in. The project is managed by one individual, which did present a potential business continuity risk to the project, although no issues came of this. The consolidated service is not expected to require significant staff resources going forward.

Conclusions

Evaluation conclusions

The previous chapter summarised the findings from each demonstrator. This chapter draws these together to present the key overarching conclusions across the programme of demonstrators. Recommendations are set out in the next chapter.

1. Consider commercial waste consolidation

Commercial waste is the waste produced from business (or non-household) premises. In this evaluation, commercial waste consolidation combined positive transport impact, stakeholder buy-in and successful implementation.

The two demonstrator projects involving commercial waste consolidation generated significant traffic reductions and environmental impacts, with ED5 resulting in a 94% reduction in waste vehicle movements and ED10 forecasting an 83% reduction in vehicle movements. With the exception of ED9b, these were the greatest transport impacts recorded across all the demonstrator projects. Combined with the viability and relatively low cost of rolling out the concept, commercial waste consolidation is a quick win for freight consolidation.



2. Demonstrate advocacy and leadership

The most successful demonstrators all had strong advocacy and leadership within the lead organisation, acting on colleagues within the organisation, or partner organisations in the case of BIDs.

Using positions of authority was vital in persuading uptake and driving projects forward. In ED3, Somerset House Trust played a crucial role in acting as a trusted source for project messages. The Northbank BID was also important in promoting the project and working with Somerset House Trust throughout implementation. In ED10, the project was progressed relatively quickly as Copeland Park could employ a 'top down' approach as a landlord, by mandating future tenants (and current tenants when they renew) to sign a tenancy agreement including consolidated waste management.

Identifying advocates and leaders is important in driving projects forward. There may be opportunities to achieve these positive outcomes in similar circumstances i.e. where there is a building manager that can influence resident businesses, and a BID or equivalent organisation can guide and encourage the building manager.

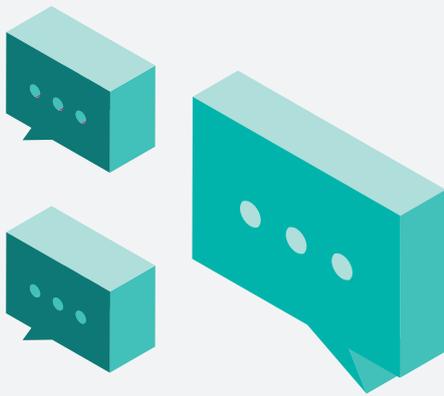


3. Use existing structures and organisations

Related to the previous point, successful demonstrators made the most of existing structures and organisations to co-ordinate and drive projects forward, e.g. BIDs. This can lead to implementation efficiencies; for example, saving time that would have been spent individually reaching out to organisations by utilising Somerset House Trust's existing mailing list in ED3.

Efficiencies were also gained by being able to utilise Somerset House Trust's existing marketing team to carry out communication activities. Using existing staff can also improve the outcome of a project; those involved in ED1 pedestrian porterage reported that the experience of parcel delivery drivers has an impact on the efficiency of deliveries in London, with experienced drivers carrying out the deliveries with approximately less driving time, less parking time, less total time and less total driving distance. In ED1, the trials undertaken made use of both experienced and inexperienced porters and indicated that porter experience also has an impact on the time taken, distance walked and the delivery cost of porters.

Existing structures and experienced staff were key to success in these demonstrators.



4. Look to other measures before urban consolidation centres

Urban consolidation centres are not necessarily the ‘silver bullet’ for reducing the transport impact of freight. Camden Council experienced challenges when setting up and operating a consolidation centre (ED7), with the original set up using an external provider not being financially viable. Since moving to an in-house operation, the project is financially viable, but the high costs of the warehouse and its operating staff are preventing further expansion.

Other measures such as collaborative procurement or pedestrian portering were assessed to be a more effective use of resources than consolidation centres to achieve positive freight impacts:

- Barnet Council (ED8) took the decision not to join the consolidation centre, with a main reason being constraints on the funding available to maintain membership, and the fact that they could achieve positive freight impacts by making their internal procurement more efficient before utilising a consolidation centre.
- Pedestrian portering (ED1) achieved positive freight impacts by sorting parcels at Gnewt’s existing depot in Southwark and then using porters on foot to reduce delivery vehicle traffic. This led to a significant reduction in kerbside parking time (up to 65%) and driving time (up to 71%), demonstrating that positive transport impacts can be achieved without the challenges of setting up a new physical consolidation centre.

5. Align private interests and social benefits

While some projects can be progressed on the basis of social good – for instance, Somerset House restaurants were motivated to reduce their environmental impact in ED3– aligning stakeholder’s private interests with social benefits is an important factor in ensuring successful implementation of projects. For example, in ED10, both the landlord and tenants at Copeland Park stood to save money from the waste consolidation initiative, as well as realising wider transport benefits. In ED9b, Grosvenor and Anglo both benefitted from the micro-consolidation solution as Grosvenor reduced the workload of their staff at the loading bay and Anglo increased their revenue and customer base.

When private interests and social benefits don't align, the incentive for organisations to roll out a consolidation activity is reduced. For example, the logistics company in ED6 (Capacity Sharing) already offered a 'grouping service' to their existing customer base. This meant that it would not have been feasible for them to offer a cheaper tariff for TEG capacity sharing (and therefore benefit from increased revenue), as they were already doing so internally to maximise utilisation. The lack of overlap between their available capacity and market demand ultimately meant that no consignments were fulfilled.

Another example of this lack of alignment is the absence of a personal interest for employees to participate in personal deliveries reductions in their workplace; it relies on them being motivated by social good. On the other hand, the businesses that run offices can benefit from personal deliveries reductions e.g. it can allow them to free up capacity among their loading bay staff. Organisations therefore need to play an active role in encouraging reductions, such as by placing a ban or mandatory re-direct on personal deliveries (ED4, ED9a) or by implementing a behaviour change campaign to emphasise the aspect of social good (ED5, ED3).

6. Scale preferred supplier schemes to be commercially viable

Related to the previous point, preferred supplier schemes need to offer strong incentives for businesses to switch, such as by offering discounts. Without a substantial number of businesses signed up, the viability of a preferred supplier scheme is fragile as they lack economies of scale.

For example, as the preferred supplier in ED9b, Anglo agreed to pay for half of the project cost. The rationale was that Anglo would be able to cover all costs as a result of increased turnover gained through the scheme; they therefore pledged to contribute 3% of the additional turnover generated. However, there was a £18,000 per annum shortfall, meaning that approximately £600,000 of additional sales placed with Anglo would be required to meet this shortfall. Anglo has estimated that this equates to orders from another three or four multi-tenanted buildings. This demonstrates that in the long-term, preferred supplier schemes need increased scale to be commercially viable.

To summarise the key conclusions of this programme of demonstrators:

1. Consider commercial waste consolidation

2. Demonstrate advocacy and leadership

3. Use existing structures and organisations

4. Look to other measures before urban consolidation centres

5. Align private interests and social benefits

6. Scale preferred supplier schemes to be commercially viable

Recommendations

Focus for consolidation activities in the future

This chapter considers the overarching findings from across the programme of demonstrators and makes recommendations about:

Which freight consolidation activities should be prioritised going forward; and

Suggested roles and responsibilities that a range of different agents across the freight and servicing sector should take.

As set out in Chapter 1, this evaluation sought to:

- Identify, and where possible quantify, the transport impacts of freight consolidation; and
- Identify 'proof of concept' for wider roll out of a range of approaches to freight consolidation.

In the light of the evidence from this review, recommendations are made as to freight consolidation activities to prioritise in the future.



Transport impacts of freight consolidation

Returning to the list of consolidation approaches in section 2 and the demonstrators' assessment scores in Table 3.2, the consolidation approaches with the greatest evidence of having a positive transport impacts (i.e. emissions and traffic reductions) are shown below (demonstrators are shown twice where they exemplify multiple consolidation approaches):

Table 5.1: Consolidation approaches with greatest transport impacts

Waste consolidation

	Environmental Impact	Traffic / congestion impact
New West End Company (ED5)	5a	5a
Copeland Park (ED10)	5b	5b

Pedestrian portering as a last mile delivery solution

Gnewt (ED1)	5a	5a
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Consolidating suppliers / collaborative procurement

New West End Company (ED5)	5a	5a
Grosvenor Micro Consolidation (ED9b)	5a	5a
Somerset House (ED3)	5a	5a

Reducing personal deliveries

Somerset House (ED3)	5a	5a
Grosvenor Micro Consolidation (ED9b)	5a	5a

Micro-consolidation

Grosvenor Micro Consolidation (ED9b)	5a	5a
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Based on the evidence from the demonstrators in this programme, the evaluation found less evidence for positive transport impacts from:

Technological solutions to capacity sharing

Capacity Sharing (ED6)	5a	5a
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Collaborative procurement in the education sector

Education sector (ED2)	5a	5a
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Urban consolidation centres

Camden consolidation centre (ED7)	5a	5a
Barnet decision to join consolidation centre (ED8)	5a	5a

Potential for wider roll-out

Across the demonstrator projects that led to positive transport-related impacts, there were varying degrees of ease of delivery (measured by criteria such as cost, set-up time and customer satisfaction). This varied success gives an indication of ‘proof of concept’ and therefore the types of consolidation activities that could be a priority in the future.

Based on this evidence from the demonstrator projects, we recommend that the following the freight consolidation activities should be pursued and promoted on the basis of their potential to roll out as well as providing positive transport impacts:

	Ability to roll out	Cost of wider roll out
Waste consolidation		
New West End Company (ED5)	5a	5a
Copeland Park (ED10)	5b	5b
Pedestrian portering as a last mile delivery solution		
Gnewt (ED1)	5a	5a
Consolidating suppliers / collaborative procurement		
New West End Company (ED5)	5a	5a
Somerset House (ED3)	5a	5a
Reducing personal deliveries		
Somerset House (ED3)	5a	5a

Using the evidence from the demonstrators in this programme as a guide, the list below indicates the possible magnitude of transport impacts if the consolidation approaches suggested above were rolled out across London:

- c.80-90% reduction in waste vehicle movements due to waste consolidation schemes with associated reductions in vehicle emissions.
- c.30% reduction in vehicles miles and c.70% reduction in vehicle driving time from pedestrian portering schemes.
- 12-17% reduction in commercial vehicle trips associated with delivery and servicing from consolidation of suppliers and collaborative procurement initiatives.

Future roles and responsibilities

Transport for London (TfL) and the Greater London Authority (GLA)

TfL as the local government body responsible for London's transport, and GLA as the devolved regional governance body of London, can play key roles in encouraging and facilitating freight consolidation, including:

- Providing guidance for consolidation initiatives: this evaluation project suggests there is a need for guidance for partners managing schemes. Guidance would help partners to identify:
 - the factors they need to have in place before launching a consolidation scheme (i.e. the overarching findings from this report); and
 - what types of initiatives to focus their efforts on (identified earlier in this section).
- Linking to other objectives, programmes and funding streams: promotion of opportunities for freight consolidation through other initiatives and funding streams such as the Mayor's Air Quality Fund and Liveable Neighbourhoods; for example, favouring bid submissions that aim to reduce the impact of freight vehicles on the network.

TfL and GLA are also major employers and purchasers of good and services. Freight consolidation should therefore be considered in the delivery of all major projects; for example, by using a preferred supplier during the servicing of office sites, and restricting personal deliveries to offices.

With TfL having multiple employment sites spread across London, consolidation activities that would be suitable for other large organisations in the public and private sectors would also apply. These are outlined below.

This section makes recommendations on how the various agents involved in freight consolidation can work to reduce freight travel demand in London, building on the successes and 'lessons learned' of the consolidation demonstrator projects.

Businesses and public sector organisations

Businesses and public sector organisations, especially large ones, can achieve significant transport impacts through different approaches to freight consolidation:

- Restricting personal deliveries in the workplace. The restrictions on personal deliveries at TfL in ED4 (and in a smaller context at Grosvenor in ED9b) demonstrate what can be achieved. Other large employers, particularly those with high headcounts at London offices, could help to achieve significant behaviour change by voluntarily implementing restrictions or re-directions on personal deliveries to the workplace. There is also a role within this for organisations to start altering expectations of employees regarding deliveries they can expect at work. The potential benefit that can be accrued to organisations, such as being able to rationalise and free up capacity among loading bay staff, act as an incentive to co-ordinate and drive this forward.
- Consolidating suppliers. TfL's successes with contract consolidation in ED4, which led to an estimated £25m saving per annum demonstrates the incentives for large organisations to promote consolidation activities through internal practice. Although the demonstrator was ostensibly about achieving contract and finance efficiencies, positive transport impacts were achieved too (although it should be noted that the evidence for them was limited).

Business Improvement Districts

BIDs can play a key role in promoting and facilitating freight consolidation.

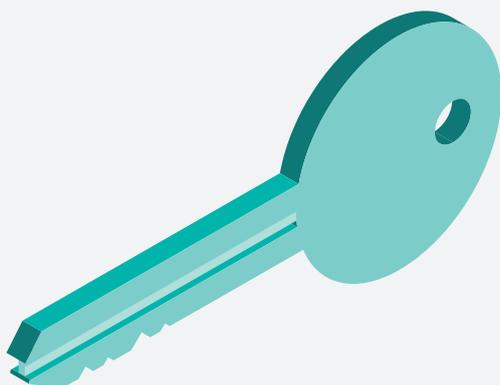
- BIDs should play a proactive leadership and facilitation role. Their position as organisations that are trusted by a network of businesses, which pay into the BID, provides them with a platform to promote services and initiatives that are good for their member businesses. A good example of this is the facilitation role played by the Northbank BID in ED3, who were vital for promoting the project and working with Somerset House Trust throughout implementation.
- BIDs' geographic scale is ideal for consolidation initiatives. BIDs cover defined and usually small geographic areas which, based on the experience of demonstrators in this programme, are well suited to freight consolidation initiatives, such as micro-consolidation, preferred supplier schemes and waste consolidation (ED3 Somerset House).



Commercial landlords

Commercial landlords should:

- Play a similar role in proactive leadership and facilitation of consolidation initiatives as BIDs. Copeland Park (ED10) and Somerset House Trust (ED3) demonstrated this, by leading waste consolidation and delivery retiming/personal delivery reductions/collaborative procurement respectively. Landlords in similar circumstances should lead potential consolidation projects on their sites as the ability to set conditions in tenancy agreements gives them the control to play a leadership role. To complement this, they can also incentivise consolidation initiatives to tenants in terms of cost savings and tangible improvements to the site environment (e.g. less frequent refuse vehicle collections). For example, engagement carried out for ED10 concluded that 93% of tenants were supportive of the project, particularly as it has the potential to reduce their costs.



An interesting counterpoint to the success of Copeland Park and Somerset House is the challenge faced by the Grosvenor Estate (ED9b) in expanding their preferred supplier scheme and micro-consolidation scheme to buildings that they manage beyond their head office (over which they have more direct control). There may be several factors at play affecting the success of their project, which we recommend should be considered by commercial landlords:

- Type of scheme: waste consolidation seemed to be more readily received than preferred supplier schemes. Somerset House facilitated consolidation of suppliers between tenants rather than imposed it.
- Type of tenants: The prestigious creative location of Somerset House, their longstanding relationship with tenants, and the type of tenants (environmentally- or socially-minded) was likely to have increased their ability to leverage change. Copeland Park hosts several start-up businesses; the high turnover of tenants associated with this made it easier to include a preferred waste contractor in tenancy agreements. The Grosvenor Estate mostly contains high-end commercial properties, where these advantages might not be realised
- Different levels of competition: the central London property market is more highly competitive than the market for space at Copeland Park, meaning that Grosvenor's tenants are potentially more sensitive about new conditions in their tenancy agreements, and willing to look elsewhere.

Innovators and technological solutions providers

Innovators including new entrants and established organisations are developing solutions to the challenges of efficient freight movement; following the ED1 portering pilot, Ford and Gnewt have partnered in a pilot for last mile deliveries in the City of London using Ford's MoDe:Link routing software to combine van deliveries with pedestrian porters⁷.

The capacity and load sharing platforms seen as part of this evaluation project in ED6 hint at the potential for making use of empty space on delivery vehicles. However, the pilot project experienced some challenges in integrating the platform with their existing systems.

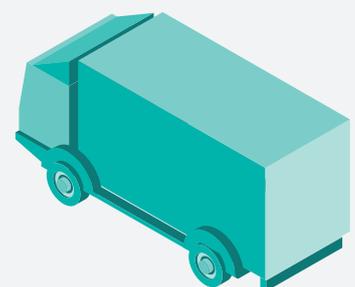
Going forward, innovators and technology providers should focus their efforts on:

- Developing platforms which save individuals, businesses, or public sector organisations time, money or effort, and which are easily operated and accommodating to the needs of the end user. This recommendation is rooted in the wider context of limited funding and market forces driving freight decisions in London. They should consider how their platforms can incentivise freight consolidation or behaviours which minimise the impact of freight traffic, whilst providing private benefit too where possible. For example, ED9a experienced delays in the implementation of its micro-consolidation solution as a bespoke tool to sort packages and plan the route needed to be developed as one didn't already exist. ED1 relied on experienced drivers knowing the route, but an efficient technological solution to plan the rounds would have got around this reliance on experienced individuals.

Freight operators

Experience from across this evaluation project points to a couple of key areas in which freight operators should be proactive to support consolidation efforts:

- Identifying suppliers in common between nearby customers: discussions between tenant restaurants at Somerset House (ED3) identified that they shared food suppliers, who delivered at different times of day, therefore duplicating visits to the site. If the supplier / freight operator had identified this sooner from their delivery rounds, it would have shortcutted this process and enabled consolidation of deliveries without the need for discussions between tenants.
- Accelerating the introduction of low emission fleets: demand for low emission delivery vehicles is increasing among customers, at the same time as regulation mandating clean vehicles is tightening, e.g. Ultra Low Emission Zone in central London. Freight operators should be proactive and pre-empt public sector regulation or mandates to bring in cleaner fleets, which could, for example, help them win tenders over a competitor with an older fleet.



⁷ Source: https://media.ford.com/content/fordmedia/feu/gb/en/news/2019/02/18/ford_s-new-take-on-getting-parcels-to-your-door-could-help-speed1.html

Further research

Table 5.2: Summary of agents' future roles and responsibilities

Agent	Key roles and responsibilities
TfL and GLA	Provide guidance for consolidation initiatives Link to other objectives, programmes and funding streams
Businesses and public sector organisations	Restricting personal deliveries in the workplace Consolidating suppliers
Business improvement districts (BIDs)	Should play a proactive leadership and facilitation role BIDs' geographic scale is ideal for consolidation initiatives
Commercial landlords	Should play a proactive leadership and facilitation role
Innovators and technological solutions providers	Developing platforms which save individuals, businesses, or public sector organisations time, money or effort
Freight operators	Identifying suppliers in common between nearby customers Accelerating the introduction of low emission fleets

There are some aspects that would merit further research to explore the potential transport impacts and viability as an approach to freight consolidation:

- Utilising the empty leg of delivery vehicle journeys to pick up waste, e.g. cardboard and other recyclables. We understand this already takes place among large/chain retailers and it would be useful to know what scope there is to expand this to other businesses or organisations that supply a number of different retailers or organisations.
- Research to quantify the transport-related impacts of personal deliveries being re-directed from central London. Rerouting personal deliveries almost certainly has a positive impact on local traffic and air pollution in central London, but research is needed to establish whether it delivers a net improvement on emissions, congestion and local air pollution in inner and outer London.
- There was not enough evidence available for ED2 to allow a conclusion to be drawn on the concept of working with schools / the education sector. This merits further research to explore the potential transport impacts and viability of the concept to understand which factors in the ED2 demonstrator were locally-specific and which would apply more generally when working with the education sector.

Appendix A

Criteria applied in scoring moderation

Evidence quality	Environmental Impact	Traffic / congestion impact	Time required for implementation	Cost of implementation	Customer satisfaction	Achievement of Objectives	Effective communication	Ability to roll out	Cost of wider roll out
A	Impact evidenced with detailed air pollution data / analysis	Evidenced after-the-fact quantified impact on vehicle kilometres and kerbside impact	Detailed evidence regarding timescales for mobilisation, implementation, monitoring and engagement, and changes / obstacles	Detailed evidence regarding cost of implementation and changes / obstacles	Quantified evidence of stakeholder buy-in, end-user satisfaction / feedback	Quantitative objectives defined and progress reviewed with qualitative and quantitative evidence.	Extensive and/or quantified evidence of communications strategy, dispute resolution, marketing and engagement achieving buy-in from stakeholders	Detailed evidence of "repeatability" of project, constraints, limitations, location	Detailed evidence of "repeatability" of project and its phases with regard to costs and risks
B	Pollution & noise impact extrapolated from well-evidenced reduction in vehicles	Some quantification of actual or projected vehicle kilometres and kerbside impact	Evidence explaining quantified timescales for overall project, changes and obstacles	Evidence quantifying costs of some elements of project	Some evidence of stakeholder buy-in, end-user satisfaction / feedback	Objectives defined and progress reviewed with qualitative evidence	Some evidence of communications strategy, dispute resolution, marketing and engagement achieving buy-in from stakeholders	Evidence of "repeatability" of some elements of the project, constraints, limitations, location	Some evidence of "repeatability" of some elements of the project with regard to costs and risks
C	Vague or poor quality evidence of impact on noise & pollution	Vague or poor quality evidence of impact on vehicle kilometres and kerbside impact	Incomplete or vague evidence regarding timescales	Incomplete or vague evidence regarding costs	Vague or poor quality evidence of stakeholder buy-in, end-user satisfaction / feedback	Objectives not defined and/or progress reviewed with vague or insufficient evidence	Vague or poor quality evidence of communications strategy, dispute resolution, marketing and engagement achieving buy-in from stakeholders	Vague or poor evidence of "repeatability" of the project, constraints, limitations, location	Vague or poor evidence of "repeatability" of the project with regard to costs and risks

Evidence quality	Environmental Impact	Traffic / congestion impact	Time required for implementation	Cost of implementation	Customer satisfaction	Achievement of Objectives	Effective communication	Ability to roll out	Cost of wider roll out
5	Very high change in expected or recorded pollutants and/or noise	Very high change in expected or recorded vehicle kilometres, kerbside impact, vehicle trips	Project implemented in whole in ~6months or less	Costs under £50,000 or exceedingly below expectations	Very high and consistent uptake, high approval from end users, suppliers and stakeholders	All stated objectives achieved and/or most objectives exceeded	Engagement was thorough and detailed with high uptake, marketing clear and very well received by stakeholders and end users	Project has received universal acclaim / feedback, could be rolled out / repeated with basic further planning	Project could be rolled out / repeated with predictable, low costs, with efficiencies identified
4	High change in expected or recorded pollutants and/or noise	High change in expected or recorded vehicle kilometres, kerbside impact, vehicle trips	Project implemented in part in ~6months or less	Costs under £100,000 and/or somewhat under expectations	Broad uptake, high approval from end users, suppliers and stakeholders	Most stated objectives achieved and/or some objectives exceeded, and/or a general conclusion that scheme has been successful	Engagement was good with good uptake, marketing clear and positively received by stakeholders and end users	Project has received positive feedback, could be rolled out with some obstacles / modest planning	Project could be rolled out / repeated with predictable, modest costs
3	Modest change in expected or recorded pollutants and/or noise	Modest change in expected or recorded vehicle kilometres, kerbside impact, vehicle trips	Project implemented within 12 months	Costs under £250,000 or somewhat higher than expectations, or increased operating costs from baseline	Modest uptake, mixed approval from suppliers and stakeholders	Achievement of some objectives and non-achievement of others	Engagement was modest with some uptake, some marketing, mixed reception by stakeholders and end users	Project has received mixed feedback, could be rolled out with further committed planning	Project could be rolled out / repeated with sight of riskier or high costs
2	Low change in expected or recorded pollutants and/or noise	Low change in expected or recorded vehicle kilometres, kerbside impact, vehicle trips	Larger project implemented within 18 months, or smaller project delayed substantially beyond expectations	Costs substantially beyond expectations or £250,000+. Heavily increased operating costs from beyond baseline	Limited uptake and/or significant negative feedback from suppliers and stakeholders	Achievement of a minority of objectives	Engagement was poor, communications strategy contains significant weaknesses, mixed reception by stakeholders and end users	Project has received major dose of negative feedback and would require significant further work to roll out / repeat	Project could be rolled out / repeated but not without high costs / risks to budget controlled
1	No change in expected or recorded pollutants and/or noise	No change in expected or recorded vehicle kilometres, kerbside impact, vehicle trips	Project stalled or abandoned in whole	Uncapped costs leagues beyond expectations, financial collapse / cancellation	Consistently poor uptake negative feedback from end users, suppliers and stakeholders	No objectives achieved	Engagement weak or non-existent, leading to opposition or widespread confusion among stakeholders and end users	Project cancelled / unviable to roll out / repeat	Project cancelled / unviable to roll out / repeat due to high costs



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