

Construction Freight – promoting the adoption of best-practice measures

Quantify and publicise the road network, environmental, safety and other benefits of Works Master Planning’s innovative best-practice construction freight measures. Promote their adoption by TfL and by developers.

Background:

The purpose of this report is to review and quantify the operational, environmental and safety benefits of a range of innovative construction-related measures led by Works Master Planning (WMP) and Michael Barratt, in particular. Several measures have been utilised such as use of share HGV holding facilities, local on-site crushing, recycling of demolition materials, sharing of materials between sites, the effective use of site marshals and the use of cargo bikes.

Over the past few years Michael Barratt has worked with several property developers to develop, pilot and implement a range of best-practice construction-related measures that can contribute to a reduction in the volume of freight HGV construction traffic on the road network, reduce freight km travelled, reduce emissions, improve safety around construction sites, as well as a reduction in operator costs and benefits to the developer.

Where appropriate, these measures should be adopted by TfL for its own construction projects and TfL should ensure that these measures are incorporated into Construction Phase Plans (CPPs) for construction activity that is undertaken by third parties on and adjacent to the TLRN, from carriageway works to major developments, and where appropriate incorporating into traffic management handbook.

Problem statement

Lorries and vans play a pivotal part in London's economy and are a necessary part of construction. Since 2010, the movements of goods vehicles have increased by approximately 20%, which is negatively impacting the environment, public health and the potential safety of many road users, particularly pedestrians, cyclists and motorcyclists.

Research shows that HGVs are involved in 63% of fatal collisions with cyclists, and 25% of fatal collisions with pedestrians despite HGVs only making up 4% of the overall miles driven on London's roads. 20% of road collisions are caused by tiredness and stress, therefore it is of great importance that we ensure all HGV management methods are robust and efficient to reduce any negative outcomes from prolonged driving.

Case Studies (led by Michael Barratt):

Local on-site crushing:

Transport for London (TfL) is keen to reduce HGV traffic on the road network especially during major construction projects. To minimise such disruption, TfL will support and promote on-site recycling where practicable.

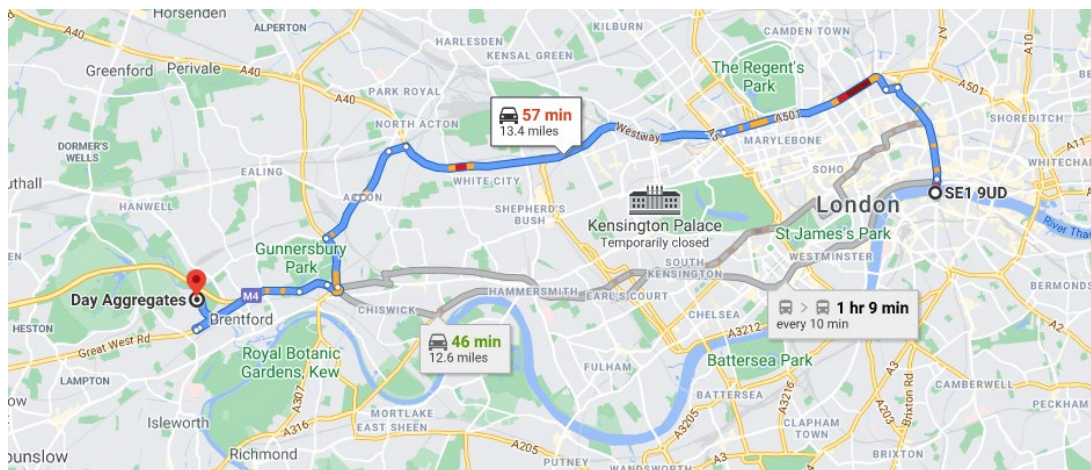
It is important to reduce the need for HGVs as much as possible on all road networks. Recycling demolition arising is one method that can assist.

There are opportunities to reuse demolition arising on site (rather than removing) such as crushed concrete (6f2) for piling mats. Transport for London (TfL) is keen to encourage and support this method and works closely with all impacted stakeholders to mitigate any concerns including noise and dust suppression techniques. However, this tends to be on a site by site basis and will require specific measures to support crushing on site e.g. dust and noise suppression.

18-23 Blackfriars Road (One Blackfriars)

After receiving TfL’s preferred direction, the development site on Blackfriars Road managed to crush demolition arising (6f2) on site and has stored for use as the piling mat (totalling 7000m³ – 14,7000t).

Calculation Conversions	
HGV Greenhouse Gas Conversion Factor	2.66 per km*
6f2	2.1 tonnes per m ³
Ave load	18 tonnes (per 32t gross tipper)



Based on the shortest and quickest route to the potential aggregate recycling site (Day Aggregates)

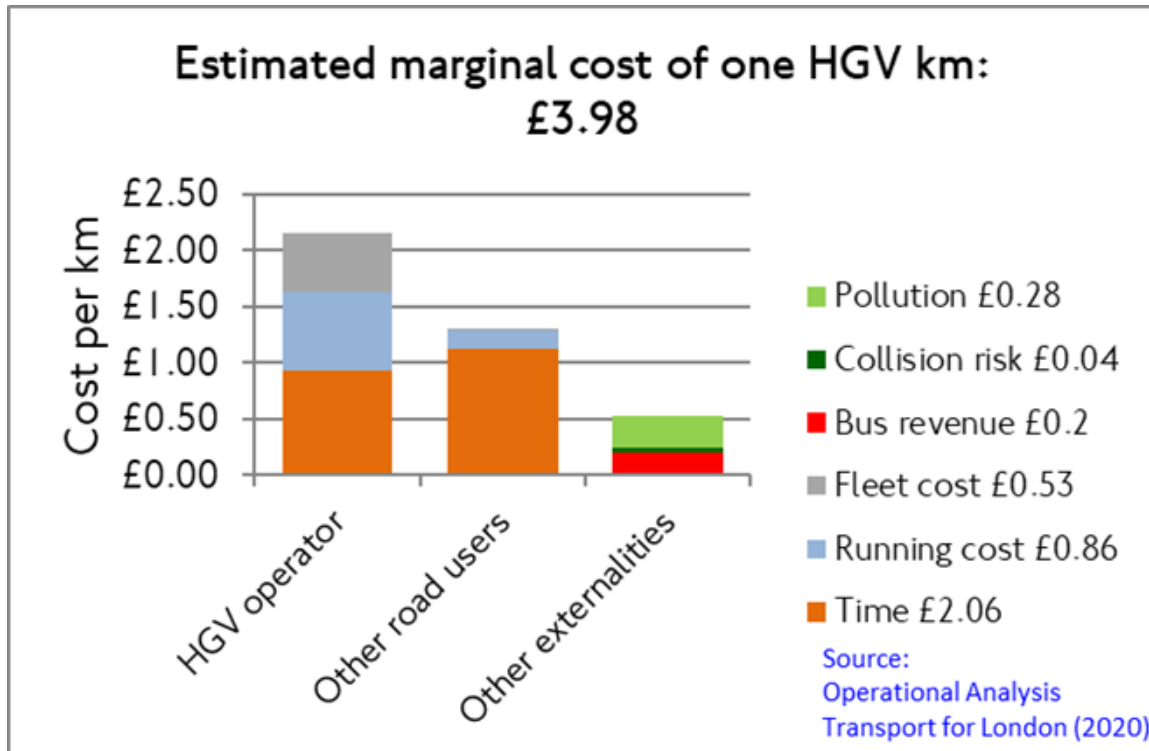
Approx. 20km one-way distance from site location.	
Savings - Calculation Outputs	
• 1 633 trips	(14,700/18t) x 2(incl. return trip)
• 32,666km	(1633 x 20km)
• 86.9 tonnes/CO ₂	(32,666 x 2.66*)

Network saving costs: £129,375

Transport for London benefits

Reduction of HGVs on the road network:

- Reduction in network congestion
- Reduction of potential HGV/cycling/pedestrian conflict
- Reduction of public transport (bus) delays thus aiding journey time reliability
- Reduction in cumulative HGV noise and dust on the road network
- Reduction of NOx, CO2 and Particulate Matter (PM10) levels
- Reduction in highway maintenance costs from carriageway wear and damage



185 Park Street:

The results of 185 Park Street local crushing and recycling case study demonstrate that this can substantially reduce construction HGV trips: 62% (4,670 cubic metres) of the 7565 cubic metres of demolition material was locally crushed and recycled on site for use as piling mats and for other purposes. This is equivalent to 549 fewer HGV trips or approximately 9880km fewer HGV kms travelled.

Network saving costs: £39,281

Holding Areas:**Shard Place:**

Situation faced:

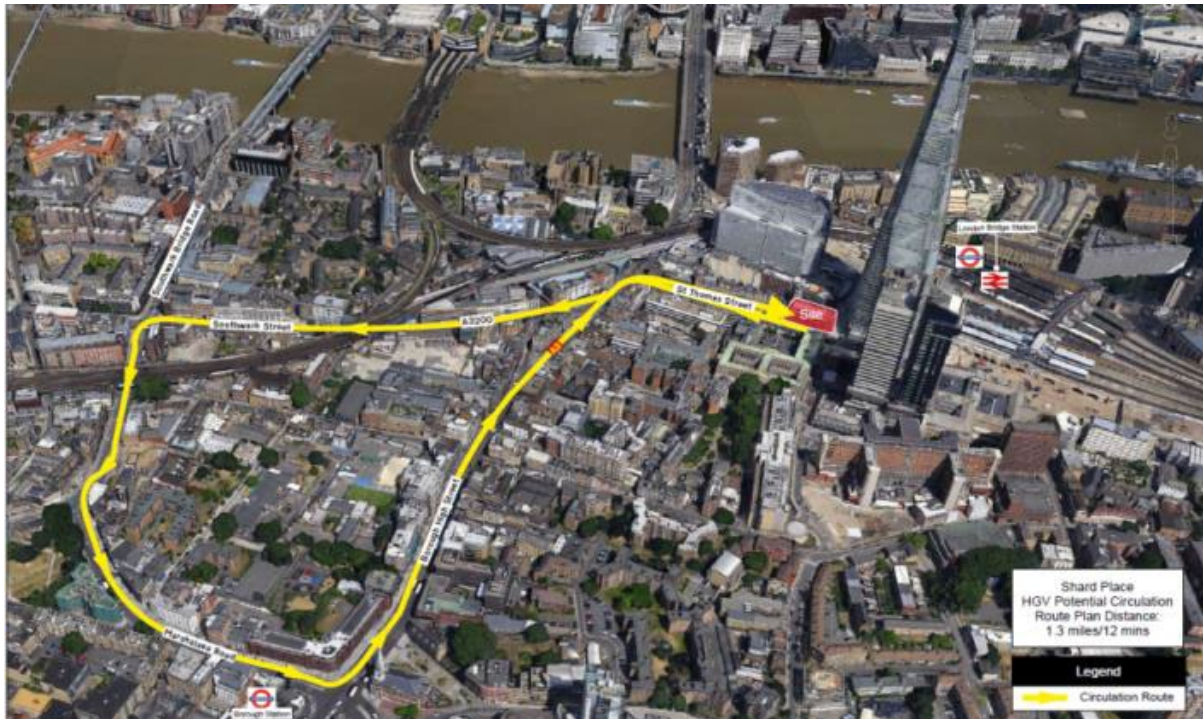
Timings of deliveries are key to construction, if not conducted correctly vehicles often queue outside work sites, or are sent on repeated loops causing congestion, delay, fuel waste, increased emissions, driver stress and safety issues. Surveys have shown, some sites experience looping between 10 and 20 times per day. Holding vehicles on route to site can reduce these impacts but sourcing such facilities can be challenging.

Actions taken and timescales:

- Assessing TfL's existing parking facilities (survey usage) and road capacity (available width) can identify potential locations to implement holding areas.
- Road network investigation and surveys can take between 3 and 4 weeks
- A facility assessment (including a safety audit) can take up to 30 days to approve.
- Traffic Regulation Order (TRO) to suspend red route controls - 8 weeks approx.

Task undertaken:

In order to implement a facility, TfL liaise with developers and any impacted stakeholders to address construction outputs and implications to the road user. This includes a Memorandum of Understanding (MoU) for how the facilities are to be managed e.g. smooth and regimented operations, no noise, no loitering and no idling.



Savings based on:

10 vehicles per day experiencing holding loops using a 2km loop
2 year programme (50 weeks per year)

10,000km

4140 trips

26,800kg CO₂ (Exeter AC CO₂ Calculator)

£3167 in fuel and maintenance

Network saving costs: £39,758

Sharing holding areas

Utilising Great Dover Street

In challenging times requires flexible and resilient approaches. To help support local economies there may be possibilities to lease/rent land to use as holding areas

Situation faced

Several sites near Southwark Bridge were experiencing inefficiencies outside their sites including sitting idling, obstructing traffic and/or being sent on holding loops.

Actions taken and timescales

All sites were approached to discuss the issues and to investigate all avenues and opportunities to mitigate the problem. The focus was on utilising any spare capacity a nearby holding area could offer.

- Sharing HGV flow data. This supplies detail on whether the holding area is required and highlighted periods of spare capacity for others to utilise.
- How to share between several sites

- Requesting adjacent site details to overlay demands

Task undertaken

- Setting up a multi agreement process using a MoU.
- Agreeing behaviours of contractors using the holding area
- Potential use of welfare facilities (coordinators considerations)
- Following government guidelines on coronavirus



Off-road holding areas

As on road facilities are few and far between it is important to survey alternatives that can supply the same utility. There are multiple car parks, brownfield land and highway land that could be available for discussion.

The 'Braham' development in East London, Transport for London (TfL) and Keltbray recently collaborated to form an off road holding area within a park during concrete pours. By fencing off an area, vehicles were stored off the road network and managed in a regimented fashion. This helped improve the efficiency of operations during the pours and with no vehicles being observed blocking the highway.



TfL, Tideway and developer Black Pearl arranged a method to lease brownfield land in advance of construction to enable Tideway construction traffic to be held and regulated.



Using traffic signals to aid access/egress

JRL Group: Old Street Art'otel

Transport for London (TfL), London Borough of Hackney and JRL collaborated to reduce the negative impacts caused by challenging road layouts and the associated lengthy diversions for HGVs.

Construction traffic at the Art'otel Development on Old Street have a HGV management method of left in and left out of site. Vehicles are then diverted onto a longer diversion of 3.7 miles due to Old Street no longer having a roundabout as well as additional banned turns in the area. To reduce the impacts, HGVs would be

required to turn right out of site. However, the egress point is adjacent to a main set of traffic signals and there are four lanes to negotiate (two being bus lanes), which raises safety concerns (see map).

TfL investigated traffic signal cycle times and method of control, traffic flows and all potential traffic conflicts. We found there was a 58 second window of opportunity to turn a vehicle, which reduced conflicts with opposing flows and causes no additional delay.

JRL supplied vehicle swept paths to prove HGVs were capable of undertaking the manoeuvre. A trial was undertaken using a van to observe the marshalling method and to assess any additional risk. The results were deemed acceptable.

To ensure all parties were in agreement of how the method was to be managed, a 'Memorandum of Understanding' was drafted and signed by all key stakeholders. This included:

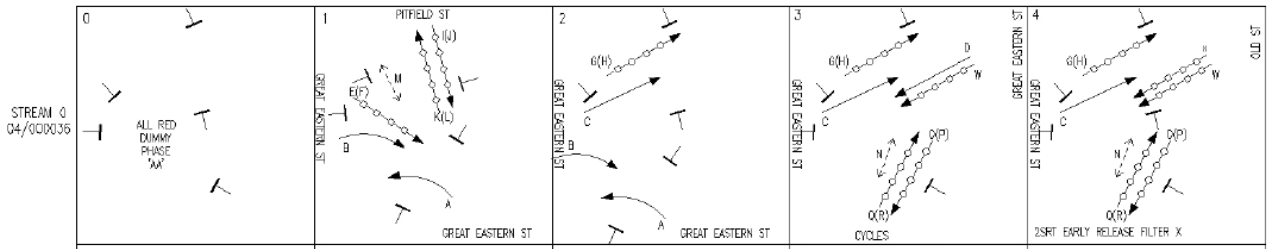
- Traffic marshal methodology
- Swept path analysis
- Use of physical concertina barriers to hold pedestrians
- Traffic signal data
- Agreement for marshals to attend the TfL Elite Marshal training course
- How observations were to be monitored and issues reported

The benefits included an average weekly saving of:

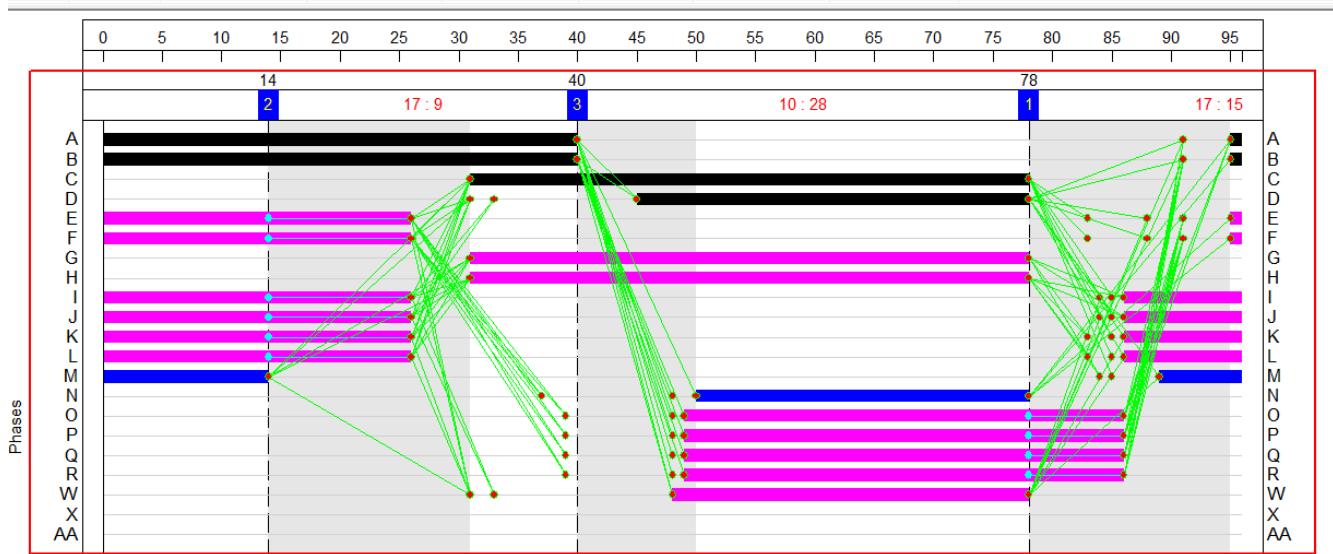
- 31 hours driver time
- 286 miles (avoiding left turn out of site and associated route),
- 281 kg of carbon dioxide,
- 3.9 kg of nitrogen oxide
- 281.1g of particulate matter (2.5 – 10 μ)

Network saving costs (weekly): £1,830

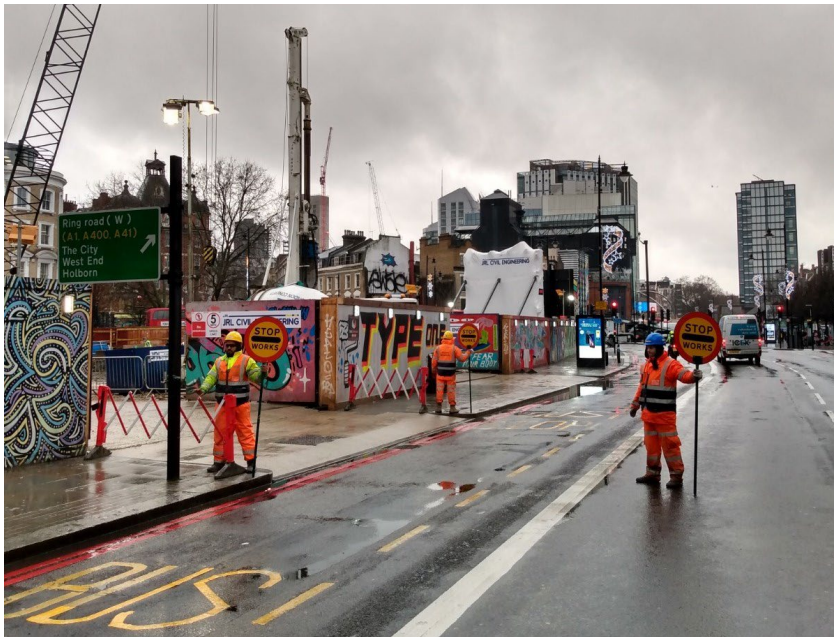
Method of Control at 04/036 - Great Eastern Street – Old Street – Pitfield Street – Tabernacle Street



Signal timings at 04/036 - Great Eastern Street – Old Street – Pitfield Street – Tabernacle Street



Location plan showing traffic marshals and physical barriers when egressing Gate 1



3 Tier Assessment

Transport for London (TfL) have adopted the Healthy Streets Approach to improve air quality, reduce congestion and help make London's diverse communities greener, healthier and more attractive places to live, work and enjoy. The vision for equality and inclusion is that every person matters in keeping London moving, working and growing.

TfL also recognises the role of transport in improving health which is reflected in our strategic goals and business plans. The walking, cycling and using of public transport that Londoners do as part of their everyday routine can deliver economic and social benefits by keeping people active and healthy. It is always therefore a priority to maintain access to sustainable transport.

Roadworks and construction activities often cause barriers to access. It is therefore important we ensure all road users are fully considered during traffic management design which should include project objectives that:

- Maintain and facilitate all-inclusive safe walking and cycling during highway interventions
- Change the way works promoters approach design
- Improve public perception of the highway authority and contractor methodology

To incorporate the above objectives, TfL has been working closely with local community groups and contractors to trial Three Tier Assessments on various highway projects.

The objective of this assessment is to ensure that the needs of cyclists and pedestrians of all abilities are taken into account when temporary road layouts are designed around roadworks or construction. Undertaking such an assessment in three tiers (as described below) is being trialled in a number of locations.

Tier 1: Pre-design

The works promoter, contractor and highway authority should walk and cycle the area before any works take place with local community and cycle groups. This is so that the contractor actively experiences and gets a better understanding of the barriers to access people face daily.

Tier 2: Design

The contractor includes considerations from what has been highlighted during Tier 1 into the traffic management design and assessment process.

Tier 3: During construction

The same groups from Tier 1 return to site during works to walk and cycle the traffic management areas and supply feedback of their experiences. This method can easily be introduced into any mid to long term project.

Examples of Tier 1 of assessments:

Walking group - comments	Site Pictures
<p>Observations, suggestions & feedback</p>	<p>Group picture</p>
<p>We all met at Camberwell Green 26.02.2020</p> <p>Introductions, a safety brief and explanation of the 3-tier assessment process was supplied.</p>	
<p>Observations and suggestions</p>	<p>Peckham Rd</p>
<p>Visually impaired approaching crossing will follow tactile and be unable to find push button.</p> <ul style="list-style-type: none"> • Relocate signal to where it should be (check visibility of aspect) <p>Pedestrian sign may blend in with background and ramp is a little uneven</p> <ul style="list-style-type: none"> • Investigate attaching to green background to improve contrast <p>Stopleveline in place but no signals to advise and may confuse drivers</p> <ul style="list-style-type: none"> • Check sequencing and if required additional heads required. Alternatively, if not needed to remove 	 

Why have two signal heads.
Monica was unable to reach the push button

- Have one signal pole ensuring there are both aspects (traffic and peds) and with a push button
- Remove barriers around the shroud as long as all cables and trip hazards are covered



Signs may blend in with road/footway due to similar colours

- Add some contrast to backs of signs or relocate at high level

Bin caused obstruction for access

- This was removed during walk (thank you)



Busy signage may cause anxiety for some people eg dyspraxia, visual impairments etc..

- Consider relocating businesses open as usual in advance to reduce too much information



Very narrow footway with limited room for buggies, wheelchairs, families etc

- Widen and erect 'narrow lanes, no overtaking cyclists'

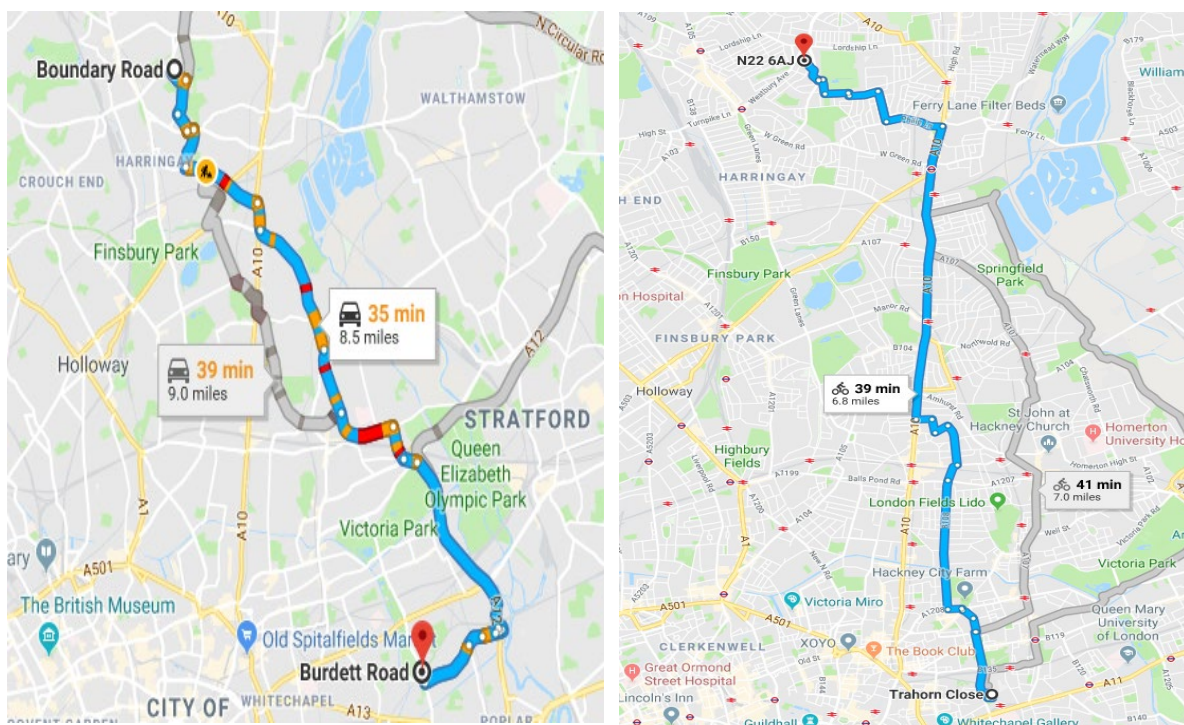
Ramp received good feedback



Cargo Bikes

Cycling is a fundamental element towards attaining a healthier lifestyle and has the bonus of being almost emission free. Many companies within London are now utilising the benefits from cycling within their business and some are having their goods delivered by cargo bike. This opens up a big opportunity for the construction industry to get involved.

McCoy Engineering is a small design and build engineering company based in North London. They required delivery of their innovative work benches to the Cross Rail site in Whitechapel. The units weighed a total of 130kgs and were approx. 2m in length. Due to size, the benches were secured on a trailer.



All freight being delivered by commercial vehicle is required to go to the holding area for a FORS compliance check. This could take up to 30 minutes extra and involves additional mileage.

Outcomes and benefits - Based on delivery and return trip

Total time and distance by van	= 105 mins	34km
Total time and distance by bike	= 78 mins	21km
CO2 savings	= 10 kg CO ₂ /km	
Cargo bike rider benefits	= 310 kcal burned	

JG McCoy deliver their products by bike wherever practicable.

Speedy Hire

Established in 1977, Speedy are one of the UK's leading tools and equipment hire company. In addition they provide training, testing inspection and certification services, as well as consumable and equipment sales. They operate in the UK construction, infrastructure, industrial, utilities, events and facilities management markets and have operations in the Middle East and Kazakhstan. Speedy has more than 200 locations nationwide, one of the largest national networks in the sector.



During mid-2018, Speedy Hire took part in a 'Constructors Cycle Experience' <https://ccsbestpractice.org.uk/entries/a-constructors-cycle-experience/> which involves been taken by TfL on a tour of London's cycle and road network using Santander Hire cycles. Pedal Me, a cargo bike company kindly joined the ride to enable an introduction of cargo bikes to the Speedy team.

Understanding the dynamics of cargo bikes was necessary to truly understand how they can be adopted into the industry. We discussed how tools and equipment could be loaded onto and delivered by a bicycle, size and weight of loads and how the rider was impacted during cycling e.g. braking, balance etc.



An initial trial took place over a one-month period, ensuring that hire items were delivered safely, quickly and emission. 83 deliveries were undertaken during the trial.

To date, Speedy have been involved with over 100 deliveries across London by cargo bike which includes deliveries to some high-profile projects including; HS2, Crossrail and Thames Tideway.



15kg

OF CARBON SAVED PER DELIVERY

*Miles per litre 5.29 (based on our usual delivery van)
x 2.68kg per litre burnt.*

*Average journey in London is 8 miles.
We used the bike on a 2 mile radius.*

Recommendations:

The benefits from adopting practices as detailed in the above case studies are quite clear. Such innovative techniques help ensure that construction within London is done so in a safe and efficient manner. It is imperative that the uptake of measures in construction projects is encouraged and potentially made to be compulsory. TfL should be the benchmark for this, and it should be a requirement for any TfL-led schemes and projects. Liaison between key stakeholders at early stage in the lifecycle should include discussions around the adoption of best-practice methods.

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