CASE STUDY: Transport for London (TfL) and Croydon Council (LBC) – 'Reducing air pollution through a development partnership'

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Introduction

London is in breach of European legal limits for Nitrogen Dioxide (NO_2), and many areas exceed the safe limits for Particulate Matter (PM) set by the World Health Organisation (WHO). Pollution is a contributing factor in shortening the life expectancy of Londoners and disproportionately impacts the most vulnerable. Approximately 9,500 deaths occur each year due to the illnesses caused by long-term exposure to air pollution.

The Mayor of London, Sadiq Khan, has committed to urgent action to clean up the Capital's air and has set up measures to tackle the emissions from road transport, especially from diesel engines (GLA, 2016).

Transport for London (TfL) is the integrated transport authority for London. Its purpose is to keep London moving, working and growing and make life in London better. TfL reinvests its income to run and improve London's transport services. On the roads, TfL regulates taxis and the private hire trade, runs the Congestion Charging scheme, manages the city's 580km 'red route' network, operates all of the Capital's 6,200 traffic signals and works to ensure a safe environment for all road users.

To tackle air quality, the Mayor and TfL is introducing an Ultra Low Emission Zone in 2019 (replacing the T-Charge) and will charge any vehicles that exceed its limits to enter. This measure is estimated to halve the number of people living in areas exceeding the EU legal limit value for NO_2. Other measures to clean up the road-bound public transport system include retiring the oldest buses and taxis and replacing them with less-polluting types.

There are other ways in which emissions can be reduced. This paper discusses a partnership between TfL and Croydon Council to minimise the environmental impacts arising from the construction of major development around Croydon town centre.

About Croydon Council (LBC)

Croydon's population is now estimated to be 381,000 - the second most populated borough in London. Croydon's Opportunity Area Planning Framework (OAPF) sets out a 20-year vision for the area, and has been adopted by the council as a supplementary planning document (GLA, 2017).

The document prepares the grounds for more detailed masterplans of individual areas, and identifies the need for approx. 10,000 homes to accommodate 17,000 anticipated new residents and 100,000 sqm of new commercial space in the town center.

Croydon's Community Strategy 2016-2021 includes:

- To secure a safer, cleaner and greener borough.
- To secure a good start in life for residents and children in the borough.
- To make Croydon a great place to work, learn and live.
- To improve the environmental wellbeing of our residents and communities
- To promote environmental sustainability.
- To protect children and vulnerable people from harmful effects of air pollution
- To contribute to increasing healthy life expectancy and reducing early death from cardio-respiratory diseases.


Lansdowne Road Development (68 & 41 Storeys)

In early 2014 LBC, the Greater London Authority (GLA) and TfL agreed to jointly commission a Development Infrastructure Funding (DIF) Study for the Croydon Opportunity Area (COA) to help facilitate more homes and jobs and understand infrastructure needs. This study identified a series of infrastructure

projects in the COA. This led to the development of the Growth Zone model as a means of meeting this funding challenge

From inception, the Growth Zone was developed as a collaborative approach with the GLA and TfL to secure Central Government investment in the form of fiscal devolution and/or grant funding in Croydon. It has developed into a business rate retention scheme based on a Tax Increment Financing (TIF) model over a designated area in central Croydon. In essence, it proposes to borrow to fund infrastructure projects which are essential to growth, with the costs of borrowing repaid by future uplift in the business rates base.

The Growth Zone will run until approximately 2034 and it will fund a number of phases of infrastructure delivery, although the focus is on the first five years in order to coincide with major development activity in the pipeline. Currently 46 projects have been identified to support and enable the development activity including funding to mitigate the impacts of construction related activity.

Westfield Shopping Centre proposals

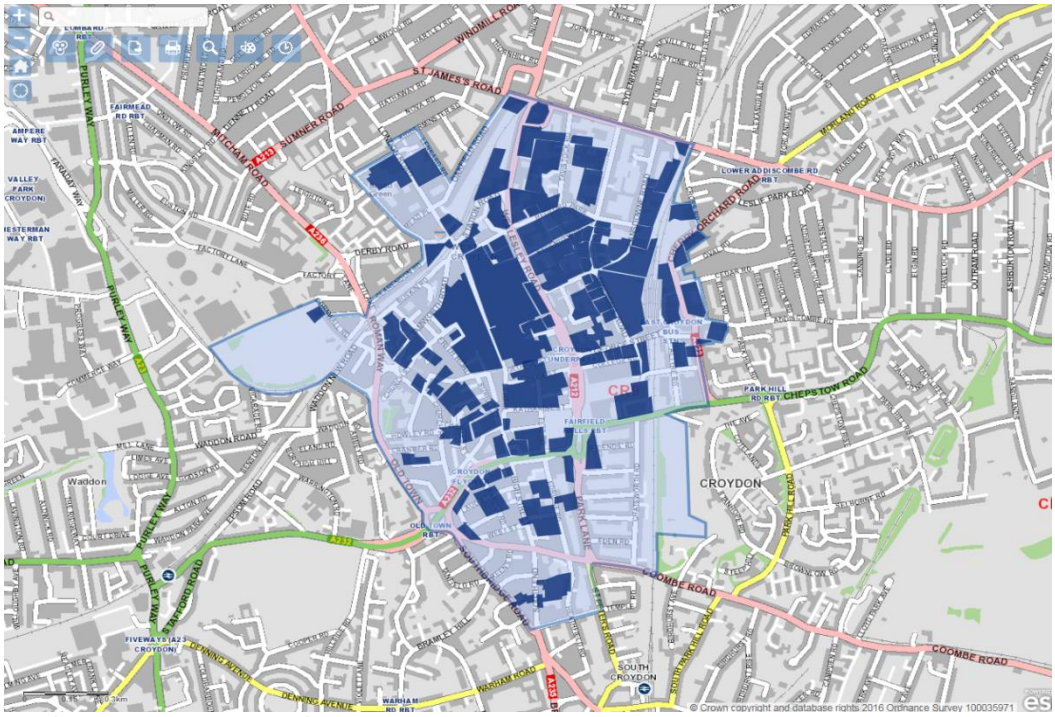
The jobs and housing outcomes are just one element of a wider development programme which aims to recreate Croydon as a truly modern, sustainable metropolitan town centre.

The Growth Zone will also provide clear additionality in terms of the early and accelerated delivery of homes and jobs that would not occur without this initiative. It provides certainty to developers, investors and residents regarding the delivery of major infrastructure projects which is likely to accelerate discretionary development. In turn, these benefits positively affect the whole of Croydon given the jobs and opportunities that are created.

The TfL and LBC partnership

TfL and LBC are working together to mitigate the potential environmental impacts on the local community arising from the extensive planned development around Croydon town centre, while still maintaining the desired delivery programme.

Applying learning lessons from other development clusters in London, TfL and LBC have set up a Construction Logistics Forum (CLF) to bring stakeholders together to better understand the impacts expected during the next 5 to 10 years. All those planning to undertake works themselves, plus those impacted by the works, are invited - including developers, project teams, contractors, environmental teams, utility companies, bus and tram operators, cycling and walking user groups, and traffic signal engineers.



Croydon Town Centre Regeneration Area

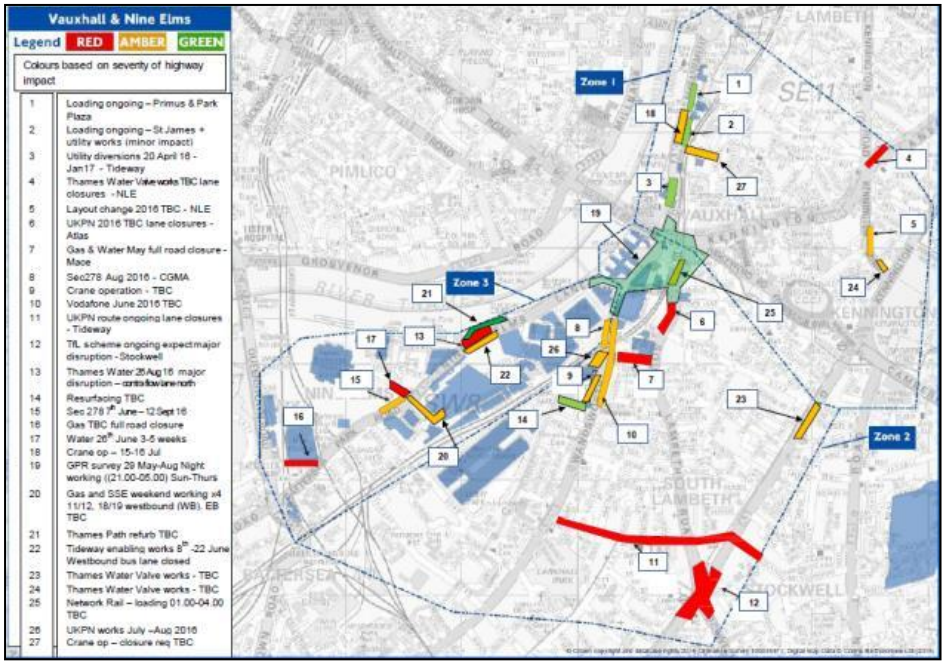
The aims of the CLF are to provide overall visibility of planned works, to assess and discuss the impact of individual or cumulative sets of works and, critically, to seek to integrate construction-related matters such as freight traffic in a pragmatic fashion early on in the planning stages so that construction related emissions are minimised.

The CLF has focused on creating a package of strategies to mitigate the impacts. These are described in further detail throughout the rest of this paper.

- Consolidated works programmes
- Utility master planning
- Future proofing
- Freight activities
- Recycling demolition arising
- Management of non-road mobile machinery (NRMM)

Consolidated works programmes

Mapping all planned works (including highway schemes, utility connections/diversions and Section 278 civil works) in one place shows visually when and where works may take place and enables early stage master planning. The example below was produced for the Vauxhall and Nine Elms development area, and a similar exercise is being carried out for Croydon.



Vauxhall and Nine Elms Working Group works programme

This then helps the CLF identify opportunities for collaborative working methods, for example allowing multiple sets of roadworks to be coordinated under one shared road closure rather than under a number of separate ones (which would be more disruptive and costly).

As part of a previous development at Waterloo, TfL worked closely with a contractor to implement a multi-utility trench and changes to the road layout during the works that maintained two-way traffic (instead of the one-way working that had been proposed). This method saved 270 days of roadworks.

Utility master planning

It is important to work closely with utility providers when planning developments. A utility workshop has been held for Croydon that brought all four providers together (Gas, Water, Electric and Communications) to discuss future plans in an open and transparent manner.

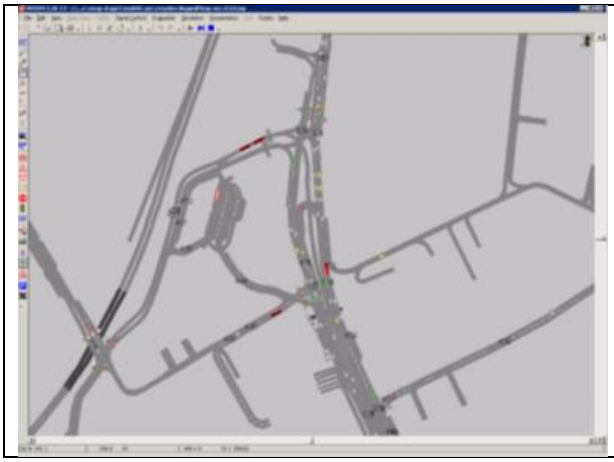

Potential utilisation of pedestrian subways

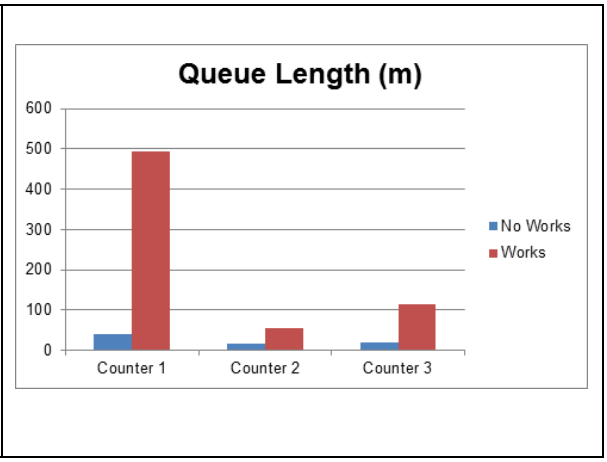

Map of abandoned gas infrastructure (Croydon)

This also identified other opportunities such as the potential for utilising pedestrian subways and abandoned gas and water mains as conduits for future utility supplies – as pictured above. Such approaches ultimately mean less roadworks being required to install new infrastructure.

TfL has undertaken some VISSIM (micro simulation) modelling to test the possible results of using abandoned infrastructure on road network congestion caused during roadworks. The model compares a 'do something' scenario (i.e. utilise abandoned utilities) with 'do nothing' (i.e. excavate and lay new infrastructure) on a section of the Croydon road network.

The chart below (right) indicates a potentially considerable reduction in traffic queue lengths during roadworks if abandoned utilities are used. TfL and LBC will continue to push for this approach to be adopted wherever practicable in the Croydon development.





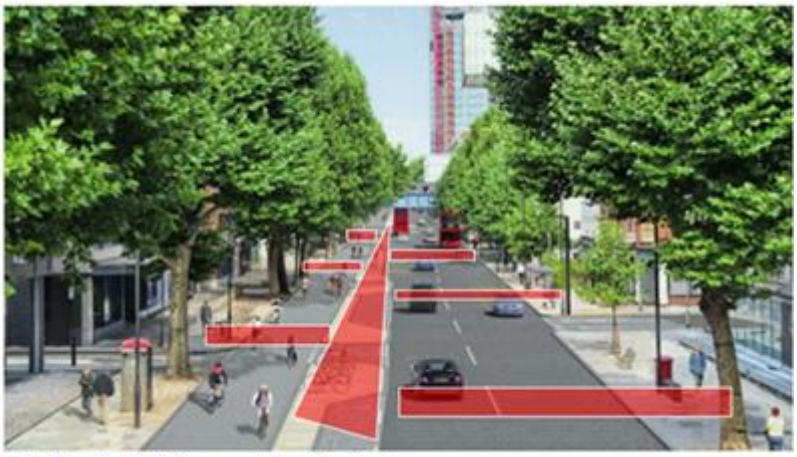
Future proofing

In 2012, through its Lane Rental Scheme, TfL started charging roadworks promoters in London for occupying the busiest roads at the busiest times. This charge incentivises behaviour change towards completing roadworks in the most expedient way, and minimises highway occupation where it is most disruptive.

The surplus funds that TfL receives from Lane Rental can be used to fund activities intended to reduce disruption and the other adverse effects of roadworks. Lane Rental funding has been used on the following strategies that form the 'future proofing' ideology:

- Identifying and mapping areas for future regeneration and Highway Authority projects
- Identifying the risk from potential utility routings (power and communications) on network capacity, congestion, safety and other associated impacts e.g. emissions

- Working with project teams and statutory undertakers to assess the risk to projects from such development requirements
- Investigating funding opportunities to incentivise project promoters to protect schemes post build - e.g. Cycle Superhighway 6 (CS6) on Blackfriars Road integrated empty utility ducts during its build to cater for future development needs (see below)



Blackfriars Road (CS6) spare utility infrastructure

TfL is working with LBC via the Growth Zone to see how future proofing techniques can assist with protecting Croydon's schemes in the future.

Freight activities

Working closely with developers has identified a number of construction practices that adversely impact road users and contribute to congestion, including vehicles idling and being sent on repeated holding loops. TfL has developed the following innovative methods to address these issues and reduce the associated impacts from construction traffic:

***Regimented marshalling*:** Incorrect marshalling causes delays, increased emissions and safety issues. Regimented methods can help reduce vehicle manoeuvering time and allow restricted manoevres to take place e.g. right turns into or out of site.

TfL has introduced a memorandum of understanding (MoU) on strict marshalling methods which can include bespoke measures that remove specific situations e.g. cycle and pedestrian conflicts.

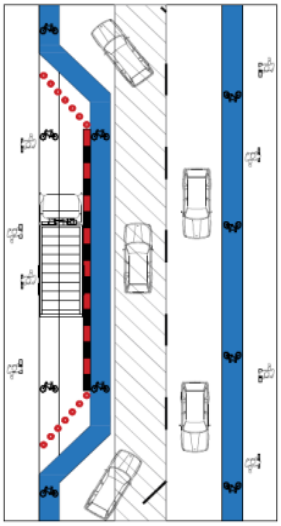
A case study was completed for a site in London Bridge which realised the benefits of forming a neutral zone (using concertina barriers) for HGV access/egress reducing vehicle maneouvre time by approx. 20 seconds per vehicle saving approx. 700kg/CO_2.

***'Early Doors' agreements*:** Drivers often arrive early to begin loading on time. Issues arise when drivers park on residential roads or obstruct bus lanes, often with engines idling.

TfL's "Early Doors" MoU is a method whereby TfL, local authorities and resident groups agree to allow vehicles on site before set working hours subject to a strict protocol; including engines off, no noise or loitering and strict management by marshals.

Local residents reported observing approx. 4 HGVs per day idling outside a site with engines running for up to 20 minutes. Setting up an agreement to access site early resulted in no reported idling and 9 Tonnes/CO_2 emissions over the remaining programme.

Please see link for more detailed information:
https://ccsbestpractice.org.uk/entries/early-doors-agreement/



***Improved loading*:** Constraints on contractors as to where and when they can load materials can delay projects. Through careful planning, there is often potential to redesign the road network to increase loading times whilst minimising impacts on congestion and vulnerable road users.

Benefits
A site had an off peak (10.00-15.00hrs) loading facility and was experiencing programme slippage of approx. 3 months. By working closely with TfL, a bespoke design was agreed that allowed potential for 24hrs without causing congestion to the road network. This also helped the principal contractor to handover the project on time.

Please see link for more detailed information:
https://ccsbestpractice.org.uk/entries/loading-design-guidance/

***Loop reduction methods*:** If deliveries are not timed correctly, vehicles often queue outside work sites, or are sent on repeated loops causing the associated problems. Surveys have shown, some sites experience looping between 10 and 20 times per day. TfL has been assisting contractors to source strategic holding facilities to mitigate these issues. TfL has also been investigating sharing such facilities during inactivity. This enables adjacent sites to improve their efficiency and reduce the negative impacts.

Benefits
A site in London Bridge worked with TfL to form multiple holding areas. This enabled regimented deliveries without the need to send vehicles on loops saving 4140 trips during the full programme, approx. 10,000 HGV kms and 26,800kg/CO_2 emissions.

Please see link for more detailed information:
https://ccsbestpractice.org.uk/entries/strategic-hgv-holding-areas/

TfL and LBC have brought together all these methods to form one package of measures which is aimed at improving the management of HGVs during Croydon's construction programme. This includes sourcing holding areas in advance to sites being constructed.

Recycling materials

There are opportunities to reuse demolition arising on site (rather than removing) such as crushed concrete (6f2) for piling mats. 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.

TfL worked with a developer on Blackfriars Road to crush and store materials on site to reuse on site for a piling mat. By doing so saved 1600 trips, 31,120km (to and from the contractor's yard) and 83.4 tonnes/CO_2 emissions.

Currently, TfL and LBC are investigating a 6f2 management method that was similar to the method used during construction of the 2012 London Olympic site. This will involve looking at all sites during demolition phases to see what opportunities there are to maintain materials on site or store locally to reduce the numbers and trip lengths of all site associated HGVs.

Management of Non Road Mobile Machinery (NRMM)

Current estimates of NRMM emissions on construction sites indicate that they are responsible for 7% of NOx emissions, 14% for PM2.5 and 8% of PM10 emissions across the Capital.

In 2015, Croydon published a code of practice which provides assistance for developers and their contractors to ensure they reduce their impacts on local communities.

Contractors should comply with the provisions of:

- The Control of Pollution Act 1974 Part IV
- The Clean Air Act 1993
- The Environmental Protection Act 1990

In 2014, the GLA released the Supplementary Planning Guidance document 'The Control of Dust and Emissions from Construction and Demolition'. This document outlines the NRMM standards for new engine emissions in London (chapter 7; Cleaner Construction Machinery for London: A Low Emission Zone for Non-Road Mobile Machinery). Developments are required to comply with the NRMM LEZ policy and maintain an inventory for all NRMM used on site. The inventory must be kept on site and to show regular servicing and the emission limits for all plant.

The Croydon environmental team regularly visit sites to check the documentation is as it should be. All feedback including any compliance issues is fed back through the logistic forum. In addition to the monitioring of sites, TfL and LBC are working with various plant suppliers to see how far technology is advancing with regards to alternative power. These suppliers are often invited to present their new methodologies at the forum.

Poorly trained or unlicensed operators, badly maintained equipment, financial constraints, pressure of tight timescales or a lack of capable manpower can result in insufficient care in managing the construction site environment. This can lead to plant inefficiency and negative outcomes. TfL and Croydon Council have requested that case studies be supplied on alternative methods that can help manage this problem.

One case study included use of a 'simple to use' system that identifies the plant usage and user through a card reader and smart card system. By issuing each potential operator with a personalised smart card that stored data regarding their own licence and experience with equipment it was possible to understand the capabilities of the workforce, highlight training requirements, reduce unnecessary training and ensure that only competent individuals were granted access to machinery. If the user is not allowed to manage certain plant the system can set up and record instances of "denied access."

Summary

The strategies being integrated into the Croydon town centre development area are a small, yet significant part in helping towards a cleaner environment, and the more these practices are adopted elsewhere the more impact they will have in achieving a healthier, greener City.