MAYOR OF LONDON

# The Mayor of London's Nursery Air Quality Audit

## Toolkit of Measures

FEBRUARY 2020

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# 1 INTRODUCTION

This document has been developed to serve as a comprehensive toolkit of measures for addressing air pollution in and around our schools and nurseries.

## 1.1 BACKGROUND

1.1.1. Long-term exposure to poor air quality contributes to thousands of premature deaths in London. There is strong scientific evidence of the acute health effects of short-term exposure to very high pollution levels experienced during air pollution episodes.

1.1.2. Tackling air pollution is one of the Mayor of London's top priorities, and he recognises that co-ordinated action is required to reduce exposure, especially amongst the most vulnerable such as young children, whose lungs are still developing.

1.1.3. The London Environment Strategy, published in May 2018, seeks to reduce the number of Londoners whose lives are blighted by poor air quality. The Mayor wants London to have the best air quality of any major world city by 2050, going beyond the legal requirements to protect human health and minimise inequalities. This include commitments to act to improve air quality in and around schools and nurseries and provide enhanced information to Londoners.

## 1.2 DEVELOPING THE TOOLKIT

### The Mayor's School Air Quality Audit Programme

1.2.1. The first iteration of this toolkit was developed as part of the Mayor of London's School Air Quality Audit Programme, completed in 2018.

1.2.2. As part of this programme, fifty of London's most polluted schools received Air Quality Audits. The audits identified sources of air pollution and potential exposure in and around their schools.

1.2.3. The toolkit of measures was then used to guide the recommendations, which were developed in consultation with the school and borough representatives, to help reduce emissions directly, or to reduce the children's exposure to poor air quality at those sites.

### The Mayor's Nursery Air Quality Audit Programme

1.2.4. In May 2018, the mayor launched a programme of air quality audits in twenty nurseries in some of London's most polluted areas, following the approach developed as part of the Mayor's School Air Quality Audit Programme. The programme also included starter grant funding to support the implementation of the recommendations.

1.2.5. In addition to the previously established audit process, the scope of the nursery audit programme included a greater emphasis on indoor air quality, including establishing a baseline of indoor air quality, and trialling air filtration systems at six of the nurseries, to determine their effectiveness and suitability in a nursery environment.

1.2.6. As part of this programme, the Toolkit of Measures was reviewed and updated, in recognition of the continually evolving nature of the potential measures and their associated evidence, as well as the additional findings from the Air Filtration System trial.

1.2.7. Both programmes were led and funded by the Greater London Authority (GLA), and the development of the audit process, toolkit and the audits were conducted by global engineering consultancy WSP.

## 1.3 THE ROLE OF THE TOOLKIT

1.3.1. This toolkit of measures for addressing air quality issues has been created for use in developing the recommendations for a school or nursery experiencing high levels of air pollution, though it could also be applied to other educational establishments.

1.3.2. The toolkit was compiled from a review of best practice approaches and new technologies. It includes well established measures, as well as more innovative solutions and quick wins. The range of measures includes hard hitting solutions and contains both physical and behavioural measures.

1.3.3. The toolkit is multi-disciplinary and holistic in its nature, as promoted by the Healthy Streets approach, in seeking to address a broad range of factors which each influence how streets are used, how people travel and consequently how clean the air is in and around schools and nurseries.

1.3.4. The toolkit provides information which includes:

- Comprehensive set of measures
- Detailed description of measures
- Identification of their scale of impact and benefits
- Examples of measures, including photos

1.3.5. The toolkit is intended for use as a source of reference in completing school and nursery air quality audits.

1.3.6. To be of greatest value, the toolkit should be a live document, which continues to evolve over time as our understanding about the effectiveness of different measures grows, informed by evidence and research.

## 1.4 WHO IS THE TOOLKIT FOR?

1.4.1. The toolkit can be used by boroughs, schools, nurseries and other organisations who will be involved in completing air quality audits. However, a certain level of technical expertise is required to understand what the measures represent and when it is appropriate to use them. The detailed description of the measures has been written on the basis that suitably experienced professionals will be the main audience. The naming of the measures has been kept as simple and concise as possible so that the terms are, as far as possible, easily understood. However, the use of some technical terms is unavoidable.

1.4.2. Each of the measures are categorised within one of five categories. It is recognised that leadership from a range of stakeholders are required to deliver proposals. The table below summarises the key stakeholders and influencers for each:

**Table 1-1 – Toolkit Measures – Categories and Key Stakeholders**

| Toolkit Measures | | Key Stakeholder | Secondary Stakeholder |
|---|---|---|---|
| **Highways** | The streets and local area immediately around the Nursery. Recommendations would predominantly be delivered by either the borough council or TfL, who manage the strategic roads. | ▪ TfL – Strategic Roads<br>▪ Borough Council - Local Roads | ▪ Nursery |
| **Nursery Grounds** | The playground, frontage and external spaces that form part of the nursery site, where the nursery would typically deliver the types of measures recommended, often supported by the borough council. | ▪ Nursery | ▪ Borough Council |
| **Nursery Building** | The Nursery building, where measures would primarily be delivered by the nursery, supported by the borough council. | ▪ Nursery | ▪ Borough Council |
| **Behavioural Measures** | Behavioural measures refer to initiatives seeking to promote behaviours to either reduce pollution or encourage reduced exposure to emissions, where the nursery would typically deliver the types of measures recommended, often supported by the borough council. | ▪ Nursery | ▪ Borough Council<br>▪ TfL |
| **Wider Measures** | Policy, regulatory or funding related changes, which would need to be delivered by the UK Government, TfL or the GLA. | ▪ Government<br>▪ TfL/ GLA | ▪ Borough Council<br>▪ Nursery |

# 2 APPLYING THE TOOLKIT

## 2.1 WHEN TO USE THE TOOLKIT

2.1.1. The air quality audit approach consists of the following tasks:

- Desktop reviews – including assessment and mapping of air quality around the site, and a review of the local context around the school/ nursery (i.e. busy roads, polluting land uses and other notable sources of emissions).
- Fieldwork – site visits to complete air quality audit templates[1] based on observations, followed by a brainstorming session with the school/ nursery staff and borough officers (including representatives from air quality, school travel, transport planning), to consider potential solutions.
- Issues Identification - review findings and identify key issues, sources of emissions and causes of exposure.
- Identify measures from the toolkit to address these issues, informed by the audit findings.
- Reporting on audit process, issues and recommendations.

2.1.2. Based on the desktop research undertaken before the site visit, site audits and stakeholder feedback, a range of recommended measures and initiatives can be identified to deliver air quality improvements and reduced exposure to air pollution.

2.1.3. This toolkit can be used as a source of reference on the day of the audit, as well as in the subsequent development of recommendations and in the reporting. When undertaking an air quality audit, the toolkit is useful as a checklist of potential measures for reference, when conducting the brainstorming session with the school and nursery staff, to help inform the discussions and generate ideas for consideration by staff and officers.

## 2.2 SUITABILITY OF MEASURES

2.2.1. The characteristics of the local area, school/ nursery site and building must be carefully considered when identifying and tailoring a suitable package of measures to address the issues identified in causing sources of pollution or exposure to air pollution.

2.2.2. These recommendations should also be developed with an appreciation of any relevant existing plans for the local and wider area around the school/ nursery. The auditors and stakeholders should be aware of the

[1] The Mayor's School Air Quality Audit Programme Report – Appendix B – Air Quality Audit Templates
https://www.london.gov.uk/sites/default/files/20180523_saq_master_project_report_inc_append_-_final_v6.0_gla_frmt.pdf

potential wider benefits of each measure and also how well the package of measures works together.

2.2.3. The audit promotes a holistic approach to improving air quality and reducing exposure in the area, such that benefits may also be gained for walking, cycling, public realm and road safety. This is fully accordant with the principles of the healthy streets approach which aims to create more pleasant, safe, attractive, and ultimately more liveable environments.

## 2.3 KEY ASSESSMENT CRITERIA

2.3.1. The measures and initiatives have been categorised as either highways, school/ nursery grounds and building, behaviour change or wider measures, and are assigned an indicative rating against a series of key criteria, including:

**Potential Air Quality Improvement**

- Low – nominal measurable change but a tangible reduction in sources or exposure.
- Medium – a small measurable change in air quality.
- High – a large measurable improvement in air quality.

**Wider Benefits**

- Such as improved safety, visual amenity, child health and welfare, improve learning environments, costs savings, promotion of sustainable transport, contributes to STARS or Healthy Schools London.

**Cost** *(Note these reflect the overall costs, but these may vary amongst difference stakeholders*).

- Low - <£10k
- Medium - £10k-100k
- High - >100k

**Deliverability**

- Quick Win – readily deliverable within 12 months.
- Medium term – deliverable within 1-3 years.
- Longer term – only deliverable in the longer term (i.e. over 3 years).

**Stakeholder Support**

- Low – likely to be significant objections which could delay/prevent the scheme.
- Medium – may be some objections and will require consultation but not significant delays.
- High – likely to be strong support from key stakeholders.

2.3.2. In addition, the toolkit indicates whether the measures:

- Primarily target reducing the source of pollution and/ or reducing exposure.
- May be suitable for introducing as a trial at relatively low cost, within minimal/no consultation for a period of days, weeks or months in order to determine their suitability and impact.
- Are suitable for introduction on a main road and/or minor roads – some measures restrict traffic flow which on main roads may not be suitable, particularly Transport for London roads and the Strategic Road Network.

# 3 QUICK REFERENCE SUMMARY OF MEASURES

**Air quality audit approach:**
A.) Air quality assessments and context plan preparation
B.) Fieldwork – complete audit templates with input from the school/ nursery and borough officers (air quality, school travel, transport planning). Use **Toolkit** as reference.
C.) Review findings and identify key issues, sources of emissions and causes of exposure
D.) Identify measures from the **Toolkit** to address these issues, informed by the audit findings
E.) Identify funding sources and task owners
F.) Establish an approach to monitoring the effectiveness of measures

**1. HIGHWAY MEASURES (Key Stakeholder: Borough/ TfL)**

| **A** | **Anti-idling** | **C** | **Smoothing traffic flow/speed** | **G** | **Parking/loading** |
|---|---|---|---|---|---|
| A1 | Fines | C1 | Modify traffic calming | G1 | Identify a Park & Stride site |
| A2 | Campaigns, including driver engagement | C2 | Optimise traffic signals | G2 | Remove or relocate parking/ loading bays and/or amend restrictions |
| A3 | Information signage | C3 | Junction improvements | G3 | Introduce kerb blip loading restrictions |
| **B** | **Reducing traffic flow** | **D** | **Reducing drop-off activity** | G4 | Enforce parking restrictions |
| B1 | 'School Streets' | D1 | School Keep Clear markings | G5 | Additional parking charges for more polluting vehicles |
| B2 | Collapsible bollards | D2 | Double/single yellow lines | G6 | Introduce or amend CPZ restrictions around school/ nursery |
| B3 | 'Play Streets' *(temporary measure)* | D3 | Improve enforcement of restrictions | G7 | Parking restrictions with ULEV car clubs |
| B4 | Road closure | **E** | **Improved pedestrian and cyclist environment** | G8 | Parking Buddies |
| B5 | Filtered permeability | E1 | Improved pedestrian environment - e.g. footway widening, kerb build-outs | **H** | **Buses** |
| B6 | One-way streets/ No entry restrictions | E2 | Improved crossing facilities on desire lines | H1 | Bus stop relocation |
| B7 | ULEV-only streets | E3 | Traffic calming | H2 | Low emission buses |
| B8 | Width restriction (e.g. 7ft) | E4 | Improve Visibility of the School/ Nursery | **I** | **Freight and Deliveries** |
| B9 | Environmental weight limit signs | E5 | Cycle hangers | I1 | Engage with local businesses to reduce freight/ delivery emissions |
| B10 | Reallocate roadspace | **F** | **Promote a switch to low emission vehicles** | I2 | Promote low emission vehicles for freight and deliveries |
| B11 | Weight restrictions | F1 | Ultra-low Emission Zone (ULEZ) & Low Emission Zone (LEZ) | I3 | Delivery and Servicing Plans (DSPs) for new developments |
| | | F2 | Comprehensive charging provision for ULEVs | I4 | Re-time Borough commercial waste collection |

| | | | | | |
|---|---|---|---|---|---|
| **J** | **Construction** | M8 | Trees, shrubs, planters | **Q** | **Improve school building insulation** |
| J1 | Planning conditions to reduce impacts of freight traffic | M9 | Green spaces | Q1 | Improve school building insulation |
| J2 | Managing the impact of dust and emissions during construction | M10 | Pupil & staff cycle parking | Q2 | Upgrade windows |
| J3 | Retrospective discussions with already permitted developments to lessen the impacts | M11 | Reduce waiting times to enter school grounds | Q3 | Replace temporary classrooms with permanent structures |
| J4 | Non-Road Mobile Machinery Audit | M12 | Relocate playgrounds and free-flow spaces | Q4 | Green Roofs |
| **K** | **Planning Policy and Strategy** | M13 | Co-ordinate start/ finish times with nearby schools | **R** | **Ventilation / Air Filtration** |
| K1 | Healthy Streets approach, sustainable transport and roadspace reallocation from vehicular traffic | M14 | Reconsider playground layouts to reduce exposure | R1 | Installation of Air Conditioning Units |
| **L** | **Green Infrastructure** | M15 | Sheltered waiting areas for parents/ guardians | R2 | Introduce Air Filtration Systems |
| L1 | Green screens | M16 | Cargo bike for deliveries | R3 | Install HEPA Filters in Air Handling Units |
| L2 | Trees, shrubs, planters | **School Building** | | **S** | **Other** |
| L3 | Green Gateways | **N** | **School boilers/ heating** | S1 | Air quality monitoring and information -eco-monitors/ walking route maps. |
| L4 | Pocket parks | N1 | Upgrade aging boilers | S2 | Fit Butchers Curtains to Doorways |
| **2. SCHOOL SITE MEASURES (Key Stakeholder: School/ Borough)** | | N2 | Install Optimising Compensator Control System for School Boilers | S3 | Add indoor plants |
| **M** | **School Grounds** | N3 | Boiler flues and extraction equipment | | |
| M1 | Additional scooter/ cycle parking | **O** | **Improve product choice (e.g. cleaning products)** | | |
| M2 | Reduce staff car parking | O1 | Improve product choice (e.g. cleaning products) | | |
| M3 | Anti-idling for deliveries | O2 | Review purchasing choices and switch to low VOC content furnishings | | |
| M4 | Re-timing for deliveries | **P** | **Regular service & maintenance of appliances and equipment** | | |
| M5 | Reduce number of deliveries, staff/visitor vehicle trips and/or use more sustainable modes | P1 | Regular service & maintenance of appliances and equipment | | |
| M6 | Relocate pedestrian entrances | | | | |
| M7 | Green screens | | | | |

| 3. BEHAVIOURAL MEASURES (Key Stakeholder: School/ Borough) | |
|---|---|
| T1 | Attain improved STARS accreditation status, ultimately Gold status. |
| T2 | Promote cleaner walking routes to school |
| T3 | Promoting Park & Stride |
| T4 | Promoting car sharing |
| T5 | Walking Route Maps / Leaflets |
| T6 | Parent and Public Workshops |
| T7 | Prepare 'Welcome Packs' for new pupils / parents |
| T8 | Deliver Air Quality focused lesson/s to children |
| T9 | Awareness raising session amongst staff |
| T10 | Daily monitoring of London Air website/ app |
| T11 | Add Air Quality to Junior Citizenship Scheme |
| T12 | Anti-idling campaign |
| T13 | Attain an improved Award in Healthy Schools London, ultimately a Gold Award |
| T14 | Awareness raising events amongst the wider community |
| T15 | Cycle training and promotional initiatives |
| T16 | Gamification to promote active travel |
| T17 | Restrict or reduce personal deliveries |
| T18 | CPD supporting teacher's subject knowledge on air quality |
| T19 | Walking Buses |
| T20 | Eco-Schools |

| 4. WIDER MEASURES (Key Stakeholder: Borough/ TfL/ GLA/ Central Government) | |
|---|---|
| U1 | Targeted scrappage scheme for polluting vehicles being driven in London |
| U3 | Promote a transition to electric heating and heat pumps |
| U4 | Reform Buildings Regulations to promote heat pumps |
| U5 | Zero emission zones |
| U6 | AFS reference method testing, introduction of common performance standards and design standards. |

## 3.1 HOLISTIC APPROACH

3.1.1. Of the over one-hundred measures included within the toolkit for improving air quality at schools and nurseries, over three-quarters are projected to have relatively small impacts on air quality in isolation, whilst 14% are projected to have a moderate impact, and only 8% were considered likely to deliver a large measurable improvement in air quality in isolation.

3.1.2. Consequently, when developing recommendations, it is essential to assemble a package of measures, which in combination can contribute towards improving air quality, and including with those some moderate and higher impact measures.

## 3.2 HARD HITTING MEASURES

3.2.1. Some of the hard-hitting measures are described below:

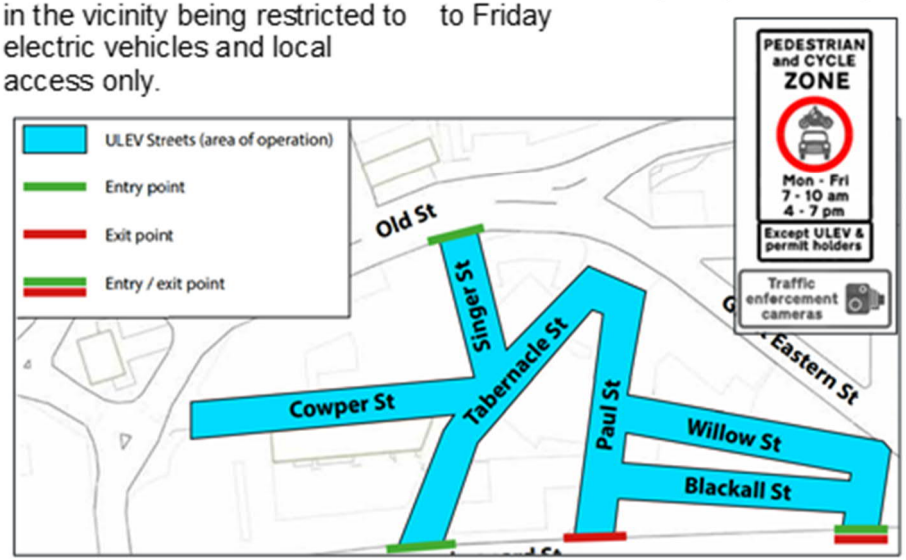
- **School Streets**: traffic access restrictions at school/ nursery opening and closing times to help create a safer, more pleasant environment for children travelling to school, by removing air quality and road safety problems associated with through traffic and drop-off activity on the street/s outside the school. The benefits to be gained will be dependent on how much traffic there is at present.
- **Road closures**: A full road closure where possible would remove the associated vehicle emissions and free up space for alternative uses.
- **Filtered permeability**: The introduction of filtered permeability serves to close a road to motorised vehicles, whilst retaining routes through for pedestrians and cyclists.
- **Ultra-low Emission Zone**: The introduction of the ULEZ in 2019 and further expansion in 2021, and tightened emissions standards for the Low Emission Zone, will significantly improve air quality. The ULEZ expansion and LEZ proposals are subject to consultation.
- **Low emission buses:** Since 2018, all new double deck buses are hybrid or zero emission. The Mayor has also launched an £85m programme so that the entire fleet meets the Euro VI emissions standard in 2020. Around 85 per cent of all TfL buses – including all buses operating in the ULEZ – now meet or exceed the strict ULEZ emission standards. By October 2020 every TfL bus in London – over 9,000 buses - will meet or exceed the ULEZ standards. Twelve new low Emission Bus Zones have been introduced in areas where Londoners are exposed to some of the highest levels of nitrogen dioxide pollution, reducing NOx emissions from buses by an average of 90 per cent along some of the capital's most polluted roads.
- **Wider schemes**: there are a range of potential measures which if introduced can help London take a significant step forward in creating a cleaner city. These include: a targeted scrappage scheme, promoting a transition to electric heating and heat pumps and introducing zero emission zones in central London and town centres and larger inner London and London-wide zones in the longer term.

# 4 CASE STUDIES

| B1 'School Streets' | Description |
|---|---|
| ▪ Potential Air Quality Improvement = Low<br>▪ Cost = Medium<br>▪ Deliverability = Medium-term<br>▪ Stakeholder support = Medium<br>▪ Wider benefits: Road safety<br>▪ Suitable for: Minor roads | Traffic access restrictions at school opening and closing times to help create a safer, more pleasant environment for children travelling to school, by removing air quality and road safety problems associated with through traffic and drop-off activity on the street/s outside the school |
| School Street introduced in Edinburgh - Sciennes Primary School (2015)<br>  <br>LB Hackney is introducing 'school street zones' around 5 primary schools as a 9-month trial. Plan for St John the Baptist School shown below<br> | Purpose<br>▪ Restrict through traffic and drop-off activity in school peak periods<br>▪ Reduces emissions and improves road safety<br>Approach<br>▪ Introduced as part of Pedestrian Zones or Pedestrian & Cycle Zones<br>▪ Use of access signs and ANPR cameras.<br>▪ Exemptions for residents, blue badge holder etc through permits<br>▪ Issue penalty charge notices for contraventions<br>▪ Can use experimental traffic order<br>▪ Need to be aware of knock-on impacts on surrounding streets<br>Examples<br>▪ Schemes in Scotland running for a few years now<br>▪ School streets being introduced in several boroughs, including LB Hackney and LB Croydon |

| B3 'Play Streets' | Description |
|---|---|
| ▪ Potential Air Quality Improvement = Low<br>▪ Cost = Low<br>▪ Deliverability = Short-term<br>▪ Stakeholder support = High<br>▪ Wider benefits: road safety, sustainable travel<br>▪ Suitable for: Minor roads | 'A 'play street' is a timed closure on the street/s outside the school during a certain period of the day (e.g. on Friday after the school day ends). A play street can be run periodically, say once a term. Games and activities are organised for children and parents on the reclaimed street space. Signing and enforcing the closure is a joint exercise between the borough and the school. |
|  <br>Image courtesy of Active Westminster @ActiveWCC<br><br>Westminster Play Streets<br>  | Purpose<br>▪ Restrict through traffic and drop-off activity in school peak periods<br>▪ Reduces emissions and improves road safety<br><br>Approach<br>▪ Organisers may be parents or school staff.<br>▪ Need to gain support from head teacher and residents/businesses before applying to the council for permission.<br>▪ Session typically last between one and three hours. They can take place weekly, monthly, or once a quarter.<br>▪ Councils usually provide the 'Road Closed' signage.<br><br>Examples<br>▪ Schemes started in 2013, now commonplace.<br>▪ Play streets regularly run in several boroughs, including Westminster C, LB Hackney, LB Islington and LB Camden. |

| B5 'Filtered Permeability | Description |
|---|---|
| ▪ Potential Air Quality Improvement = Medium<br>▪ Cost = Medium<br>▪ Deliverability = Medium-term<br>▪ Stakeholder support = Low<br>▪ Wider benefits: road safety, sustainable travel<br>▪ Suitable for: Minor roads | The introduction of filtered permeability serves to close a road to motorised vehicles, whilst retaining routes through for pedestrians and cyclists. The scope to introduce road closures and filtered permeability measures depends on the wider road network, routing options and the impact of displaced traffic, as well as any requirements for preserving emergency access. Where implemented they can be paired with footway extensions, planting and public realm improvements. |
|  <br>Waltham Forest<br>  <br>Haringey<br>  <br>Hackney | Purpose<br>▪ Reduce volume of through traffic travelling through a residential area.<br>▪ Often introduced as part of a range of measures to improve the liveability of a neighbourhood<br>Approach<br>▪ Restrict access at a point or through a section of street.<br>▪ Maintains access for cyclists and pedestrians.<br>▪ Can use bollards, planters or build-out the footway across the road.<br>▪ Needs area-wide approach to consider permeability so traffic not just displaced to nearby roads<br>Examples<br>▪ Waltham Forest Mini-Holland 'villages', 2016<br>▪ Schemes introduced in LB Hackney, LB Haringey<br>▪ Some measures introduced as part of Quietways |

| B7 'ULEV-Only Street' | Description |
|---|---|
| ▪ Potential Air Quality Improvement = Medium<br>▪ Cost = Medium<br>▪ Deliverability = Medium-term<br>▪ Stakeholder support = Low<br>▪ Wider benefits: promoting sustainable travel<br>▪ Suitable for: Minor roads | Ultra-low emission vehicle (ULEV) only restriction, utilising a recently approved exemption for ULEVs paired with access restrictions such as Pedestrian Zone, No Motor Vehicles or Bus Lane to promote ULEV uptake and significantly reduce traffic emissions. Like School Streets, ULEV-only streets can have exemptions for permits holders such as residents, businesses and blue badge holders. |
| Camden – 23 schools will benefit from a 'School Low Emission Neighbourhood' in the Frognal and Fitzjohns area. The proposal will see 8,500 pupils at 23 schools benefit from streets in the vicinity being restricted to electric vehicles and local access only.<br><br>LB Hackney & LB Islington are introducing London's first ULEV-only streets in Shoreditch. One of the streets runs alongside a school. The ULEV-only zones will operate 7am-10am and 4pm-7pm Monday to Friday<br><br>  | Purpose<br>▪ Restrict through traffic and drop-off activity but also promotes use of ULEVs.<br>▪ Reduces emissions and improves road safety.<br>▪ Can introduce in streets with high footfall/cycling where current exposure to emissions is high.<br><br>Approach<br>▪ Restrict access at entry cordon points to the ULEV only streets.<br>▪ Use Pedestrian Zone/ Pedestrian & Cycle Zone or No Motor Vehicle signs, with exemptions for ULEVs and permit holders.<br>▪ Restrictions during certain times/days or 24/7.<br>▪ Use ANPR to enforce restrictions.<br><br>Examples<br>▪ Two areas in Shoreditch: ULEV-only zones in 2018<br>▪ Camden: planning ULEV-only streets at 23 schools |

<table>
<tr><th>G5 Additional parking charges for more polluting vehicles</th><th>Description</th></tr>
<tr><td>

- Potential Air Quality Improvement = Medium
- Cost = Medium
- Deliverability = Medium-term
- Stakeholder support = Low
- Suitable for: Minor and Major roads

</td><td>50% surcharges on top of existing parking charges for more polluting vehicles. A trial in Westminster found that the number of dirtier diesel vehicles using the parking bays dropped by 14%. Several other boroughs have introduced surcharges, including Camden and Islington.</td></tr>
<tr><td rowspan="2">

Photograph: Jinny Goodman/Alamy

Westminster's D-charge raised more than £1 million in its first nine months, to be reinvested as a clean air fund.

Westminster intend to extend its D-charge across the whole borough in phases.

</td><td>

Purpose

- Discourage more polluting vehicles from parking and promote a transition to cleaner vehicles and sustainable transport.
- Raise funds to invest in a range of measures to reduced emissions or exposure, with a particular focus around schools and other sensitive sites.

Approach

- D-charge — a surcharge of £2.45 an hour for non-EuroVI (i.e. pre-2015) diesel vehicles parking in areas of the city - Polluter pays principle.
- Trialled the scheme in resident parking zone F, which largely covers Marylebone and Fitzrovia.
- Funds raised are reinvested as a clean air fund, which aims to cut harmful emissions by bringing in road closures, banning polluting vehicles, replacing old boilers and green infrastructure.

Examples

- Multiple zone across Westminster
- Camden and Islington, with further boroughs also consulting on introducing equivalent charges.
- Bath, Birmingham and Manchester are examining differential pricing, which penalises diesel owners.

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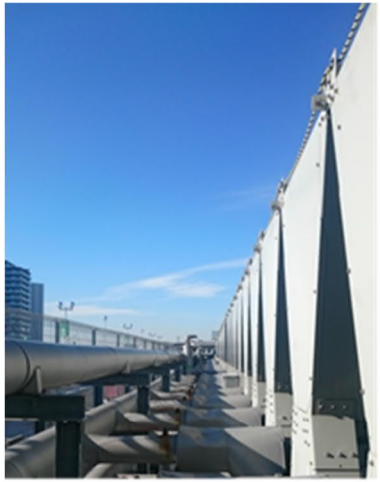
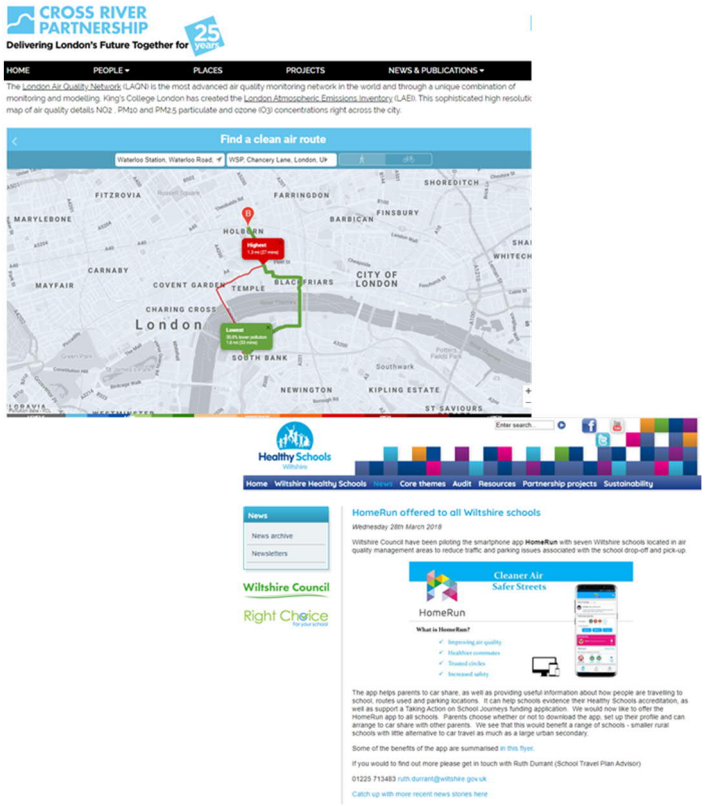
</table>

| L2 Trees, shrubs, planters | Description |
|---|---|
| ▪ Potential Air Quality Improvement = Low<br>▪ Cost = Low<br>▪ Deliverability = Short-Medium term<br>▪ Stakeholder support = Medium<br>▪ Wider benefits: improved visual amenity<br>▪ Suitable for: Major and Minor roads | Installation of trees and planting captures some emissions from traffic, thus reducing exposure to children when approaching the school and when within the school grounds/buildings. |
|  <br>Trees on carriageway outside school. Provides visual road narrowing and encourages considerate driving behaviour<br>  <br>Trees and planting introduced on footway buildout outside school in Waltham Forest. Narrowed road also deters drop-off activity. Planting area provides sustainable drainage. | Purpose<br>▪ Help to block pollutants but also provide shade, improve the look and feel of the area, and create visual cues to drivers that considerate driving behaviour is appropriate around the school environs, also serve as sustainable drainage.<br>Approach<br>▪ Planting and trees on the footway or buildouts immediately outside the school, around the school boundary or on key walking routes to school.<br>▪ If to be introduced on footways then care should be taken that adequate width will remain.<br>▪ Careful planning is required for the introduction of trees to ensure that the right species are used to maximise exposure reduction benefits, retain sightlines, provide shade, minimise maintenance etc. If used in the wrong location then trees can block airflow and therefore trap pollution.<br>Examples<br>▪ Boroughs and TfL have programmes of tree planting.<br>▪ Mayor's Greener City fund provides grants for tree planting. |

| **M7 Green Screens** | **Description** |
|---|---|
| ▪ Potential Air Quality Improvement = Low<br>▪ Cost = Medium<br>▪ Deliverability = Medium-term<br>▪ Stakeholder support = Medium<br>▪ Wider benefits: visual amenity, security/privacy, noise reduction, biodiversity | Exposure to roadside pollutants can be reduced through using green screening. Certain types of plants can trap airborne particles and act as a pollution sink. |
|  | Purpose<br>▪ Traps airborne particles. Green screens provide aesthetic benefits as well as increased privacy, biodiversity and noise reduction.<br>Approach<br>▪ Green screens can be installed or grown along fences, structures and in planters. The screens can be planted directly into the ground or into planters and are maintained with the option of a drip line irrigation system. It should be noted that green screens need ongoing maintenance which has associated time/cost considerations which need to be borne in mind.<br>▪ The most effective types are generally those with a dense vegetation layer and a high leaf density, and/or waxy leaves (such as ivy).<br>▪ Benefits will be heavily dependent on proximity to the pollution source and school, and screen height and orientation to prevailing wind or wind circulation.<br>Examples<br>▪ Precedents: Bowes Primary (Enfield), Oxford Gardens (RBKC) and Sir John Cass (City of London). |

| **N1 Boiler upgrades and heat pumps** | **Description** |
|---|---|
| ▪ Potential Air Quality Improvement = Low<br>▪ Cost = Low-high<br>▪ Deliverability = Short-Medium term<br>▪ Stakeholder support = Medium-High<br>▪ Wider benefits: reduced operating costs | Consider replacing older boilers which are less efficient and contribute to worsening air quality. Where possible replace with Heat Pumps. |
|  <br>  <br>Heat pump condenser units (centralised & standalone)<br>  <br>Aging gas fired boiler | Purpose<br>▪ Reduces or eliminates a source of local emissions. Older boiler emissions rise as combustion efficiency drops.<br>▪ Improved provision of heating (& potentially cooling).<br>Approach<br>▪ Where possible replace with Heat Pumps with zero local emissions, particularly where more significant building changes are planned.<br>▪ Whilst there are significantly higher costs to install and require remedial works, they will reduce ongoing costs and greatly reduce emissions, increasingly so as electricity generation becomes increasingly decarbonised.<br>▪ If direct replacement is required, consider replacing with an Ultra Low NOx gas boiler with dry NOx emissions not exceeding 40 mg/kWh (at 0% O2).<br>Examples<br>▪ Brandlehow Primary School, Putney<br>▪ King Edward VII High School, Kings Lynn |

| R2 Air Filtrations Systems | Description |
|---|---|
| ▪ Potential Air Quality Improvement = Low<br>▪ Cost = Low<br>▪ Deliverability = Short-term<br>▪ Stakeholder support = High<br>▪ Wider benefits: Improved learning environment | The Nursery School AFS trial found that they can be effective at reducing $PM_{2.5}$, and to a lesser extent $NO_2$, in a real-world school/nursery environment, dynamic environments, with opened doors and windows. The trial also found that the AFS units were suitable for installation and operation in a nursery environment, with the experience of the nurseries found to be largely positive, with most remarking that the units were unobtrusive in terms of their presence in the classrooms. In general, the wall-mounted units were felt to be better suited to a nursery environment. |
|  | Purpose<br>▪ Reduces NOx and NO2 levels in classroom.<br>Approach<br>▪ For classrooms with poorest air quality or high exposure, consider installation of these units.<br>▪ As well as upfront costs thee are also ongoing operating and maintenance costs.<br>▪ The trial recommendations promoted an evidence based approach to ensure effective deployment.<br>Examples<br>▪ Air Filtration Systems have been installed at a number of schools across London, including trials at six nurseries as part of the Mayors programme. |

| T2 Promote cleaner walking routes to school | Description |
|---|---|
| ▪ Potential Air Quality Improvement = Low<br>▪ Cost = Low<br>▪ Deliverability = Short-term<br>▪ Stakeholder support = High<br>▪ Wider benefits: Promotion of sustainable transport, Awareness raising, Support STARS and HSL objectives | Encourage children to approach the school using routes that minimise exposure to the most polluted areas, using parallel side streets and off-street green routes where possible. Utilise apps such as the CRP and Kings College London Clean Air Walking Routes journey planner www.walkit.com to produce bespoke walking route plans for pupils. |
|  | Purpose<br>▪ Reduces exposure to pollution by avoiding high traffic routes.<br>Approach<br>▪ The Clean Air Route Finder is a journey planner helps identify low pollution walking and cycling routes in London.<br>▪ The route finder retrieves up to three alternative walking or cycling routes and calculates the total modelled pollutant dose along each route for nitrogen dioxide ($NO_2$) and $PM_{10}$ and $PM_{2.5}$ particulates.<br>▪ King's College London has created the London Atmospheric Emissions Inventory (LAEI). This sophisticated high-resolution map of air quality details NO2, PM10 and PM2.5 particulate and ozone (O3) concentrations right across the city.<br>Examples<br>▪ Cleaner walking route apps and web pages are well established and becomingly increasingly sophisticated. |

# APPENDIX A – DETAILED DESCRIPTION OF MEASURES

| Toolkit Measures | | Description | Purpose | | Potential Air Quality Improvement | Wider Benefits | | | | | | | | | | Cost | Deliverability | Stakeholder Support | Suitable for trial | Suitability | |
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| | | | Reduce Sources | Reduce Exposure | | Road safety | Promotion of sustainable transport | Visual amenity | Security, privacy | Noise reduction | Biodiversity | Improved learning environment | Reduced operating costs | Awareness raising | Support STARS and HSL objectives | | | | | Main roads | Minor Roads |
| **1. HIGHWAY MEASURES (Key Stakeholder: Borough/ TfL)** | | | | | | | | | | | | | | | | | | | | | |
| **A** | **Anti-idling** | | | | | | | | | | | | | | | | | | | | |
| A1 | Fines | Adopt legislation that will allow the borough to fine idling drivers near schools, and ensure the measures are enforced, delivered as part of wider campaign to raise awareness in the first instance, resorting to fines for persistent offenders. | X | | L | | | | | | | | | | X | L | L | H | Y | Y | Y |
| A2 | Campaigns, including driver engagement | Initiate a campaign, such as Westminster's #DontBeIdle campaign, and look to deploying some of the local volunteers to act as 'Vehicle Idling Action Champions' to raise awareness of the impacts idling can have and benefits of turning off your engine. | X | | L | | | | | | | | | | X | L | L | H | Y | Y | Y |
| A3 | Information signage | Signage at the front of the school to raise awareness, accompanied by banner to further promote anti-idling (in a number of languages if required). | X | | L | | | | | | | | | | X | L | L | H | Y | Y | Y |
| **B** | **Reducing traffic flow** | | | | | | | | | | | | | | | | | | | | |
| B1 | 'School Streets' | Traffic access restrictions at school opening and closing times to help create a safer, more pleasant environment for children travelling to school, by removing air quality and road safety problems associated with through traffic and drop-off activity on the street/s outside the school. Signs will inform drivers of the restrictions. Non-registered vehicles entering the street during the times of operation will be identified by camera and issued a fixed penalty notice. Existing residents would be exempt from any penalties. The impacts of displaced traffic need to be carefully considered, and whether it would result in more 'park and stride' journeys to | X | | L | X | | | | | | | | | | M | M | M | Y | | Y |

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| | | school, a switch to public transport, or just displace the activity to a different nearby street. | | | | | | | | | | | | | | | | | | | |
| B2 | Collapsible bollards | As an alternative to the 'School Street' measure, a collapsible bollard or bollards can be used to prevent vehicle access through the street/s outside the school over specified periods. This could be manually operated by a member of staff if granted the necessary permission by the borough, allowing continued access to the school and nearby homes for those who need it. This measure has been successful at a number of schools, including St Joseph's Catholic Primary School in Camden. | X | | L | X | | | | | | | | | | L | M | M | Y | | Y |
| B3 | 'Play Streets' *(temporary measure)* | A 'play street' is effectively a timed closure on the street/s outside the school during a certain period of the day (e.g. on Friday after the school day ends). The play street can be run periodically, say once a term. Games and activities are organised for children and parents on the reclaimed street space. Signing and enforcing the closure is a joint exercise between the Borough and the school. 'Play streets' involve quite a lot of organisation and it is best if a local resident or parent is closely involved in the process who can rally others to the cause. | X | | L | X | X | | | | | | | X | | L | S | H | Y | | Y |
| B4 | Road closure | A full road closure where possible would remove the associated vehicle emissions and free up space for alternative uses. Traffic surveys would need to be undertaken to understand typical traffic flows and potential impacts on surrounding streets. Operational and emergency access requirements would also need to be considered. | X | X | H | | | | | | | | | | | L-M | S-M | L-M | Y | | Y |
| B5 | Filtered permeability | The introduction of filtered permeability served to close a road to motorised vehicles, whilst retaining routes through for pedestrians and cyclists. The scope to introduce road closures and filtered permeability measures depends on the wider road network, routing options and the impact of displaced traffic, as well as any requirements for preserving emergency access. Where implemented they can be paired with footway extensions, planting and public realm improvements. | X | | M | X | X | | | | | | | | | M | M | L | Y | | Y |
| B6 | One-way streets/ No entry restrictions | Investigate options for restricting a road to one-way operation or retain two-way with a No Entry point access restriction. This will reduce traffic flows past the school, which could also enable the footway space to be widened, potentially incorporating trees and shrubs. All of which contribute towards TfL's Healthy Street agenda. Traffic surveys would need to be undertaken to understand typical traffic flows and potential impact on surrounding streets. | X | | M | X | X | | | | | | | | | L-H | S-M | M | Y | | Y |

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| B7 | ULEV-only streets | Introduce an ultra-low emission vehicle (ULEV) only restriction, utilising a recently approved exemption for ULEVs paired with access restrictions such as Pedestrian Zone, No Motor Vehicles or Bus Lane to promote ULEV uptake and significantly reduce traffic emissions. Like School Streets, ULEV-only streets can have exemptions for permits holders such as residents, businesses and blue badge holders. LB Hackney & LB Islington are introducing London's first ULEV-only streets in Shoreditch. One of the streets runs alongside a school. | X | | M | | X | | | | | | | | | | M | M | L | Y | | Y |
| B8 | Width restriction (e.g. 7ft) | The introduction of a width restriction will mean that certain larger (often more polluting) vehicles will have to use alternative routes. The location of the narrowing would need to be considered carefully as it is likely to create some bunching of vehicles which may increase emissions at this point. | X | | L | | | | | | | | | | | | L | S | M | | | Y |
| B9 | Environmental weight limit signs | These weight limits prevent large vehicles from using inappropriate roads, routes and areas in order to: reduce emissions, prevent damage to buildings, preserve the character, amenity and environment of an area. | X | | L | | | | | | | | | | | | L | S | M | | | Y |
| B10 | Reallocate roadspace | Investigate the scope for reallocating some roadspace currently open to all vehicles to promote a wider shift towards more sustainable modes, for example through introducing a new segregated cycle route or bus lane to improve public transport provision and discourage travel by car to reduce local emissions. The likely resulting impact on traffic congestion would need to be considered. | X | | M | | X | | | | | | | | | | H | L | M | | Y | Y |
| B11 | Weight restrictions | Introduce a weight restriction to prevent large freight vehicles routing past a school to reduce local traffic emissions and road safety issues. Alternative more suitable routes would need to be available and the impacts of re-routing would need to be considered carefully. | X | | M | X | | | | | | | | | | | L | M | M | | | Y |
| **C** | **Smoothing traffic flow/speed** | | | | | | | | | | | | | | | | | | | | | |
| C1 | Modify traffic calming | Consider replacing existing traffic calming such as road humps and cushions with more graduated calming measures, such as road narrowing's. The ramps of some humps can be overly steep which leads to excessive breaking and speeding up. A properly constructed sinusoidal road hump will slow traffic but not excessively so, which should minimise vehicle pollution. Sinusoidal humps are much more comfortable for cyclists to negotiate. | X | | L | | | | | | | | | | | | M | S | H | | Y | Y |
| C2 | Optimise traffic signals | Review the scope for introducing a 'green wave', where multiple traffic signals along a route are synchronised to minimise the frequency with which vehicles come to a complete stop, and enable a smoothest possible flow of traffic. The University of Leicester has found that a 10% reduction in emissions may be achievable in some cases. | X | | L | | | | | | | | | | | | L-M | S-M | M | Y | Y | Y |

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| C3 | Junction improvements | Investigate options for reducing queuing and delays at junctions near the school to lessen pollution from idling traffic, whilst also improving road safety. However, the benefits of doing so would have to assessed against potentially longer waiting times for pedestrians. Traffic modelling would need to be undertaken to consider wider network impacts, and the risk of potentially inviting more traffic through the junction if the current delays are suppressing demand. | X | | L | | | | | | | | | | | | M - H | M - L | L | | Y | Y |
| **D** | **Reducing drop-off activity** | | | | | | | | | | | | | | | | | | | | | |
| D1 | School Keep Clear markings | Introduce or extend school keep clear markings outside the school gates to ensure safe access for approaching pedestrians, and lessen exposure to emissions amongst concentrated numbers of children. If a school keep clear marking exists then consider introducing another marking on the opposite side of the road. These are uncommon but are allowed under the Traffic Signs Regulations and General Directions. | X | | L | X | | | | | | | | | | | L | S | M - H | | Y | Y |
| D2 | Double/single yellow lines | Introduce parking restrictions to manage and discourage problem parking around the school if roads are currently unrestricted. It should be noted that drivers are allowed to stop on yellow lines for as long as is reasonably necessary for the purpose of picking up or dropping off passengers. | X | | L | X | | | | | | | | | | | L | S | M | | Y | Y |
| D3 | Improve enforcement of restrictions | Increase patrolling and enforcement on school keep clears and double yellow lines. This will reduce vehicle pollution as well and minimise traffic disruption and improve road safety. | X | | L | X | | | | | | | | | | | L | S - M | M | | Y | Y |
| **E** | **Improved pedestrian and cyclist environment** | | | | | | | | | | | | | | | | | | | | | |
| E1 | Improved pedestrian environment - e.g. footway widening, kerb build-outs | Investigate the scope for improving the approach to the school for pedestrians and children scooting and cycling, introducing sections of kerb build-outs, pedestrian refuges, surface treatments, raised tables, narrowing kerb radii and introducing school crossing patrols. All of these measures serve to reduce the dominance of traffic, reduce traffic speed, encourage more sustainable travel and make the routes to school more pleasant, safe and attractive. Footway widening and planting/trees can also minimise exposure to pollution. | X | X | L | X | X | | | | | | | | | | L-M | S - M | H | Y | Y | Y |
| E2 | Improved crossing facilities on desire lines | Investigate scope for improved ('formal') crossing provision so minimise crossing delay and reduce the associated exposure to pollution. Such measures will also improve road safety and can be introduced with traffic management. The crossing facilities can be uncontrolled (e.g. pedestrian refuge) or controlled (e.g. zebra and puffin crossings). | | X | L | X | X | | | | | | | | | | L-M | S - M | H | Y | Y | Y |
| E3 | Traffic calming | Install traffic calming to slow traffic and deter drivers from rat-running. A lower traffic speed will foster a more pedestrian friendly environment. However, it is important to consider the traffic reduction and road safety benefits alongside the potential negative air pollution impacts from increased stop-start traffic movement. Certain types of traffic | X | | L | X | X | | | | | | | | | | L-M | S - M | H | Y | Y | Y |

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| | | calming such as sinusoidal road humps can mitigate excessive breaking/accelerating. | | | | | | | | | | | | | | | | | | | |
| E4 | Improve Visibility of the School | Increase prominence of school to encourage more responsible driving and parking amongst passing traffic. Ways to do this include using different footway or carriageway materials, banners, murals or displays, parking buddies or themed bollards outside the school. | X | | L | X | | | | | | | | | | L | S | H | | Y | Y |
| E5 | Cycle hangers | Where school grounds have limited space, on-street cycle hangers can be used to increase scooter and cycle parking spaces, to encourage sustainable / healthy travel behaviour. | X | | L | | X | | | | | | | | X | L-M | S | M | | Y | Y |
| **F** | **Promote a switch to low emission vehicles** | | | | | | | | | | | | | | | | | | | | |
| F1 | Ultra-low Emission Zone (ULEZ) & Low Emission Zone (LEZ) | Engage with discussions on ULEZ and other consultations on air quality affecting your school neighbourhood. | X | X | H | | X | | | | | | | | | H | M | M | | Y | Y |
| F2 | Comprehensive charging provision for ULEVs | Provide access to a range of electric vehicle charging points to facilitate the uptake of ULEVs amongst existing car owners. Ensure new development near the school encourages sustainable travel by including provisions for electric vehicle, such as bays with charging points. | X | | L | | X | | | | | | | | | M | M | M | Y | Y | Y |
| **G** | **Parking/loading** | | | | | | | | | | | | | | | | | | | | |
| G1 | Identify a Park & Stride site | Seek an agreement with a local business or institution for parents to park at their premises and walk the remainder of the journey, to lessen emissions and vehicle movements around the school. | X | | L | | | | | | | | | | | L | M | M | Y | | |
| G2 | Remove or relocate parking/ loading bays and/or amend restrictions | Remove or relocate bays further away from the school or amend restrictions to reduce emissions from parking movement and drop off activity. If bays are removed/relocated then adequate restrictions should be put in their place. Restriction amendments could include increasing residents-only provision (reduce pay and display) and/or introduce car club or electric vehicle bays. | X | | M | | | | | | | | | | | L | S-M | M | | Y | Y |
| G3 | Introduce kerb blip loading restrictions | Introduce single or double kerb blips to restrict loading close to the school. | X | | L | | | | | | | | | | | L | S | M | | Y | Y |
| G4 | Enforce parking restrictions | Increase patrolling and enforcement of restrictions. If the Borough adopts the necessary legislation it could use mobile CCTV vans to periodically enforce parking on school keep clear markings at drop-off and pick-up time. | X | | L | X | | | | | | | | | | L | S | M | | Y | Y |
| G5 | Additional parking charges for more polluting vehicles | Consider introducing surcharges on top of existing parking charges for more polluting vehicles. A trial in Westminster found that the number of dirtier diesel vehicles using the parking bays dropped by 12%. Several other boroughs have introduced surcharges, including Camden and Islington. | X | | M | | | | | | | | | | | M | M | L | | Y | Y |

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| G6 | Introduce or amend CPZ restrictions around school to restrict non-residents parking | Consult with residents in adjacent residential areas used by parents dropping off / picking up children about the appetite for implementing a controlled parking zone for residents to prevent unsafe parking and idling vehicles, or amending the operational hours of an existing CPZ to include hours of typical drop-off / pick-up activity associated with the school. Any impacts of displaced parking would need to be considered. | X | | M | X | | | | | | | | | | | M | M | L | | Y | Y |
| G7 | Parking restrictions with ULEV car clubs | Consider Introducing parking restrictions to discourage car ownership in the medium to longer term in areas of high accessibility to public transport. This would enable the roadspace to be managed more effectively with a greater emphasis on pedestrians and cyclists, and lessen incidents of congestion as cars. The introduction of car club vehicles, particularly ULEV car club vehicles locally would help expedite this process. | X | | L | | X | | | | | | | | | | M | L | L | | Y | Y |
| G8 | Parking Buddies | Place 'Parking Buddy' figures to discourage unsafe parking from sensitive areas such as School Keep Clears or crossings. | | X | L | X | X | | | | | | | | | | L | S | M | Y | | Y |
| **H** | **Buses** | | | | | | | | | | | | | | | | | | | | | |
| H1 | Bus stop relocation | In some cases, bus stops near the school may serve as a major source of emissions from buses frequently braking and accelerating hard when pulling up to the stop. They may also result in queuing traffic and congestion, and it may be possible to relocate the stop to lessen these issues. Consideration needs to be given to how this affects the catchment, including for pupils and staff, as poorer accessibility may lead to reduced bus use in favour of the car. | X | | M | | | | | X | | | | | | | M | M | L | | Y | |
| H2 | Low emission buses | Since 2018, all new double deck buses are hybrid or zero emission. The Mayor has also launched an £85m programme so that the entire fleet meets the Euro VI emissions standard in 2020. Around 85 per cent of all TfL buses – including all buses operating in the ULEZ – now meet or exceed the strict ULEZ emission standards. By October 2020 every TfL bus in London – over 9,000 buses - will meet or exceed the ULEZ standards. Twelve new low Emission Bus Zones have been introduced in areas where Londoners are exposed to some of the highest levels of nitrogen dioxide pollution, reducing NOx emissions from buses by an average of 90 per cent along some of the capital's most polluted roads. | X | | H | | | | | X | | | | | | | H | M | M | | Y | |
| **I** | **Freight and Deliveries** | | | | | | | | | | | | | | | | | | | | | |
| I1 | Engage with local businesses to reduce freight/ delivery emissions | Engage with local businesses and institutions to promote and explore the potential for consolidation, re-timing, collectivisation and pick-up drop off facilities. The establishment of a Business Improvement District or equivalent would provide a suitable forum. | X | | M | X | | | | | | | | | | | L | M | L | | Y | |

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| I2 | Promote low emission vehicles for freight and deliveries | Engage with local businesses and institutions to promote the use of low emission deliveries, including measures to encourage and support improvements to commercial fleets, the wider use of low emission last mile deliveries, including cycle cargo freight. | X | | M | | X | | | | | | | | | L | M | L | | Y | |
| I3 | Delivery and Servicing Plans (DSPs) for new developments | The borough can investigate opportunities to restrict servicing activity associated with local businesses during key times when children are most exposed to emissions. This can typically be secured via Delivery and Service Plans (DSPs) for new developments, albeit there are often difficulties in introducing such restrictions for existing businesses and ensuring that any such commitments are adhered to unless there are sufficient resources to enforce them. | X | | L | | | | | | | | | | | L | M | L | | Y | Y |
| I4 | Re-time Borough commercial waste collection | Where applicable seek to reschedule the time for commercial waste collection so it does not coincide with the school arrival/departure times, to lessen exposure to their emissions, and the additional congestion amongst general traffic. This would however need to be carefully assessed to ensure that by re-timing their collections they do not simply end up near a different school. The borough can also specify the use of low emission vehicles. | X | | L | | | | | | | | | | | M | M | M | | Y | Y |
| **J** | **Construction** | | | | | | | | | | | | | | | | | | | | | |
| J1 | Planning conditions to reduce impacts of freight traffic | Enshrine within planning permissions a requirement for freight and construction vehicles associated with new developments to be Euro 6 compliant vehicles, and ULEVs as they become available, with consolidation of trips and re-timing of deliveries to off-peak periods as part of planning permissions. Construction Logistics Plan (CLPs) guidance could ensure construction vehicles avoid school start / finishing times. Restrict the number of construction vehicles during key times when children are most exposed to emissions. This approach is applied within a number of boroughs who specifically restrict construction vehicles between 0930 – 1500hrs during term time if there is a school in the vicinity of the site or proposed access and / or egress routes. | X | | M | | X | | | | | | | | | L | M | L | | Y | |
| J2 | Managing the impact of dust and emissions during construction and demolition | Introduce a requirement in planning conditions to manage dust and emissions associated with construction based on the Control of Dust and Emissions during Construction and Demolition SPG prepared by the GLA, which includes requirements for construction sites to monitor air quality and share the results with the borough – https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/control-dust-and | X | X | L | | | | | | | | | | X | L | S | M | | Y | |

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| J3 | Retrospective discussions with already permitted developments to lessen the impacts | Seek to discuss potential options for managing/reducing current/ongoing development construction traffic with key nearby developments to explore what options there may be to: review routings to sites, times of days, opportunities for consolidation, support in promoting lower emission fleet usage. | X | | M | | X | | | | | | | | | L | L | L | | Y | |
| J4 | Non-Road Mobile Machinery Audit | The Council could consider a requirement for a Non-Road Mobile Machinery (NRMM) Audit to be undertaken at construction sites. This requirement is being trialled within some Low Emission Neighbourhoods to help ensure compliance of vehicles used for developments. Currently, NRMM is the third largest contributor of NOx emissions and the fifth largest contributor of PM emissions in London, and any comprehensive plan to reduce London's emissions should attempt to address emissions from construction machinery. | X | | L | | | | | X | | | | | | L | S | M | | | |
| **K** | **Planning Policy and Strategy** | | | | | | | | | | | | | | | | | | | | |
| K1 | Healthy Streets approach, sustainable transport and roadspace reallocation from vehicular traffic | Promote the Mayor of London's Healthy Streets approach which aims to improve air quality, reduce congestion and help make London's diverse neighbourhoods greener, healthier and more attractive places to live, work, play and do business. Take a proactive role in endorsing the approach and supporting these initiatives. | X | X | H | | X | | | | | | | | | H | L | L | | Y | Y |
| **L** | **Green Infrastructure** | | | | | | | | | | | | | | | | | | | | |
| L1 | Green screens | Consider installing sections of green screening/climbers on the security fencing on the front playground fronting onto Meeting House Lane, where there are gaps in the existing foliage. The playground was not in use at the time of the audit, so may not be a priority, and it is partially screened already. A dense vegetation layer with a high leaf density can as much as halve the levels of pollution just behind the barrier, though the benefit tails off with increasing distance. The benefit is mainly attributable to their effect on dispersion, though the deposition of some pollutants onto the leaf surfaces from air that passes through the vegetation will also have a small but beneficial effect. A study by Kings College London assessed the efficacy of green screens in preventing vehicle emissions from nearby roads reaching school grounds, through the installation of an ivy screen. In this instance the screen was found to be an effective pollution barrier, once the ivy had started growing and a significant impact could be seen once the screen had matured. It led to a decrease in the pollution concentrations on the playground side by 23% for NO2 and 38% for PM10. Green screens also provide aesthetic benefits as well as increased privacy, biodiversity and noise reduction. The screens can be planted directly into the ground or into planters and are maintained with the option of a drip line irrigation system. It should be noted however that the same level of reduction would not | | X | L | | | X | X | | X | | | | | M | M | H | | Y | Y |

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| | | necessarily be achieved in each instance, as the local conditions and designs are specific to each site. It should be noted that green screens need ongoing maintenance. | | | | | | | | | | | | | | | | | | | |
| L2 | Trees, shrubs, planters | Install trees and planting to capture some emissions from traffic, thus reducing exposure to children when approaching the school and when within the school grounds/buildings. Trees and planting can be provided outside the school entrances, along the school boundary and on key walking routes to school. If to be introduced on footways then care should be taken that adequate width will remain. It should be noted that careful planning is required for the introduction of trees to ensure that the right species is used to maximise exposure reduction benefits, retain sightlines, provide shade, minimise maintenance etc. If used in the wrong location then trees can block airflow and therefore trap pollution, so due consideration should be given to these aspects. | | X | L | | | X | | | | | | | | | L | S - M | M | | Y | Y |
| L3 | Green Gateways | Introduce planting on the footway and/or buildouts to create 'green gateways' to the school. This will help to intercept some particulates, encourage more considerate driving and create a more pleasant environment which will help to lead to more trips being made by foot or bike. | | X | L | | | X | | | | | | | | | L | S | H | | Y | Y |
| L4 | Pocket parks | Introduction of green infrastructure on reclaimed spaces taken from roads around the school. These would need to be introduced in combination with road closures, filtered permeability or significant road space reallocation. The greening can help to absorb/block pollutants and help to create a more pleasant environment which will encourage more walking and cycling to school. | | X | L | | | | | | | | | | | | M | S - M | H | | Y | Y |
| **2. SCHOOL SITE MEASURES (Key Stakeholder: School/ Borough)** | | | | | | | | | | | | | | | | | | | | | | |
| **M** | **School Grounds** | | | | | | | | | | | | | | | | | | | | | |
| M1 | Additional scooter/ cycle parking | Increase scooter and cycle parking spaces to encourage sustainable / healthy travel behaviour, particularly near the main entrance. Restricted space means opportunities to provide this outside the school grounds should be explored, such as lockable cycle hangers. | X | | L | | X | | | | | | | | | X | L | S | H | | | |
| M2 | Reduce staff car parking | Consider options to reduce the number of staff travelling to / from school by private vehicle, through promoting and prioritising spaces for car sharing and low emission vehicles. This needs to be balanced with potential staff retention / recruitment impacts. | X | | L | | X | | | | | | | | | | L | M | L | | | |
| M3 | Anti-idling for deliveries | Raise awareness with delivery drivers/companies of the detrimental impacts of idling activity. | X | | L | | | | | | | | | | | | L | S | H | | | |
| M4 | Re-timing for deliveries | Re-time deliveries to not coincide with arrival or pick up times. | X | | L | X | | | | | | | | | | | L | S | M | | | |
| M5 | Reduce number of deliveries, staff/visitor vehicle trips and/or use | Reduce number of deliveries through better stock management, encouraging home delivery etc. Use suppliers who promote use of low emission vehicles, possibility through a borough procurement framework. Explore | X | | L | | X | | | | | | | | | | L | M | M | | | |

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| | more sustainable modes | opportunities for school related deliveries to be undertaken via cycle freight. This could be in collaboration with other neighbouring schools | | | | | | | | | | | | | | | | | | | |
| M6 | Relocate pedestrian entrances | Create or re-open a pedestrian entrance away from more polluted areas, especially if children are often likely to congregate outside the school gates for extended periods whilst waiting to enter. | | X | L | | | | | | | | | | | L | S | M | | | |
| M7 | Green screens | Consider installing sections of green screening/climbers on the security fencing on the front playground fronting onto Meeting House Lane, where there are gaps in the existing foliage. The playground was not in use at the time of the audit, so may not be a priority, and it is partially screened already. A dense vegetation layer with a high leaf density can as much as halve the levels of pollution just behind the barrier, though the benefit tails off with increasing distance. The benefit is mainly attributable to their effect on dispersion, though the deposition of some pollutants onto the leaf surfaces from air that passes through the vegetation will also have a small but beneficial effect. A study by Kings College London assessed the efficacy of green screens in preventing vehicle emissions from nearby roads reaching school grounds, through the installation of an ivy screen. In this instance the screen was found to be an effective pollution barrier, once the ivy had started growing and a significant impact could be seen once the screen had matured. It led to a decrease in the pollution concentrations on the playground side by 23% for NO2 and 38% for PM10. Green screens also provide aesthetic benefits as well as increased privacy, biodiversity and noise reduction. The screens can be planted directly into the ground or into planters and are maintained with the option of a drip line irrigation system. It should be noted however that the same level of reduction would not necessarily be achieved in each instance, as the local conditions and designs are specific to each site. It should be noted that green screens need ongoing maintenance. | | X | L | | | X | X | | X | | | | | M | M | H | | | |
| M8 | Trees, shrubs, planters | Install trees and planting to capture some emissions from traffic, thus reducing exposure to children within the school grounds/buildings. Trees and planting can be provided inside the school boundary. | | | | | | | | | | | | | | L-M | M | H | | | |
| M9 | Green spaces | Introduce additional green spaces within the school grounds for use at play time and as part of educational programmes, including initiatives such as edible gardens. | | X | L | | | | | | X | | | X | | L-M | M | H | | | |
| M10 | Pupil & staff cycle parking | Provide additional covered cycle parking spaces to encourage sustainable / healthy travel behaviour | X | | L | | X | | | | | | | | X | L | S | H | | | |
| M11 | Reduce waiting times to enter school grounds | Explore options for being able to let children into the playground or other areas set back/ screened from areas of poor air quality soon upon arrival, rather than waiting outside the gates if this results in exposure to emissions. This will require additional staff time to supervise the playground. | | X | L | | X | | | | | | | | | L | S | H | Y | | |

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| M12 | Relocate playgrounds and free-flow spaces | Relocate playgrounds and free-flow spaces to less polluted areas of the school grounds where practical. Consider the potential for making greater user of areas more sheltered from traffic emissions, or potentially just on alert days where pollution is especially high. Operationally the school would need to be able to manage and supervise the space and movements of children to and from the area for it to be workable. | | X | M | | | | X | X | | | | | | M - H | M | M | | | |
| M13 | Co-ordinate start/ finish times with nearby schools | Engage with nearby schools/nurseries and consider the scope for staggering start/ finish times to lessen congestion and associated emissions. | X | X | L | X | | | | | | | | | | L | S | L | | | |
| M14 | Reconsider playground layouts to reduce exposure | In some cases, it may be appropriate to discourage regular use of more heavily polluted areas of the school grounds, and re-purpose the area for use by facilities such as scooter / cycle parking or storage, which could be re-located to these areas if it will in turn free up less polluted but equally usable play space elsewhere. | | X | L | | | | | | | | | | | L | S | M | | | |
| M15 | Sheltered waiting areas for parents/ guardians | Provide a sheltered area for parents to wait in that is dry to encourage them not to wait in car with the engine running, and to walk, scoot or cycle instead. A simple, low-cost structure would suffice to act as a wet weather shelter for parents and pupils to wait under during drop-off and pick-up periods This structure could also be used for other purposes by the school. | X | X | L | | X | | | | | | | | | L | S | M | | | |
| M16 | Cargo bike for deliveries | Use cargo bikes to make some deliveries instead of using motor vehicles, particularly when operating across multiple sites within close proximity. The Department for Transport is currently operating a scheme to support the purchase of cargo bikes. They will contribute 20% of the purchase price of new e-cargo bikes, up to a maximum of £1,000 per bike. | X | | L | X | | | | X | | | X | | | M | S | M | Y | | |
| **School Building** | | | | | | | | | | | | | | | | | | | | | |
| **N** | **School boilers/ heating** | | | | | | | | | | | | | | | | | | | | |
| N1 | Upgrade aging boilers | Review and consider replacing the older boilers which were considered to be operating to a fair condition, but are likely to be of limited efficiency and contribute to worsening local air quality. Consider replacing with an Ultra Low NOx gas boiler with dry NOx emissions not exceeding 40 mg/kWh (at 0% O2). Where possible replace with Heat Pumps with zero local emissions, particularly where more significant building changes are planned. As whilst there are significantly higher costs to install and require remedial works, they will reduce ongoing costs and greatly reduce emissions, increasingly so as electricity generation becomes increasingly decarbonised. | X | | L | | | | | | | | X | | | L-H | S - M | M - H | | | |
| N2 | Install Optimising Compensator Control System for School Boilers | Installation of an Optimising Compensator Control System to reduce time the boiler is used based on e.g. weather, occupancy of school etc. This should reduce the site gas usage due to more efficient control of the heating system, reducing local emissions from gas combustion. | X | | L | | | | | | | | X | | | L | S | H | | | |

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| N3 | Boiler flues and extraction equipment | Install snorkels for flues that currently emit emissions into school grounds. Relocate/ divert appliance flues/ kitchen flues that are low level, are in areas where children play spend time and are near or below windows that can be opened. Flues and extraction equipment should ideally be exhausting above roof ridge height like the main boiler flues to aid quick dispersal. | | X | L | | | | | | | | | | | L | S | M | | | |
| N4 | Reducing over-heating and tackling heat gain | Install thermostatic radiator valves (TRVs) to enable more efficient heating of school, and lessening incidences of winter overheating that result windows and door being opened and worsening exposure to pollution from the nearby roads. Heat gain as a consequence of classrooms with lots of south facing glass (i.e. solar gain) could be lessened through the introduction of internal blinds or film on the glass. | X | | L | | | | | | | X | X | | | L-M | S | H | | | |
| N5 | Replace aging radiators | Replace aging radiators and pipework where they are inefficient and will have a low heat-transfer. | X | | L | | | | | | | X | X | | | M | S-M | M | | | |
| N6 | Replace boilers with a Heat Pump | In the longer term the gas boiler could potentially be replaced with a heat-pump system. Such a system would run on electricity only, and would therefore not have any combustion on site. Heat pumps deliver a net gain relative to boilers from an energy and environmental perspective, however the typical payback period can be 7/8 years for buildings such as nurseries. | X | X | L | | | | | | | | X | | | M-H | M | M | | | |
| **O** | **Improve product choice (e.g. cleaning products and furnishings)** | | | | | | | | | | | | | | | | | | | | |
| O1 | Improve product choice (e.g. cleaning products) | Paints, cleaning sprays and other synthetic items contribute to high levels of 'volatile organic compounds' which enter the surrounding air and can be harmful to health. Switch to lower VOC alternative cleaning products, such as unperfumed cleaning products. Cleaning practices to reduce VOC - Training of cleaners to reduce detergent use, avoid use of cleaning solvents within classrooms, encourage ventilation of classrooms post cleaning to purge residual VOCs. | X | X | L | | | | | | | | | | | L | S | H | | | |
| O2 | Review purchasing choices and switch to low VOC content furnishings | Ensure that when introducing new furniture, the use of hazardous compounds and residues is limited. Review purchasing choices and switch to low-VOC content furnishings, including pre-owned furniture, and following schemes such as the EU Ecolabel, or a UK specific version if introduced as referenced in DEFRA's Clean Air Strategy 2019. | X | X | L | | | | | | | | | | | L | S | H | | | |
| **P** | **Regular service & maintenance of appliances and equipment** | | | | | | | | | | | | | | | | | | | | |
| P1 | Regular service & maintenance of appliances and equipment | Ensure boilers and other key appliances are well maintained and regularly serviced so they are operating efficiently and as cleanly as possible. | X | | L | | | | | | | | | | | L | S | H | | | |
| **Q** | **Improve school building insulation** | | | | | | | | | | | | | | | | | | | | |
| Q1 | Improve school building insulation | Review building insulation and seek to improve energy efficiency, reduce heat loss, lessen energy usage, and potentially boiler run-times. Potentially less heat gain in hot | X | | L | | | | | X | | X | X | | | L-M | S-M | M-H | | | |

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| | | weather, lessening need for ventilation via opening doors/windows. | | | | | | | | | | | | | | | | | | | |
| Q2 | Upgrade windows | Upgrade windows where possible to double glazed or add secondary glazing, to reduce heat loss, lessen energy usage, and potentially boiler run-times. Potentially less heat gain in hot weather. | | X | L | | | | | X | | X | X | | | L-H | S-M | M-H | | | |
| Q3 | Replace temporary classrooms with permanent structures | Where applicable replace temporary classrooms with permanent structures to high standards of energy efficiency and thermal insulation. | X | | L | | | | | | | X | X | | | H | M-L | M | | | |
| Q4 | Green Roofs | A green roof can contribute towards improving air quality via the filtering mechanism of the plants and substrate. A Sedum Roof can help both with insulation during colder months and a cooling effect during hotter times. It can also benefit biodiversity including insects and birdlife. | | X | L | | | X | | | X | | | | | M | M | M | | | |
| **R** | **Ventilation / Air Filtration** | | | | | | | | | | | | | | | | | | | | |
| R1 | Installation of Air Conditioning Units | Install air conditioning units to prevent overheating and lessening need for ventilation via opening doors/windows, which worsens exposure to air pollution. | | X | L | | | | | | | X | | | | L-H | S-M | M-H | | | |
| R2 | Introduce Air Filtration Systems (AFS) | The Nursery School AFS trial (see full report for further details) found that they can be effective at reducing $PM_{2.5}$, and to a lesser extent $NO_2$, in a real-world school/nursery environment, dynamic environments, with opened doors and windows, though further, more detailed, controlled tests were recommended, recognising the limitations of the trial. The trial also found that the AFS units were suitable for installation and operation in a nursery environment, with the experience of the nurseries found to be largely positive, with most remarking that the units were unobtrusive in terms of their presence in the classrooms. In general, the wall-mounted units were felt to be better suited to a nursery environment. As such, AFS should be duly considered amongst the range of measures available for addressing poor air quality, where the conditions are right (i.e. poor levels of indoor air quality, particularly PM, and where there is limited scope to directly influence the sources of emissions or otherwise reduce exposure). A benefit of AFS over some alternative measures is that they can typically be deployed very quickly, and should have an effect within hours. It will be important for nurseries to consider not only the upfront costs of the AFS units, but also the ongoing operating and maintenance costs. The operation of AFS's will result in carbon emissions associated with their electricity consumption. We would encourage an evidence based approach informed by baseline indoor air quality monitoring, to ensure AFS are deployed effectively. | | X | L | | | | | | | X | | | | L | S | M | | | |

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| R3 | Install HEPA Filters in Air Handling Units | High Efficiency Particulate Filters are filters (in this case fitted to ventilation systems) that will filter air to a high standard. HEPA filters would work with a centralised ventilation system (i.e. air handling unit), but won't have much impact on a school reliant on natural ventilation, such as by opening windows and doors. | | X | L | | | | | | | X | | | | L | S - M | M | | | |
| **S1** | **Other** | | | | | | | | | | | | | | | | | | | | |
| S1 | Air quality monitoring and information provision eco-monitors and walking route maps. | Consider measures to monitor air pollution and ways to communicate this to the school to raise awareness. LB Islington has two TV screens linked to air quality monitors which are installed temporarily in schools to provide real-time information on air quality and to provide information on ways to lower exposure. The air quality information could be communicated to children by a nominated 'ecomonitor'. The monitoring information can be used to let pupils know which are the least polluted routes to get home - via maps which pupils can prepare or using apps such as the City of London's CityAir app. | X | X | L | | | | | | | | | X | | L | S | H | | | |
| S2 | Fit Butchers Curtains to Doorways | Fit Butchers Curtains in external doorways left open for free flow activities to retain heat in the winter, and lessen exposure to air pollution. | | X | L | | | | | | | | X | | | L | S | H | | | |
| S3 | Add indoor plants | Research to date is inconclusive, and further testing is required, with some studies reporting certain house plants can remove $CO_2$, and that the growing substrate, and the microorganisms within, are involved in the removal of pollutants. A limitation is that tests often include a greater number of potted plants than would be feasible indoors to achieve measurable concentration reductions (University of Birmingham and the Royal Horticultural Society). However, researchers at Drexel University published research in the Journal of Exposure Science and Environmental Epidemiology which found that the clean air delivery rate (CADR) at which plants removed volatile organic compounds (VOC) was slower than the standard rate of air exchange in a building. As such, building ventilation systems were found to dilute concentrations of VOC more quickly than plants can extract them from the air. Plants do however also have a number of wider health benefits, including promoting reductions in stress. https://www.cibsejournal.com/technical/plants-as-a-building-service/ provide | | X | L | | | X | | | X | X | | | | L | S | H | | | |
| S4 | Managing art and craft materials | Art and craft materials could be separated from wider classroom activities, undertaken in separate rooms or well-ventilated areas, reducing exposure by the children. | | X | L | | | | | | | | | | | L | S | M | | | |
| **3. BEHAVIOURAL MEASURES (Key Stakeholder: School/ Borough)** | | | | | | | | | | | | | | | | | | | | | |
| T1 | Attain improved STARS accreditation | Strive for an improved STARS status, which would entail delivering a range of measures promoting active travel and reduced emissions. The STARS framework also helps | X | | L | | | | | | | | | X | | L | S - M | H | | | |

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| | status, ultimately Gold status. | document and track progress, and implement recommendations. | | | | | | | | | | | | | | | | | | | |
| T2 | Promote cleaner walking routes to school | Encourage children to approach the school using routes that minimise exposure to the most polluted areas, using parallel side streets and off-street green routes where possible. Utilise apps such as www.walkit.com to produce bespoke walking route plans for pupils. | X | X | L | | X | | | | | | | X | X | L | S | H | | | |
| T3 | Promoting Park & Stride | Promote park & stride amongst the parents and children. A waking bus from the site would entail some additional staff costs. | X | | L | | X | | | | | | | X | X | L | S - M | H | | | |
| T4 | Promoting car sharing | Make use of websites such as Liftshare.com to help find prospective car sharing partners, or the school could act as a forum to manage car sharing amongst the school community. A further option are apps such as HomeRun, a software platform aimed at supporting efficient, active and environmentally friendly school commutes that reduce both congestion and harmful vehicle emissions. The software collects and presents commute data about how students get to school, with key metrics such as carbon emissions, transport modes and distance travelled, calculated and tracked. | X | X | L | | X | | | | | | | | X | L-M | S | H | | | |
| T5 | Walking Route Maps / Leaflets | Pupils are exposed to polluted streets while walking to/from the school. Maps could be created to highlight the least polluted routes. This should be done in conjunction with leaflets raising awareness about the science behind air pollution and its effects, with pupils involved with the design and development of the leaflets, including drawings. | | X | L | | X | | | | | | | X | X | L | S | H | | | |
| T6 | Parent and Public Workshops | Hold parent and public workshops to educate the community on the problems associated with air pollution and the type of measures that can have a positive impact on reducing poor air quality | X | X | L | | | | | | | | | X | X | L | S | H | Y | | |
| T7 | Prepare 'Welcome Packs' for new pupils / parents | Prepare 'Welcome Packs' for new pupils / parents that includes the promotion of apps / sites such as 'www.walkit.com' to a) promote walking to / from school and b) promote the suitable walking routes to avoid air pollution hotspots. | X | X | L | X | X | | | | | | | X | X | L | S | H | Y | | |
| T8 | Deliver Air Quality focused lesson/s to children | Deliver air quality related lesson plan with bespoke materials, and London school curriculum, raising awareness of the issues and the type of measures that can have a positive impact on improving air quality. Lesson plans are available from sources including LSx and as part of National Clean Air day resources. | X | X | L | | | | | | | | | X | X | L | S | H | Y | | |
| T9 | Awareness raising session amongst staff | Awareness raising session amongst staff about managing air quality through classroom ventilation and heating, including practical guidance. | X | X | L | | | | | | | | | X | | L | S | H | | | |
| T10 | Daily monitoring of London Air website/ app | Daily monitoring of London Air website / app to understand air quality on the day and whether e.g. opening of windows, will increase exposure of air pollution to staff and students. | X | X | L | | | | | | | X | | X | | L | S | H | | | |

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| T11 | Add Air Quality to Junior Citizenship Scheme | Junior Citizenship Schemes are run in a number of boroughs for Year 6 students (and occasionally Year 5s). Schemes are run either by the Safety and Citizenship team or by other agencies, such as the Metropolitan Police or local boroughs. Pupils complete a circuit of scenarios in small groups, learning through experience and real-life risk situations that test their ability to make responsible decisions. Different scenarios involved might include: Travelling by bus, Underground, Road safety. Sessions focus on developing respect, responsibility and awareness in young travellers, including: Awareness of possible dangers and personal safety, Journey planning and Active travel choices (such as cycling, walking). An additional module could be added on the topic of air quality, its causes, impacts and measure to reduce sources and exposure. | X | X | L | | | | | | | | | X | | L | S | H | | | |
| T12 | Anti-idling campaign | Awareness raising campaign to reinforce and refresh the effectiveness of existing signage, including a banner, combined with enforcement. Develop an awareness raising banner and leaflets incorporating designs by the children. Also request that bus and coaches turn their engines off when waiting for extended periods, i.e. laying over or waiting to collect children. | X | | L | | | | | | | | | X | X | L | S | H | | | |
| T13 | Attain an improved Award in Healthy Schools London, ultimately a Gold Award | This will entail reviewing the school's practices in promoting health & wellbeing that must be evidenced (via a Review Tool). | X | X | L | | | | | | | | | X | X | L | S - M | H | | | |
| T14 | Awareness raising events amongst the wider community | Raise awareness on the issue of air quality amongst the wider community at a borough or neighbourhood level, through events and programme such as Lambeth Sustainability Week. | X | X | L | | | | | | | | | X | | L | S - M | M | | | |
| T15 | Cycle training and promotional initiatives | Cycle training and other promotional measures can be provided to the school children, but also to staff, as detailed on the STARS website. Additionally, where new cycle routes such as Cycle Superhighways are completed close by to schools, these can serve as an additional focus for promoting greater travel by cycling. | X | | L | X | X | | | | | | | | X | L | S | M | | | |
| T16 | Gamification to promote active travel | Gamification tools can be effective in promoting active travel. 'Beat the Street' is a community-wide programme which aims to improves the health and wellbeing of these areas by getting people of all ages moving. Participants collect a Beat the Street RFID card to tap them against sensors called 'Beat Boxes' located on lamp posts across the area. Players receive points for each box they tap and receive prizes for tapping the most boxes; this motivates entire schools, community groups and businesses into becoming more active. | X | | L | | X | | | | | | | | X | L-M | M | M | | | |

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| T17 | Restrict or reduce personal deliveries | Personal deliveries to workplaces accounts for a significant proportion of total freight traffic in London and their associated emissions. Restricting staff related deliveries to the school and promoting the use of 'Click & Collect' or 'Pick-up, drop-off' (PUDO) centres like Doddle can contribute towards enhancing air quality by reducing vehicle mileage, and removing the emissions from the school. | X | | L | | | | | | | | | | | | L | S | M | | | |
| T18 | CPD supporting teacher's subject knowledge on air quality | Awareness raising session amongst staff about the impacts / costs of heating classrooms and share best practice. The Mayors London Curriculum Programme offers a wide range of high-quality teaching resources supporting most subjects on the national curriculum, CPD for teachers and events for children. A programme of targeted activity for air quality is being assembled to be delivered through the London Curriculum, with a focus on supporting teacher subject knowledge and confidence to tackle air quality as a science subject recognising that this requires a wide knowledge and skill base of science, statistics and mapping. | X | X | L | | | | | | | | | | X | X | L | S - M | M | | | |
| T19 | Walking Buses | A walking school bus is a group of children walking to school with one or more adults, and can be as informal as two families taking turns walking their children to school to as structured as a route with meeting points, a timetable and a regularly rotated schedule of trained volunteers. A bicycle train is a further variant on this, with adults supervising children riding their bikes to school. These can be planned in conjunction with cleaner walking routes to school initiatives to avoid the most polluted streets where possible. This would count as a STARS 'Other Walking Activity' and could contribute to progress. | X | | L | | X | | | | | | | | X | X | L | S | M | Y | | |
| T20 | Eco-Schools | The Eco-Schools Programme is pupil-led, involving hands-on learning that gets the whole school and the wider community involved in environmental projects, including free resources to help them progress to the international Eco-Schools Green Flag. Eco-Schools aims to empower pupils, raises environmental awareness, improves the school environment and also creates financial savings for schools. It engages the wider local community, links to the curriculum and can help deliver Ofsted requirements. | X | X | L | X | X | | | | | X | X | X | | | L | S | M | Y | | |
| **4. WIDER MEASURES (Key Stakeholder: Borough/ TfL/ GLA/ Central Government)** | | | | | | | | | | | | | | | | | | | | | | |
| U1 | Targeted scrappage scheme for polluting vehicles being driven in London | Ensure parents and staff are aware of the low income scrappage scheme being introduced by the Mayor and TfL, so that those that are eligible apply to the scheme. Encourage central Government to at a minimum match-fund the Mayor's scrappage commitments, to help enable even more Londoners to switch from polluting vehicles to ultra-low emission vehicles and more sustainable forms of transport. | X | | H | | | | | | | | | | | | H | L | L | | | |
| U3 | Promote a transition to electric heating and heat pumps | Seek to promote the principles of 'an all-electric city', including reducing/eliminating the use of gas in buildings, which city-wide account for over 33% of emissions, by | X | | H | | | | | | | | | | | | M | L | L | | | |

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| | | requiring or incentivising the use of electric heating/cooling via heat pumps in new buildings and major redevelopments. | | | | | | | | | | | | | | | | | | | | |
| U4 | Reform Buildings Regulations to promote heat pumps | Support and promote dialogue at a national level concerning buildings regulations and how they're calculated to better account for local air quality issues as well as energy efficiency, and so promote wider deployment of technologies such as heat pumps. | X | | M | | | | | | | | | | | | M | L | L | | | |
| U5 | Zero emission zones | Review the effectiveness of planned measures and develop an approach for introducing a zero-emission zone in central London and town centres in the short to medium term, and larger inner London and London-wide zones in the longer term. To be developed in conjunction with other policies such as the creation of Liveable Neighbourhoods, reducing road danger and making more efficient use of the street network, including for freight and servicing. Any specific schemes would be subject to statutory consultation. | X | X | H | | | | | | | | | | | | H | L | L | | | |

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