LLAQM BOROUGH AIR QUALITY ACTION MATRIX

2019

Introduction

Here are 25 actions boroughs are expected to deliver locally as part of their London Local Air Quality Management (LLAQM) action planning obligations.

As part of the London Environment Strategy (LES) process we undertook a rigorous evidence-led assessment of the major pollution sources in London and how to address these in the most effective way possible while ensuring conformity with our legal obligations. A critical area identified by the LES was the role of the boroughs. Consequently, the LES analysis underpins the development of this revised matrix of priority actions.

The actions have been assessed against how easy they are to deliver and their potential air quality benefits, which include both exposure and emissions; correlation with the priorities in the London Environment Strategy, the Mayor's Transport Strategy (MTS) and other national and regional projects; and the boroughs' scope to act. The ease of delivery and potential benefit scores are then multiplied to give a priority rating (the highest being 1 and the lowest 15). However, the ease of delivery and possible benefits will clearly vary hugely from borough to borough and according to the project's scope. We have used all available evidence to assess each initiative's potential impact. All actions chosen for inclusion within the Matrix are important, but we have identified nine key selected measures that boroughs should focus most strongly on. These selected measures are listed below, and beneath them are the foundation measures that boroughs should also include within their Air Quality Action Plans. More detail on these actions is included in the main body of this document:

Priority Rating	Meaning of the priority rating	Actions that fall under this category
Key selected measures	All boroughs should be focusing on these actions as a priority, as they are the most effective to tackle exposure and/or emissions, and require concerted and consistent action across London to secure impact as soon as possible. However, this doesn't preclude boroughs also having additional	• Enforcing the Non-Road Mobile Machinery (NRMM) Low Emission Zone • Promoting and enforcing smoke control zones • Promoting and delivering energy efficiency retrofitting projects in workplaces and homes • Supporting alerts services such as Airtext, and promoting the Mayor's air pollution forecasts • Reducing pollution in and around schools, and extending school audits

	locally-appropriate priorities.	to other schools in polluted areas • Installing Ultra Low Emission Vehicle (ULEV) infrastructure • Improving walking and cycling infrastructure • Regular Car Free days/temporary road closures in high footfall areas • Reducing emissions from council fleets
Foundation measures	Boroughs should be delivering all of these to their best of their ability	• Enhancing monitoring networks and fulfilling other statutory duties • Ensuring construction emissions are minimised • Reducing emissions from Combined Heat and Power (CHP) • Enforcing Air Quality Neutral policies • Increasing the role of the Public Health department in air quality policy decisions • Encouraging schools to join TfL STARS • Low Emission Neighbourhoods (LENs), although they require a high level of funding so may not be appropriate or viable for all boroughs in the short term • Ensuring that Transport and Air Quality policies and projects are integrated • Discouraging unnecessary idling by taxis and other vehicles • Using parking policy to reduce pollution emissions • Ensuring adequate, appropriate, and well-located green space and infrastructure is included in new and existing developments • Ensuring Master planning and redevelopment areas are aligned with Air Quality Positive and Healthy Streets approaches • Engagement with businesses • Update of procurement policies to reduce pollution from logistics and servicing • Reducing emissions from deliveries to local businesses and residents

		• Expanding and improving Green Infrastructure (GI)

More information on the justification for the priority rating of measures is included in the Table of Contents below, from this table you can use the internal links to the main document, which contains more detail on all the actions.

Actions should be included and prioritised accordingly in all new AQAPs. Please note two key points. Firstly, all actions included in this matrix are important and should be delivered as far as possible, the key selected measures are simply those prioritised to help focus and galvanise consistent action across all boroughs. Secondly, the actions are general so can be applied to all boroughs and circumstances. However, they should not be used in AQAPs verbatim without further detail on what is proposed locally. For example, for Action 25, Installation of ULEV Infrastructure, in their AQAPs boroughs should detail exactly what they plan to deliver (x rapid chargers/lamppost chargers, and policies related to provision of on-street residential charging etc.). Please refer to the updated AQAP template for more detail on this.

The matrix is not exhaustive. Boroughs are strongly encouraged to add their own locally-appropriate actions in addition to adapting and enhancing the matrix actions to make it clear what will be done locally.

We will update the matrix every two years, at which time actions may be added, removed or modified.

Key

Ease of delivery	Magnitude of air quality benefits	Priority level *(Priority level score = Ease of delivery × Magnitude of AQ benefits)*
Straightforward = **1 – 2**	High = **1**	High = **1 – 5**
Medium = **3 – 4**	Medium = **2**	Medium = **6 – 10**
Most difficult = **5**	Low = **3**	Low = **11 – 15**

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Theme	Action	Measure (click on the internal links below to find more detail on each measure)	Ease of delivery	Scale of benefits	Priority level	Priority measure selection rationale
Emissions from developments and buildings	**4**	Reducing emissions from CHP	**4**	**1**	**4 High**	Combustion-based CHP can be a significant source of local emissions so tackling this is an important priority, although this is part of day to day planning work, so is not a “selected measure”.
Emissions from developments and buildings	**5**	Enforce Air Quality Neutral policy	**2**	**2**	**4 High**	Although this scores highly and is very important it should be part of the day to day work of the air quality team, so it is not a “selected measure”.
Emissions from developments and buildings	**6**	Ensuring adequate, appropriate, and well-located green space and infrastructure is included in new and existing developments	**2**	**3**	**6 Medium**	Identified as medium due to the moderate impact this will have on emissions.
Emissions from developments and buildings	**7**	Declaring Smoke Control Zones and ensuring they are fully promoted and enforced	**2**	**1**	**2* High and selected**	King’s College estimate that each year wood burning contributes between 23% and 31% of the PM2.5 emitted from within London. Solid fuel burning is a major source of $PM_{2.5}$ that can only be controlled at the borough level Addressing this source is crucial for achieving the LES target to meet WHO guideline levels for PM2.5 by 2030. It is worth noting that borough powers are limited, and the Mayor is lobbying Government for more

Theme	Action	Measure (click on the internal links below to find more detail on each measure)	Ease of delivery	Scale of benefits	Priority level	Priority measure selection rationale
						powers to control this emission source.
Emissions from developments and buildings	**8**	Promoting and delivering energy efficiency and energy supply retrofitting projects in workplaces and homes through EFL retrofit programmes such as RE:FIT, RE:NEW and through borough carbon offset funds.	**3**	**1**	**3*** **High and selected**	Directly reduces emissions and has co-benefits for carbon emissions and reducing fuel costs. Furthermore, there are existing frameworks to support this.
Emissions from developments and buildings	**9**	Master planning and redevelopment areas aligned with Air Quality Positive and Healthy Streets approaches	**3**	**2**	**6 Medium**	Identified as medium due to the limited number of major redevelopment areas and the moderate direct impact this will have on emissions overall. However, it can have a huge impact in those areas themselves.
Public health and awareness raising	**10**	Public Health department taking shared responsibility for borough air quality issues and implementation of Air Quality Action Plans.	**1**	**2**	**2 High**	Although this measure scores highly, it is good practice and *should* now be undertaken in all boroughs, so is not a “selected measure”, but we expect to see evidence of this in Action Plan updates.
Public health and awareness raising	**11**	Engagement with businesses	**3**	**2**	**6 Medium**	Engagement with businesses is a medium priority measure because, although it can be very effective in helping reduce emissions by supporting businesses to transition to zero in their fleet and transport, to be delivered effectively this takes a significant amount of ongoing investment and time to

Theme	Action	Measure (click on the internal links below to find more detail on each measure)	Ease of delivery	Scale of benefits	Priority level	Priority measure selection rationale
						realise the emissions reductions. Not all boroughs have access to these resources (so Mayor's Air Quality Funding (MAQF) is available to support this).
Public health and awareness raising	**12**	Supporting a direct alerts service such as Airtext, and promotion and dissemination of high pollution alert services	**1**	**2**	**2*** **High and selected**	We expect all boroughs to be supporting a direct alert service such as Airtext, because of the critical importance of providing direct alerts to vulnerable people; this is a fundamental element of delivering on air quality duties. Using social media to help disseminate the Mayor's alerts is also a low-cost way to raise awareness and reduce exposure amongst residents
Public health and awareness raising	**13**	Encourage schools to join the TfL STARS accredited travel planning programme	**2**	**2**	**4** **High**	Although this measure scores highly it is relatively straightforward and *should* be undertaken in all boroughs, so is not a "selected measure" but we would be looking to see evidence of this being successfully delivered in Action Plan updates.
Public health and awareness raising	**14**	Air quality in and around schools	**2**	**2**	**4*** **High and selected**	Schools projects can help to reduce exposure and emissions and help target one of the most vulnerable groups. In addition, as part of the school's audit programme, there is a clear roadmap and funding made available for reducing exposure at some of our most polluted schools.

Theme	Action	Measure (click on the internal links below to find more detail on each measure)	Ease of delivery	Scale of benefits	Priority level	Priority measure selection rationale
Delivery servicing and freight	**15**	Update of procurement policies to reduce pollution from logistics and servicing	**2**	**3**	**6 Medium**	The direct benefit of this is moderate. However, councils can and should be using their procurement policy and purchasing power to influence and incentivise suppliers to use cleaner vehicles wherever possible.
Delivery servicing and freight	**16**	Reducing emissions from deliveries to local businesses and residents	**3**	**2**	**6 Medium**	Implementing schemes to reduce deliveries is important, and there are a number of very successful local schemes. But as successful implementation of projects requires significant time/financial investment and therefore may not viable for all boroughs, this is a medium priority action.
Borough Fleet	**17**	Reducing emissions from council fleets	**2**	**2**	**4* High and selected**	The direct impact of this measure in terms of emissions is relatively low, given the proportion they represent of London's vehicles, but it is very important for boroughs to be leading by example, and fleets are directly within the control of the council, and for this reason it is a selected measure.
Localised solutions	**18**	Expanding and improving green Infrastructure (GI)	**2**	**3**	**6 Medium**	Moderate in terms of concentration benefits but has a number of co-benefits, and funding is provided through a variety of schemes. Please see the main table for more information on this measure and the types of interventions that are recommended.

Theme	Action	Measure (click on the internal links below to find more detail on each measure)	Ease of delivery	Scale of benefits	Priority level	Priority measure selection rationale
Localised solutions	**19**	Low Emission Neighbourhoods (LENs)	**4**	**1**	**4** **High**	This measure scores highly, but as it requires very significant levels of funding it is not a "selected measure". However, it is one that is recommended for all boroughs to consider, because Low Emission Neighbourhoods can have significant benefits in pollution hotspots.
Cleaner transport	**20**	Ensuring that Transport and Air Quality policies and projects are integrated	**1**	**1**	**1** **High**	Although this measure scores highly it is relatively straightforward and *should* now be undertaken in all boroughs, so is not a "selected measure" but we would want to see evidence of this being successfully delivered in Action Plan updates.
Cleaner transport	**21**	Discouraging unnecessary idling by taxis and other vehicles	**1**	**3**	**3** **High**	Moderate impact in terms of concentrations, but it is a highly visible emission source which is relatively easy to target, and a consistent approach across London could help to create behaviour change. We hope to see action on idling across all boroughs, and MAQF funding is available to support a consistent London-wide approach.
Cleaner transport	**22**	Regular temporary car free days	**3**	**1**	**3*** **High and selected**	This scores highly but direct emissions impacts are localised, so it is not a "selected measure" but one that is encouraged as it can prompt behaviour and attitude change towards mode shift, and increased support for Healthy Streets interventions., and MAQF funding is available to support this. Displacement must be carefully considered and more detail on this is included in the main section on

Theme	Action	Measure (click on the internal links below to find more detail on each measure)	Ease of delivery	Scale of benefits	Priority level	Priority measure selection rationale
						this topic, below.
Cleaner transport	**23**	Using parking policy to reduce pollution emissions	**3**	**1**	**3** **High**	Bold parking policies, especially to reduce parking and incentivise cleaner vehicles e.g. on metered parking could have a significant impact on driver behaviour. Furthermore, it is a measure directly in control of the council. *However, we understand that this is a new area for some councils, and that timeframes for decision making on changes are lengthy, so this is not a key selected measure in this early working draft, and we are seeking early views from boroughs on this topic and its priority rating.*
Cleaner transport	**24**	Installation of Ultra-low Emission Vehicle (ULEV) infrastructure (electric vehicle charging points, rapid electric vehicle charging point and hydrogen refuelling stations)	**2**	**1**	**2*** **High and selected**	Provision of space on borough roads for rapid chargers is vital to complement provision on TfL roads and ensure that there is an effective network, especially for business vehicles. Similarly, slower charging and hydrogen refuelling is needed at other locations to support the wide scale uptake of zero emission vehicles by the general public. There is funding and TfL support available to help with delivery.

Theme	Action	Measure (click on the internal links below to find more detail on each measure)	Ease of delivery	Scale of benefits	Priority level	Priority measure selection rationale
Cleaner transport	**25**	Provision of infrastructure to support walking and cycling	**4**	**1**	**4 High and selected**	Although walking and cycling infrastructure is governed by a separate local strategy it is so key in terms of improving air quality that it is a “selected measure”, and we would want to see high level targets and achievements reflected in Action Plans and Action Plan updates.

Monitoring and other core statutory duties	Return to main table

1. Maintaining and where possible expanding monitoring networks, and fulfilling other statutory duties

There are over 120 reference-level automatic monitoring stations in London. The majority of these are managed and funded by the London boroughs. Most measure PM10 and/or NO2, but there are also some PM2.5 monitors.

Most of these monitoring sites have been in position for many years, so they help to give a clear picture of air quality trends. They are a combination of roadside, kerbside and background sites which is crucially important in terms of monitoring trends and validating models. Boroughs also augment automatic monitoring networks with NO2 diffusion tubes which are much lower cost and so can be distributed more widely. This provides invaluable extra localised information.

Monitoring is used to inform and validate modelling and forecasting. It helps us to test and understand how effective interventions are. Boroughs have done a good job in maintaining – and in some cases increasing – their monitoring networks in recent years, despite budget pressures.

There are also several other core requirements of LLAQM with regards to reporting and action planning. Boroughs should:

- Maintain all existing automatic and diffusion tube monitoring, with a high standard of data capture.
- Seek approval from the GLA for any proposal to remove, move or add automatic monitoring stations. This must be provided in writing three months before any proposed changes.
- Seek opportunities to increase/enhance the monitoring network where possible, including installing PM2.5 monitors. Some boroughs use S106 to fund monitoring.
- Work with any emerging sensor projects where possible, including the $1m C40 project delivered in partnership with the Mayor. However, it must be reiterated that these types of sensors are a very long way from being able to replace automatic monitors. Although valuable for some applications, they do not yet provide the quality of data required for LLAQM reporting.
- Complete and submit Annual Status Reports on time.
- Update AQAPs every five years at a minimum and follow LLAQM guidance when doing this; check/amend AQMA's as required (revocation of AQMA's for PM is not encouraged, as WHO thresholds are still being breached).

Examples	Benefits
Camden and the **City of London** use S106 funding from new developments to fund some of their monitors**.**	Reduces costs to the council.
Lambeth historically did not have any diffusion tubes. They made the case internally that they were one of only two boroughs that didn't have any diffusion tube monitoring, and that it is critical to augment automatic monitors with this lower cost monitoring equipment in order to asses a wider spatial area. Since 2017, Lambeth has in place an extensive diffusion tube network to augment their automatic monitors.	Allows for a much deeper understanding of trends across the borough.

Islington are using lower cost sensors to measure the impact of some of their on-street interventions, including a City Tree forming part of the Archway Business LEN.	Although these sensors are only indicative they can provide real time monitoring of the effectiveness of localised interventions.

General Benefits	Essential for enabling awareness raising and understanding the extent of the problem and identifying targets for action and funding.
Emissions Benefits	Does not directly reduce emissions but is essential for understanding the impacts of measures to improve air quality.
Measuring success	Success could be measured by: • Maintaining existing networks (at a minimum) • Enhanced networks • Use of sensors to monitor the effectiveness of interventions

Risks/barriers	**Possible mitigations**
Risk of people not prioritising monitoring/believing that lower cost sensors can substitute for reference-level monitors	Use of this matrix, LLAQM Guidance and Cleaner Air Borough (CAB) criteria to highlight the importance of monitoring.
Risk of inaccuracy of sensors, and their effectiveness reducing over time	Should be tested against reference level monitors and used only as indicative readings. Should be tested again after 1-2 years.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low-Medium	Months/Years	**1**	**1**	**1** **High**

Emissions from developments and buildings	Return to main table

2. Ensuring emissions from construction are minimised

The main air quality risks during construction and demolition are fugitive emissions from on-site activities, transport of materials, waste and staff to and from site (logistics) and emissions from on-site non-road mobile machinery (NRMM). NRMM is dealt with separately below, this section addresses logistics and fugitive emissions.

All major developments must carry out an Air Quality Assessment. This should always include a dust risk assessment carried out in accordance with the GLA's guidance (The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance, or successor documents). Similarly, developers are required to submit a transport logistics assessment in accordance to TfL's (Construction Logistics Guidance).

Work under this section should focus on assurance and enforcement and encouraging developers to go beyond the minimum guidance requirements. It can be delivered by:

- Having a clear and regularly updated code of construction practice.
- Working to get official buy-in from planners and senior staff.
- Providing onsite checks and enforcement.
- Identifying growth areas where working with multiple developers across sites could have benefits.
- Where appropriate, working with developers to monitor and control fugitive dust emissions.

Examples	Benefits
City of London Code of Practice for developers: The City of London publish and regularly update a code of construction practice that contains up-to-date measures to control emissions from construction sites. Developers are required to abide by the contents of the Code of Practice by planning condition. This is backed up by site inspections.	Flexible and can ensure developments are best practice even at long-running developments. Clear requirements on developers and a level playing field for all developers. Less effort for the borough as construction dust management plans do not need to be checked in detail at the planning stage.
Croydon and Lewisham consolidated logistics plans Both Croydon and Lewisham are working with local developers in areas of intense redevelopment to reduce the impact of freight movements to and from construction sites. These projects work with multiple developers to help coordinate the sharing of logistics and the use of sites for temporary freight consolidation. This reduces the number of delivery vehicles across multiple sites. The Lewisham project also includes low cost indicative monitoring along affected roads to show the scheme's benefits. Participation is mandated through planning condition or s106 agreement.	Reduces the number of Heavy Goods Vehicles (HGVs) used for all of the sites incorporated in the project, with benefits for air quality. Fosters co-operation between companies that can have benefits elsewhere. In the Croydon example the initial project has been broadened out to cover more schemes across the borough and informs best practice guidance.

Islington construction monitoring officers Islington Council have introduced a section 106 contribution to fund construction monitoring officers, based on development floorspace.	Creates an effective and sustainable monitoring and enforcement process. Can be combined with other actions (for example, codes of practice, effective NRMM enforcement etc)

General benefits	Minimise exposure of residents near developments. Avoids unnecessary emissions associated with construction and demolition sites. Educates developers in best practice, which is transferable to other sites.
Emissions Benefits	A reduction will be achieved compared with the situation without the policy. The amount of pollutant emissions that can be reduced will depend on the type and size of the development and how much of a focus is given to emissions reduction beyond present policy. Croydon have developed a tool to assess emissions called Croydon Development Emissions Tool (CDET) to enable developers to assess if development plans will meet emissions reduction targets set by the Council.
Measuring success	Depending on the action, success could be measured by: • Reductions in the number of complaints associated with construction dust or traffic. • Accounting for section 106 funding received and spent on enforcement. • Numbers of site visits or inspections carried out (relative to the number of developments – for example, what percentage of sites are visited once or more per year) • Some measures may be suitable for indicative monitoring (for example consolidated logistics)

Risks/barriers	**Possible mitigations**
Requires cooperation with developers, as in some cases voluntary approaches are used to control problems at site where the borough has no statutory powers.	Set up stakeholder groups for or with local developers to ensure that they feel included in any schemes.
Enforcement may not be clear or may be split between planning and environmental health functions.	Sharing of services, or specific officers shared between the two services.
Inconsistency of application by other departments, for example planning	Provision of standard conditions for all planners. Obtaining high-level buy in from other departments, such as getting sign off from heads of planning for the Air Quality Impact Assessment

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Months/Years	**2**	**2**	**4** **High**

Emissions from developments and buildings	Return to main table

3. Ensuring enforcement of non-road mobile machinery (NRMM) air quality policies

As well as fugitive emissions from onsite activities, another major source of emissions from construction sites is from Non-Road Mobile Machinery (NRMM). NRMM used in the construction and infrastructure building sectors currently accounts for around seven per cent of NO_x and eight per cent of PM_{10} emissions in London. As emissions from road transport fall, these sectors are expected to grow as a proportion of London's total emissions. Engines used in NRMM are subjected to progressive emissions limits by the EU, similarly to road vehicles, meaning that newer machines are far less polluting than older ones.

The London Environment Strategy sets out policy for an NRMM Low Emission Zone (LEZ) with minimum emission standards for equipment used on all major and some minor development sites. The London Plan policy states that development proposals must show how they plan to comply with the NRMM LEZ. To support the above in relation to construction, boroughs should:

- Include NRMM requirements within local planning guidance.
- Include NRMM requirements within planning conditions for alibi relevant developments.
- Visit sites to inspect and enforce NRMM requirements (Islington Council fund this via S106), and for 2019-22 this will be part-funded though the Mayor's Air Quality Fund scheme
- Ensure that NRMM used by boroughs for activities such as road maintenance meets NRMM emission requirements.
- Consider if licensing or contract conditions can be used to extend the NRMM LEZ to other sectors such as roadworks and events.

Examples	Benefits
MAQF South London NRMM Enforcement project • All boroughs within the project scope were surveyed to see if conditions were being placed on the appropriate developments. Originally only half of the boroughs were requesting these conditions. This is now closer to 100 per cent. Further work must be done to ensure these conditions are met. • Created model planning conditions. • Liaised with all borough planning departments. • Identified sites that should have been conditioned and were missed. • Worked with colleagues on joint site inspections to drive compliance beyond just NRMM. • Created a framework for site inspection process including inspection and audit materials. • NRMM Practical Guide being developed to publicise framework for inspection and recommended on-site procedures. • Trained Construction Compliance officers in other boroughs • Carried out over 300 site audits Still finding that initially 50 per cent of sites non-compliant. However, after the first audit only 15-20 per cent are non-compliant. Non-compliance rates increase when focus is shifted to unregistered sites.	Regular enforcement ensures those operators who comply will see the benefits in continuing to do so. Those working towards compliance are reminded of the importance of reducing emissions from NRMM.

General benefits	Minimises exposure of residents near developments. Could result in reduced emissions on sites outside of London as operators are pushed to procure cleaner equipment.
Emissions Benefits	NRMM used in construction currently accounts for approximately seven per cent of NO_x and eight per cent of PM_{10} emissions in London. Current applicable standards are stage IIIB on construction in central London, and stage IIIA in the rest of London. These will progress to stage IV and IIIB respectively in 2020, with further tightening of the standards in 2025 and 2030.
Measuring success	Depending on the action, success could be measured by: • Percentage of development sites that comply and proportion of relevant sites inspected each year • Percentage of relevant development sites that are subject to planning condition requiring compliance with the NRMM LEZ • Number or proportion of events or roadworks required by licence or contract to comply with the NRMM LEZ • Accounting for section 106 funding received and spent on enforcement • Reductions in the number of complaints associated with construction machinery

Risks/barriers	**Possible mitigations**
Requires cooperation with developers/ NRMM operators, like how fugitive dust control measures are enforced at construction sites.	A single enforcement officer should carry out compliance assessment for all air quality aspects rather than separate visit for dust control and NRMM. This should minimise site interruptions and aid cooperation with developers/NRMM operators Checklists provided to operators prior to commencement of work should prevent non-compliant NRMM being taken to site.
Enforcement may not be clear or may be split between planning and environmental health functions.	Sharing of services, or specific officers between the two services.
Inconsistency of application by other departments e.g. planning	Provision of standard conditions for all planners. Arranging high level buy in from other departments, such as getting sign off from heads of planning for the Air Quality Impact Assessment

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low-medium	Months/Years	**2**	**1**	**2** **Key Selected Measure**

4. Reducing emissions from combustion-based CHP

To date combustion-based Combined Heat and Power (CHP) plant, predominantly gas-engine CHP, have frequently been used in new development in London as a cost-effective way of producing low carbon heat. However, there is increasing evidence that CHP plants, particularly biomass or gas engine fuelled plant, can have a significant impact on local air quality compared to using gas boilers, if not effectively abated. At the same time the carbon savings from gas engine CHP are declining as a result of the decarbonisation of the national electricity grid.

Two recent studies have highlighted how poorly installed and small-scale gas CHP plants can exacerbate poor air quality. A Kings College study - Urban Air Pollution from Combined Heat and Power (CHP) plants - found that a series of small (below 1MW) combustion-based CHP engines in close proximity to each other in Central London, contributed to 3% of the annual mean NO2 concentrations in the area. A poorly-maintained and faulty small CHP was found to have contributed 15% (around 15 µg m-3) of NO2 emissions for 21 months in the adjacent street canyon.

This study highlights the need to consider local air quality impacts of combustion-based CHP district energy schemes and raises important air quality considerations for polices that bring energy production back into urban areas and for the regulatory regime. The exact air quality impact will depend upon the technology and fuel used, the size and design of the plant, the presence of any emission abatement equipment, and the nature of emission dispersion from exhaust stacks.

A second study - Pilot Study on the Air Quality Impacts from Combined Heat and Power in London - has identified a total of 1020 facilities, spread across London. Based on the assumption that all current and permitted CHP facilities identified in the study were operational (although it should be noted that fewer than half of the identified facilities may be operational), these would make a significant contribution to London-wide emissions. The maximum potential contribution to NOx emissions is estimated to be around 14% of London-wide emissions with contributions varying from 0.8% in Redbridge, to 101% of 2013 NO_x emissions in City of London.

The plants in this study were not sufficiently large to require environmental permits and inspection by the local authority or the Environment Agency. However, there are actions which can be taken. The new draft London Plan (2017) includes a new heating hierarchy which supports a broader range of cleaner technologies whilst considering air quality to a much greater extent. Outside the planning system there are opportunities to further reduce emissions from heating systems by ensuring new, expanded and refurbished schemes make every effort to exploit low or zero emission alternatives.

Some of the key actions planning, energy and air quality officers could take are:

- Ensure that air quality as well as carbon emissions is considered when assessing planning applications or where existing schemes require new or upgraded heat sources due to replacement of existing plant or increase in existing capacity.
- Energy officers should update existing or undertake new borough-level energy masterplans to identify opportunities for new heat networks as well as extending or inter-connecting existing networks to support cleaner, lower carbon heat supply.
- Maintaining a register of combustion-based and renewable technologies. This can then also feed into a new CHP register being established by City Hall.

Examples	Benefits

Islington – The Bunhill Energy Centre and the district-wide heat network provides cheaper, greener heat to homes on several estates and buildings in the Bunhill Ward. Phase 2 of the Bunhill Heat and Power network is now being built and it will include a second energy centre that will capture waste heat from the Tube network and integrate it into the heat network serving local homes and businesses.	Cheaper and greener heat for local people. Makes use of local secondary heat source, waste heat from the Tube network. The project has been carried out with air quality impacts in consideration and so includes a provision for local air quality monitoring.
Southwark - Developing proposals for district heating scheme from south east London CHP in Deptford	Consultation with developers at design stage to ensure that latest London Plan policies to make the best use of existing sources of heat can be considered at early stages of local developments. Good example of using a waste heat source.

General benefits	Promoting the use of waste heat as part of district heating networks, and minimising the impacts of existing combustion based CHP plant should reduce any negative impacts on local air quality.
Emissions benefits	Even with abatement equipment fitted standard combustion-based CHP heating systems can produce as much as anywhere from 5 to 170 times the NOX emissions per kilowatt hour unit of gas/electricity heat generated. Where existing combustion-based CHP systems are replaced, emissions reductions should be simple to calculate – for example “old system annual NOx emissions” – “new system annual NOx emissions” = Annual NOx savings Where waste heat is captured and integrated into a heat network to replace an existing heat source then the NOx savings will be the total NOx emissions from the heat source being replaced on the network.
Measuring success	Success could be measured by: • Number of secondary heat sources integrated into heat networks • number of existing combustion-based CHP engines removed/replaced with cleaner, lower carbon heat sources • total NO_x savings from actions (and PM where biomass is replaced) undertaken in respect to heat networks

Risks/barriers	**Possible mitigations**
Privately owned heat networks may be resistant to change their primary heat source	Long term engagement with the heat companies and emphasis of the benefits from both a carbon and air quality perspective and the future proofing and resilience of the network.

Misunderstanding of policy may cause developers to promote the use of onsite combustion-based CHP and Biomass plant on sites that aren't appropriate for these technologies, not realising the negative air quality impacts.	Consultation with developers around connecting to existing heat networks, and where this isn't possible, consideration of the most appropriate heat sources for the development and discussion around the London Plan's heating hierarchy at the application stage of developments. Signposting developers to the London Plan Policy Sustainable Infrastructure (SI3) - Energy Infrastructure - to illustrate the hierarchy of communal heating heat sources. SI3 only supports new combustion based CHP in limited circumstances and does not support the use of biomass

Cost to borough	Timescale for Impact	Ease of Delivery	Magnitude of AQ Benefits	Priority Level
Low-Medium	Months/Years	**4**	**1**	**4** **High**

Emissions from developments and buildings	Return to main table

5. Enforce Air Quality Neutral policy

Air Quality Neutral is a benchmark standard for new buildings. It is designed to ensure that they do not emit more pollution than existing buildings of the same type.

The requirement for all major developments in London to be at least Air Quality Neutral was first introduced in the London Plan 2011. To ensure these developments are neutral in terms of air quality, developers needed to show that both transport and building emissions linked with their proposals would be below benchmarked emissions. This follows the methodology in the sustainable design and construction SPG (https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/sustainable-design-and), or successor documents.

The London Plan now requires that all developments meet Air Quality Neutral standards, and introduces Air Quality Positive for Master Plan scale developments.

Boroughs should ensure that this policy is enforced. They should ensure that developers consider this requirement at the outset, so that it can be integrated easily at design stage. This will reduce, or ideally remove, the need for mitigation measures or the off-setting of emissions in case developments do not meet the relevant criteria. We encourage boroughs to include Air Quality Neutral requirements in their own Local Plan and/or Supplementary Planning Guidance documents and standard planning conditions.

Actions boroughs could take include:

- Agreeing standard planning conditions to require compliance with air quality neutral standards and submission of details prior to occupation for all developments.
- Knowledge sharing with planners, so that they can assess basic compliance in cases that are otherwise non-contentious for air quality.
- Ensuring conditions and requirements are enforced and monitored.

Examples	Benefits
Barnet has incorporated the Mayor's air quality neutral policies into its 2016 Sustainable Design and Construction Supplementary Planning Document which all new developments have to follow. Most other boroughs have also incorporated these requirements into local planning policy.	Reinforces the message to developers by reiterating London-wide policies into local guidance documents
Brent – Applications with boilers or other heat sources are given a standard planning condition which requires pre-occupation information or testing reports to be submitted to the council.	Ensures that commitments outlined in the planning application are delivered in practice.

General benefits	Reduce the contribution to pollution from new development. Minimise exposure to residents of new developments from the onset.

Emissions benefits	The Air Quality Consultants report Air Quality Neutral Planning support Update has several case studies which outline the emissions reductions of offsetting amounts that will be realised through adopting air quality policy. A large mixed-use development (240,000m^2) including one gas fired CHP unit and four gas fired boilers is calculated to have total building NOx emissions of 17.3 tonnes a year. The air quality neutral benchmarks for the development will allow only for NOx emissions of 8.4 tonnes a year. Some 8.9 tonnes a year of NOx will therefore be saved through either onsite measures or by off-setting.
Measuring success	• Number of development proposals meeting the air quality neutral standards

Risks/barriers	**Possible mitigations**
Lack of effective planning enforcement can limit effectiveness.	Enforcement of Air Quality Neutral policies to be written into local authority planning documentation / SPG to ensure enforcement becomes business as usual. Use of standard planning conditions, requiring submission of details prior to occupation. This can reduce the burden of enforcement and increase confidence that policies are being enforced.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Months/Years	**2**	**2**	**4** **High**

Emissions from developments and buildings	Return to main table

6. Ensuring adequate, appropriate, and well located green space and infrastructure is included in new and existing developments

The London Plan acknowledges that the existing natural environment should be protected and enhanced, and new green space and infrastructure should be supported.

Green walls, trees and other green infrastructure may not have much significance in terms of reducing air pollution. It can also help to reduce people's exposure, when used as a well-designed buffer between emission sources and population as a barrier or as a place of refuge. Extra consideration should be given to new developments containing sensitive receptors, such as schools and care homes. This green infrastructure does however offer many other benefits, in particular, in relation to potential energy savings from buildings.

Green space on new developments can provide a range of important functions. For example, it can be a way to set the building back from the kerbside. This reduces the exposure of occupants. It can also provide multiple benefits where this infrastructure forms part of a sustainable urban drainage system.

Other green infrastructure like trees, hedges and green walls can also be a barrier between roads and new developments. At the same time, green infrastructure can serve important amenity functions, such as children's play parks or as traffic free walking and cycling routes. Placement and design of these amenity spaces should be carefully considered to ensure that they do not increase exposure and, ideally, serve to reduce overall exposure to pollution.

Boroughs should make sure that new development proposals integrate green space and infrastructure. They should explore potential avenues to maximise the benefits, especially in areas of particularly poor air quality such as Air Quality Focus Areas and developments which will serve sensitive demographics in heavily concreted areas (schools, hospitals, elderly care homes along main roads). This could be achieved by:

- Implementing a mechanism for air quality and parks officers to jointly comment on green infrastructure
- Recording and benchmarking the levels of green infrastructure in developments and setting targets to improve on levels and quality of green infrastructure provided
- Ensuring that exposure in amenity spaces is considered at the design stage and as part of the Air Quality assessment for new development and redevelopment proposals

Examples	Benefits
The Reubens Living Wall (Victoria) The Victoria Business Improvement District (BID) commissioned a feasibility study for a living wall. Following this the concept was concept designs were developed to become the project at the Palace living wall. The Rubens at the Palace hotel living wall in Victoria covers an area of 450m^2 and includes a staggering 10,000 plants. One of London's largest living walls, it weighs in at about ten tonnes. It has 22 different pollinator friendly plant species including buttercups, crocuses, strawberries, spring bulbs and winter geraniums. This mix provides waves of blossoming plants throughout the year.	The project came about through a collaboration between the Victoria BID and the hotel. Hotel staff took pride in the installation of the living wall, and its energy and water saving benefits are a reminder of the hotel's environmental policies and practices.

General benefits	Many co-benefits from green infrastructure such as climate change adaptation, sustainable urban drainage, reduction of the urban heat island effect, biodiversity and quality of life. Can be implemented in areas of vulnerability acting as a barrier between receptors and areas of high concentrations (for example. schools and main roads). Potential to link new and existing green infrastructure provision, increasing the benefits.
Emissions benefits	Green infrastructure schemes can transform urban areas and help to provide improved public spaces. Whilst it can be hard to quantify air quality exposure improvements from such schemes it may therefore be useful to consider such schemes as part of the Healthy Streets Approach or to look at the measures of success built into Green Infrastructure proposals.
Measuring success	• Numbers of proposals or projects where green infrastructure is used or enhanced to provide low exposure walking and cycling routes • Proportion of major planning applications where green amenity spaces are in areas of low exposure. • For stand-alone green infrastructure projects consider using exposure reduction targets as project KPIs

Risks/barriers	**Possible mitigations**
As responsibility for green space sits primarily with Parks it may not be prioritised as an air quality issue and resource-constraints may limit joint working.	Engage with Parks service to identify joint priorities, such as increased use of green spaces.
Expensive green walls or inappropriate planting installed as an “air quality mitigation” that is not effective.	Focus on the use and design of committed green infrastructure to ensure that it works to reduce exposure rather than introducing requirements for additional GI
Doesn’t address the source of pollution.	Additional green infrastructure should not be used to mitigate or excuse excessive pollution sources. Action should focus on getting the most out of green infrastructure that is proposed to meet other planning requirements, or that already exists.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Years/Decades	**2**	**3**	**6 Medium**

Theme	Emissions from developments and buildings	Return to main table

7. Declaring Smoke Control Zones and ensuring they are fully promoted and enforced

Recent research suggests that wood burning is responsible for between 23 and 31 per cent of the urban derived $PM_{2.5}$ in London.

All London boroughs have declared Smoke Control Zones, under the Clean Air Act 1993, covering some or all their area. Emissions of dark smoke from chimneys are not allowed in these areas. However, exceptions are made if the appliance being used has been tested to ensure it meets relevant emission limits or the fuel being burned is certified as smokeless.

Defra maintains a register of 'exempt' appliances on its website. It is thought many Londoners are unaware that they live in a Smoke Control Zone and are installing non-exempt appliances. More commonly, they're burning fuel that is either not smokeless or not appropriate for their appliance.

There are currently insufficient powers for boroughs to enforce Smoke Control Zones fully; the Government is considering amending these, and the GLA is lobbying for more and better powers. However, there is still some action that boroughs can take to address this emission source; boroughs could:

- Actively enforce under the Clean Air Act where breaches are observed, rather than relying on nuisance legislation
- Raise awareness: Research suggests that many Londoners are unaware that they live in a Smoke Control Zone and are unintentionally breaching legalisation, therefore, boroughs should provide more information surrounding current legislation and consequences to the public. This could include:
    - An awareness campaign with residents to include the provision of visible advice on fuels and appliances at point of sale, as well as information on bonfires and barbeques. Please see the Government website and industry schemes such as Ready to Burn to assist with this.
    - Engaging local suppliers within smoke control zones to ensure only appropriate technology and fuels are sold. This could include a recognition scheme for responsible vendors
- Provide and publicise garden waste collection services to reduce bonfires

Examples	Benefits
EcoDesign Ready is a European-wide programme to lower emissions. It is a Stove Industry Alliance (SIA) agreement to make wood-burning stoves to meet the new EcoDesign Ready criteria. It is due to come into force in the UK in 2022.	Boroughs could share information about the law change before 2022. This could help encourage early uptake.
Ready to Burn is a certification mark for wood log suppliers who can show to Woodsure their logs have moisture content below 20 per cent. This accreditation scheme focuses on pre-packed wood fuel.	Research suggests that wet wood fuel contributes far more to particulate emissions than dry wood. Changing consumer habits is the best way to address this issue. An awareness campaign could reap huge benefits.

Barnet gave out smoke control leaflets to shops selling wood burning stoves and restaurants using charcoal grills and pizza ovens as part of a MAQF project. The council also used a scientific support team to monitor complaints (on average five a year) and take action via information campaigns.	Engaging suppliers helped to make sure they sold/used appropriate fuels. Scientific support enabled the council to use information campaigns to target problem areas.

General benefits	This is a little understood problem, which is on the increase. Projects promoting smoke control zones produce material which could be very reproducible. Any lessons learned will be applicable to other local authorities where small-scale solid-fuel use is increasing.
Emissions Benefits	King's College estimate that between 23 and 31 per cent of the PM2.5 originating in London comes from wood burning. Reducing this would clearly have a huge impact on PM2.5 emissions.
Measuring success	• Estimated reach of awareness campaigns • Number of suppliers engaged • Increased enforcement

Risks/barriers	**Possible mitigations**
Wood burning stoves are not thought of as an air quality problem by most people. That means there may be little appetite for a change in fuel type or appliance.	Increase awareness of smoke control zone legislation and the health impacts of $PM_{2.5}$ via public engagement and by educating stove suppliers. Provide information around health effects of burning of inappropriate fuels.
Authorised fuel may be stored inappropriately. This can cause moisture content to increase unacceptably.	When giving literature on suitable fuels make sure it addresses fuel storage as well as fuel type.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low – Medium	Months/Years	**2**	**1**	**2** **Key Selected Measure**

8. Promoting and delivering energy efficiency and energy supply retrofitting projects in workplaces and homes through EFL retrofit programmes such as RE:FIT, RE:NEW and through borough carbon offset funds.

Gas boilers are the second largest individual source of NOx in London, they also contribute significantly to indoor air pollution.

RE:FIT, RE:NEW and the Decentralised Energy Efficiency Programme (DEEP) are part of the Mayor's £34 million Energy for Londoners programme which aims to make London's homes warm, healthy and affordable, its workplaces more energy efficient, and to supply the capital with more local clean energy. RE:FIT helps make London's non-domestic public buildings and assets more energy efficient. It supports a range of government, NHS, education, and cultural and heritage organisations to roll-out retrofit projects. RE:NEW is similar but focuses on home energy efficiency. In eligible homes the Mayor's Warmer Homes programme will replace old boilers and install insulation, in combination with other energy conservation measures.

RE:FIT, RE:NEW and DEEP are helping to achieve the ambitious target for London to be a zero carbon city by 2050.

To help promote and deliver projects using the RE:FIT, RE:NEW and DEEP programmes, here are some key actions boroughs should take:

- Distribute information on support available and benefits of current RE:FIT, RE:NEW and DEEP programmes to stakeholders (and within their own borough!) encouraging uptake (housing associations, universities, schools etc).
- Use of RE:FIT for projects targeting council owned infrastructure such as offices or other council buildings.
- Ensure that any applications for boiler replacement or upgrade under these programs specify ultra-low NOx boilers.
- Use DEEP to support RE:NEW and RE:FIT in identifying opportunities, in areas with heat networks, for removing gas boilers from existing buildings and retrofitting those buildings so that they can be connected to a local district heating network.

In 2018, RE:NEW will be replaced by a successor programme. This will target technical support work to programmes that achieve deeper levels of retrofit and air quality improvements.

Find out more: https://www.london.gov.uk/what-we-do/environment/energy.

Examples	Benefits
Sutton used RE:FIT programme to make the borough's buildings more energy efficient. This included lighting upgrades, boiler control upgrades and heating system insulation, via the procurement framework. They chose a range of buildings of different ages / conditions including libraries, offices, depots, a public hall and the Civic Centre.	Sutton saved energy and CO_2. In the second year, this reduced its carbon footprint by 484 tonnes of CO_2, equivalent to the annual carbon emissions of almost 130 average-sized homes.

Hackney Council is now completing a heating upgrade of 800 homes in the borough. The project has replaced expensive individual electric heating with communal gas boilers, cutting both tenants' fuel costs and CO_2 emissions. The project was contracted via RE:NEW's procurement framework in spring 2014,. It aimed to reduce fuel poverty by placing a high priority on finding the cheapest form of heating for tenants.	Hackney Council has worked with RE:NEW's support team for two years. It has already replaced 600 units, helping to cut these residents' fuel bills in half.
Enfield's retrofit project to install ground source heat pumps in 400 flats is well underway. The RE:NEW support team gave a technical review of the tenders received by the council.	Enfield is retrofitting eight tower blocks in the borough. The heating upgrade is expected to reduce residents' energy bills by 30-50%.
Royal Botanic Gardens (RBG) Kew has taken advantage of the guaranteed energy savings offered by RE:FIT to implement energy conservation measures. These include LED lighting, boiler load controllers and voltage optimisation.	RBG Kew has saved energy and reduced CO_2. It has also reduced its carbon footprint by 720 tonnes of CO_2 per year. That's equivalent to the annual emissions of over 190 average-sized homes.

General benefits	• Associated NOx reductions for all gas energy efficiency measures and any boilers either replaced with ultra-low NOx plant or by a connection to a local district heating network. • Energy savings related with updating boiler efficiency. • Cost savings due to energy savings. • In RE:FIT's case, guaranteed energy savings
Emissions Benefits	The Mayor's Better Boilers scheme introduced an ultra-low NOx requirement for the replacement boilers. This has led to significant NOx reductions as well as saving up to 310 tonnes of CO_2 a year. Since it was created in 2009, RE:NEW has helped improve over 131,000 of London's homes, saving over 47,000 tonnes of CO_2 a year. Replacing gas boilers with a connection to a local district heating network removes the source of local heating related NOx emissions.
Measuring success	As both RE:FIT and RE:NEW are registered programmes, measuring the number of schemes in different boroughs should be relatively easy. For RE:FIT as the programme guarantees the amount of CO_2 emissions reduced so this again should be easy to track. Through the RE:NEW scheme tracking it should be possible to track the percentage of different boroughs' social housing stock which has been updated through the scheme. Where the boiler emission rate or NOx class is known direct savings can be calculated from reductions in the boiler use.

Risks/barriers	Possible mitigations
Relating to the RE:NEW programme, residents may not see the advantages of replacing a boiler that they believe is working 'fine'.	Cost savings to be outlined as well as CO_2 reduction.
Current scheme is voluntary and requires start-up capital. This can be off-putting (see examples), so effectiveness depends on the ambition of housing providers, etc.	Boroughs could counter this by sharing information on support available and calculating guaranteed energy savings.
Potential users could be put off by perceived procurement challenges of new energy efficient products	Stress the pre-existing procurement framework set up through the RE:FIT and RE:NEW programmes and the ease of contacts programme teams.

Cost to borough	Timescale for Impact	Ease of Delivery	Scale of Benefits	Priority Level
Low	Months/Years	**3**	**1**	**3** **Key Selected Measure**

Emissions from Developments and Buildings	Return to main table

9. Master planning and redevelopment areas aligned with the Air Quality Positive and Healthy Streets approaches

Air Quality Positive is a new approach and subject to approval at an Examination in Public (EIP) alongside the London Plan to large scale development. It seeks to exploit the ability of large developments to shape their area to build in benefits for air quality.

An Air Quality Positive development should be:

- Design-led, seeking to use the form and layout of a development to improve air quality and reduce exposure; preventing accumulation of pollutants and improving dispersion where possible. At the same time, different uses within the development should be well located.
- Holistic in its approach to air quality, seeking to both reduce the need to use polluting technologies (like combustion based transport and heating) and reduce the need for users to expose themselves to existing pollution sources as they go about their daily lives.
- Outward looking, seeking to improve the area around the development as well as the space inside. That means new public amenities or high streets are most easily accessible by low exposure routes and sustainable transport (which link properly to existing or planned provision outside the site.)
- Future proof, enabling zero emission technology and the smart systems that support it to be easily deployed.

This is a new way of thinking about air quality in developments. The GLA will work with developers and host boroughs to explore how Air Quality Positive can be realised in developments and share best practice and innovation as it emerges.

The Healthy Streets Approach is a framework for putting human health and experience at the heart of planning the city's streets. Environmental factors have a big impact on the way people interact with the places around them, so improving the environment is a core feature of Healthy Streets. Good performance against each of the ten evidence-based Healthy Streets Indicators means that individual streets are fair, inclusive and sustainable environments. This helps to move the balance of street use away from car dominance.
TfL has produced a Healthy Streets Toolkit which includes guidance, full descriptions of the Healthy Streets indicators and a tool for development designers to check how their scheme fits the Healthy Streets approach.

The key action for boroughs is to ensure their planning and redevelopment teams know to consider new policies on air quality positive and healthy streets at an early stage in the development of plans. They should also engage with GLA and TfL resources to support the development and deployment of these policies.

Examples	Benefits
Narrow Way, Hackney Central (Hackney, London) Narrow Way is a single-lane high street and busy bus route in Hackney Central, north London. Historically it suffered from severe traffic congestion, which led to air and noise pollution. This, alongside a lack of clear identity, also led to many shops struggling on what should have been a vibrant and busy high street. A trial of pedestrianisation, which closed the street to vehicles, has led to a permanent scheme being put in.	After the trial, both shop-owners and pedestrians were happy with the changes. Qualitative research provided a case for the benefits and helped to encourage more public space improvements in the neighbourhood. And although no air quality monitoring was undertaken similar schemes have led to reductions in pollution in the street.

General benefits	• Air Quality Positive supports the creation and deployment of the infrastructure needed to support the widespread adoption of zero emission transport and zero emission buildings. • Healthy Streets empowers local authorities, developers, local businesses and residents to consider how streets can be made to be nicer places to be. • Takes a holistic view to improving public spaces and new developments rather than just considering one aspect. • Wider benefits (safety, increased footfall and public health).
Emissions Benefits	Air Quality Positive will rely on the selection of suitable measures on a case by case basis for developments, impacts on emissions and concentrations will vary from scheme to scheme. General metrics will be considered as part of the guidance. The Healthy Streets approach encourages focus on a number of different factors; many different initiatives are undertaken under the Healthy Street umbrella. Quantification of emissions reductions is therefore difficult as it will depend on the scheme being undertaken.
Measuring success	• For Air Quality Positive specific metrics of success will be expected to be proposed for each selected measure, and more detail on this will be provide in new Guidance accompanying the London Plan • For Healthy Streets success should be measured against the ten Healthy Streets indicators.

Risks/barriers	**Possible mitigations**
Lack of effective planning enforcement can limit effectiveness.	Adoption of Healthy Streets Approach as a mandatory consideration in planning guidance.
Healthy Streets Approach focuses on several different indicators of which clean air is one. There is a possibility that in addressing concerns around other indicators air quality is worsened.	Holistic approach taken to Healthy Streets approach involving stakeholders from planning, transport, public health and environmental health.
Air Quality Positive is a new policy approach building on Air Quality Neutral, and subject to approval at EIP alongside the London Plan and its implementation is currently being defined.	The GLA will publish initial guidance on Air Quality Positive in 2018. It only applies to very large development schemes. This ensures that the scheme design phase has the time and resources to consider complex requirements and that the development is able to contribute effectively.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Months/Years	**3**	**2**	**6** **Medium**

Public Health and Awareness Raising	Return to main table

10. Public Health department taking shared responsibility borough air quality issues and implementation of Air Quality Action Plans.

The LES outlines that protecting public health is at the heart of the Mayor's efforts to improve air quality. Boroughs have integrated Public Health Departments and responsibilities to deliver against the Public Health Outcomes Framework. It is therefore of critical importance that air quality teams work closely with Public Health. Boroughs should ensure that:

- Directors of Public Health (DPHs) are regularly briefed on the scale of the problem in their local authority area; what is being done, and what is needed.
- Public health officials are actively involved in air quality engagement with local stakeholders (businesses, schools, community groups and healthcare providers).
- DPHs have incorporated up to date air quality information within their Joint Strategic Needs Assessment (JSNA).
- Air Quality Action Plans are formally signed off by the DPH.
- Public Health Officers should sit on air quality steering groups, and at least one Consultant grade public health specialist within the borough has air quality responsibilities outlined in their job profile.

Examples	Benefits
The City of London Corporation: The City of London Health and Wellbeing Board (HWBB) carried out a scientific review and consultation. It assessed how air pollution affects public health in the city and which relevant policies the H&WB has powers to amend to effect change. The review collated the latest evidence on air pollution to understand the scale of the problem and the relevant legislation and local strategy including public health, transport, and development and planning. In addition, the review examined how poor air quality can negate local area enhancement strategies and schemes. These points were then developed into a set of strategic recommendations for the HWBB and converted to actionable plans via a series of workshops with key stakeholders.	A strong evidence base and cross-council support for air quality has led to more officers working on air quality and the adoption and delivery of several bold policies and projects. The City of London is quite unique compared with other boroughs. However, this approach of ensuring strong buy-in not just from environment and transport teams but also from Public Health can be replicated to drive action across other boroughs.
Barts Health NHS Trust teamed up with City Hall, its four London boroughs and behavioural change charity, Global Action Plan, to create a cross-sector collaboration. The aim is to take practical action to benefit patients and local communities. The programme was built around a series of practical projects which sought to engage and empower a wide range of individuals. This included both those delivering frontline care in hospitals and in the community and those who were most affected and at risk from exposure.	Key project achievements were: • 6,000 cleaner air packs given out • 1,210 patients given a Breathe Better Plan after completing a survey • 143 fleet staff engaged. 60 drivers were trained using an eco-driver simulator • 300 Barts Health professionals trained • Monitored background NO_2 observed to reduce to below the annual mean objective after the project.

General benefits	• Helps to ensure DPHs are fully informed of the scale of the problem. • Ensures accountability due to DPHs increased responsibility for delivery on air quality. • Potential financial savings to NHS from improved health outcomes. • Ensures enhanced coordination of efforts. • Inclusion of public health can lend significant weight to campaigns and communication. • Helps to ensure air quality is prioritised and that work on this agenda is recognised and easily evaluated through checking success of outcomes.
Emissions benefits	Following the Barts Health NHS Trust Cleaner Air Project the monitored background NO_2 concentrations at the hospital reduced from 42.6 µg/m^3 (2012 to 2014 average) to 37.8 µg/m^3 in 2015. This represents a fall in the NO_2 concentration to levels within the 40 µg/m^3 annual mean air quality objective. The Great Ormond Street Hospital Clean Air Zone project in Camden increased the percentage of taxis booked through the hospital that are be either low emission or zero emission from around 70 to 91 per cent.
Measuring success	Signs of success would include: • DPH taking an active role in borough air quality action plans and steering groups, and public health teams being actively involved in the delivery of relevant projects. • At a minimum air quality should be in Joint Strategic Needs Assessments. Model practice would be to include it within Health and Wellbeing Board priorities.

Risks/barriers	**Possible mitigations**
Ineffective engagement with DPH could lead to air quality being viewed as a burden rather than a genuine Public Health issue.	Senior and cabinet-level support for air quality is vital. Clear and concise ways of engaging with all tiers of Public Health and other teams should be developed

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Weeks/Months	**1**	**2**	**2** **High**

Public Health and Awareness Raising	Return to main table

11. Engagement with businesses

Businesses are responsible for a large proportion of emissions in London:

- The London Atmospheric Emissions Inventory 2013 estimates that commercial boilers are responsible for 9.2 per cent of London's NOx emissions.
- Heavy and light goods vehicles contribute to 34 per cent of road transport NO_x emissions in London. A major reason for this is vehicles providing deliveries and servicing to London's businesses and organisations.
- Local energy generation and back up diesel generators in commercial buildings is also an issue, especially in central London.

To reduce emissions, it is important to engage with local businesses to manage the air quality emissions they produce, such as:

- Developing a local scheme or campaign such as the Zero Emission Network, to provide tailored advice and support to businesses on how to reduce emissions.
- Encouraging businesses to become members of LoCITY so they receive the latest information on new vehicles, grants, etc.
- Engaging with local business improvement districts (BIDs) – many of them are very keen to do more on air quality and can often access some BID-specific funding schemes. They can also support procurement-led consolidation/delivery reduction projects.
- Ensuring that Town Centre improvement projects consider air quality and focus on mode shift.
- Considering incentives for businesses, like parking/loading for those using cleaner vehicles.

Examples	Benefits
The Zero Emissions Network (ZEN) is a partnership project between the London boroughs of Hackney, Islington and Tower Hamlets. It is supported by the Mayor of London. ZEN has successfully recruited over 1,500 businesses to the network. It helps network users to reduce emissions through several different schemes. The network offers grants, advice, events and free trials of various vehicles including electric vans, electric scooters and even cargo bikes. The trial allows users to test if the low emission vehicle works for their needs before committing to buy. If suitable the network can then recommend appropriate suppliers.	Creates a strong local brand and network whereby businesses encourage each other to reduce emissions. Provides practical support and advice. Since it was established in 2012, the network has gained over 1,500 members from across Clerkenwell, Shoreditch and Spitalfields and has implemented over 600 emission reducing initiatives.
The Cleaner Air Better Business (CABB) programme is supported by the Mayor's Air Quality Fund. It brings together several London boroughs and business improvement districts (BIDs) to improve air quality thorough actions such as: • Making deliveries to businesses more efficient • Addressing the air quality impact of online shopping • Developing and promoting 'clean air walking routes • Delivering environmental improvements to mitigate air pollution and encourage active transport • Communicating air quality messages with the business community	Key achievements of the CABB so far include: • London's first Wellbeing Walk. • 15,000 bespoke clean air route maps distributed with WeAreWaterloo BID • 68 Change Makers advised drivers why they should switch off when stationary during Cleaner Air Fortnight • Route mapping widget on seven BID websites

LoCITY was launched by Transport for London (TfL) in January 2016 to encourage the uptake of low emission commercial vehicles. It is a five-year industry-led collaborative programme with 1,300 members from 819 organisations. The project has funded independent research to provide technology neutral and accurate advice to businesses. Free to use tools are available online to support fleet managers understand whole life ownership costs, the real world range of electric vehicles, and a refuelling and recharging infrastructure locations map covering the whole of the UK.	LoCITY has created a strong and influential network which links fleet operators, central and local government, vehicle manufacturers, and refuelling and recharging suppliers. Three quarterly working groups, an annual conference and regular roadshows help demonstrate the latest technology and share practical tips on how businesses can successfully to transition to alternative fuelled vehicles.

General benefits	• Boroughs can use existing communication channels and relationships with BIDs and businesses. • Reduces staff exposure as well as emissions. • Provides an opportunity for businesses to work together to maximise benefits. For example, encouraging the businesses in an area to coordinate their deliveries and collections more efficiently, and adopt collective and/or collaborative procurement practices.
Emissions benefits	Engagement with business as part of the first round of the ZEN reduced NO_x emissions by 114.2kg a year through several different schemes including: • Trailing of zero emission cargo bikes for delivery, resulted in the purchase of 7 bikes for permanent use. NO_x emissions reduced by 30.8 kg a year. • Free business membership to Zipcar - NO_x emissions reduced by 56.8 kg a year. • Free cycle training and Cycle workshop for ZEN members - NO_x emissions reduced by 10.6 kg a year.
Measuring success	Metrics could include: • Number of businesses actively engaged on air quality. • Number of businesses acting to reduce emissions.

Risks/Barriers	**Possible mitigations**
Businesses are likely to have other priorities	Promote the benefits of engagement to the business, and offer incentives and practical support

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Medium	Weeks/Months	**3**	**2**	**6** **Medium**

Public Health and Awareness Raising	Return to main table

12. Supporting s direct alert service such as Airtext, and promotion and sharing of high pollution alert services

Proposal 4.1.1 of the LES states the Mayor will provide better information on air quality. This is especially during high and very high pollution episodes. Timely air pollution data gives vulnerable people a chance to act to protect themselves, for example by reducing their exposure, or simply by carrying their medication.

London-wide episodes of high pollution happen a few times each year. Very high pollution episodes are even more rare – occurring only every few years. On such occasions, it is vital that Londoners are kept fully informed and can respond accordingly to minimise health impacts.

The Mayor provides a pollution alert service which provides high and very high pollution warnings across the TfL network, including digital signage at bus stops. In addition, advice is provided for moderate, high and very high pollution alerts via social media and by email. This is sent to institutions looking after vulnerable groups, such as care homes and schools. These alerts differ from the forecasts provided by Defra, which do not include any alerting element and so can only be viewed by visiting their website, whereas the Mayor's alerts are proactively disseminated.

The Mayor and most London boroughs also support the airTEXT service, which sends direct alerts via text message to people who've registered for the service.

These complementary systems provide a comprehensive alerts service which both notify the general public and vulnerable groups via the Mayor's channels, and directly targets vulnerable individuals who may be digitally excluded via airTEXT. The airTEXT service is invaluable for people with heart and lung conditions that are worsened by poor air quality.

Boroughs could support the high pollution alert services by:

- Funding the airTEXT text message (or equivalent) service for their borough (currently £1,000 a year).
- Promoting the airTEXT (or equivalent) service to people with heart and lung conditions (working with Public Health and local GPs, chemists, etc).
- Re-publicising the Mayor's social media pollution alerts through their own comms and social media channels.

Examples	Benefits
***Air*TEXT** is a free service for the public provided by CERC, which sends forecasts of air quality by SMS text message, email or voicemail. These are made using the *air*TEXT air pollution forecasting and alert system. The concentrations of four pollutants (nitrogen dioxide (NO_2), particulates (PM_{10} and $PM_{2.5}$) and ozone (O_3)) are calculated. From the concentrations, the Daily Air Quality Index (DAQI) of each pollutant is derived.	Early warning via text message to vulnerable people, especially those who may be digitally excluded. This enables people to take steps to protect their health.

The Mayor's high pollution alert service – shown on public transport display boards and via direct emails to stakeholders such as schools.	Provides information to the public and targeted emails to schools, care homes and GP surgeries. This raises awareness and points people in the direction of help and advice.

General benefits	• Minimal and marginal cost to boroughs as can use existing channels. • Exposure reduction. • Potential to reduce strain and resource implications on the National Health Service.
Emissions benefits	This is an exposure reduction initiative, as opposed to targeting emissions.
Measuring success	• Sign-ups to airTEXT in the borough • Engagement with vulnerable groups • Estimated reach of pollution alerts within the borough (via social media et.) • Reduction in hospital admissions

Risks/barriers	**Possible mitigations**
Confusion between the different alert services and the complementary and critical role that they play.	Clear understanding of the role of each service – hopefully the information provided above will help with this.
There is a risk that an over-focus on high pollution days downplays the need to improve air quality more generally. For example, "it's not a high pollution day, so air quality must be ok".	Ensure that webpages and communications have information on health impacts and limit values.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Weeks/Months	**1**	**2**	**2** **Key Selected Measure**

Public Health and Awareness Raising	Return to main table

13. Encourage schools to join the TfL STARS accredited travel planning programme

STARS (Sustainable Travel: Active Responsible Safe) is a TfL accreditation scheme. It rewards London schools and nurseries for rolling-out safer and sustainable travel activities. These help to reduce car use and increase walking and cycling on the journey to school as well as more responsible use of public transport. Schools can achieve a higher level of accreditation based on the number of active travel activities in place and how effective they are in reducing car use. Since the scheme started in 2007, STARS schools have replaced over 13 million miles of car journeys with active travel, helping to create a less congested, healthier London.

Boroughs should:

- Encourage schools to engage with the STARS scheme and gain accreditation and
- Share their good news stories and activities - via the STARS website

Examples	Benefits
Ealing STARS Reward Scheme offers small grants of up to £500 to schools that develop and maintain their STARS accreditation. The grants are used to promote at least one aspect of safer and smarter travel choices (walking, cycling and public transport) and help the school reduce congestion nearby.	The grants encourage schools to maintain their STARS programme and allows the borough to share stories and promote successful strategies to other schools.
Winterbourne Junior Girls' School, Croydon – The school succeeded in gaining bronze accreditation and is now moving towards silver. Although around 90 per cent of students already walked to school this increased via walking to school activities. Additionally, road safety was promoted through road markings on the school playground to help children learn how to interact on the road.	The STARS scheme gave them an extra incentive to bring activities together to promote a sustainable and safe approach to travel.
Coopers' Company and Coborn Secondary School, Havering - The school was successful in getting the Gold STARS Award. Activities included: • An active travel plan working group including both students and staff • Bikers' breakfast – a scheme which rewarded students with a free breakfast if they cycled to school • Bike polo – an activity to improve cycling skills to enable students to be more confident when cycling on the road	Setting up a travel plan working group involving students made them more invested in changing their behaviours, and helped the school understand what factors stop children from using sustainable transport.

General benefits	• Increases awareness of air quality as an issue and can increase support for measures to improve air quality and public health, for example smarter travel and reduced idling. • Activities can help reduce exposure of children to high levels of pollution which can have serious lifelong health and cognitive impacts, so any improvement centred around this demographic is significant.
Emissions benefits	The programme saves about 22 million vehicle kilometres (VKM) annually between 8-9am. Total 44m VKM a year. This is a mean saving of roughly 8,000 tonnes of CO_2 per annum. Calculations show this can be estimated as an equivalent saving of around 96 tonnes of NO_x per year. 45 per cent of London schools are currently enrolled in the STARS scheme. If all London schools took part, savings of around 215 tonnes of NO_x a year might be achieved.
Measuring success	• Success should be measured through the percentage of schools in the borough which have engaged with the scheme and mode shift achieved away from the car. • Further to this, success can be measured by the level of accreditation obtained by the schools (bronze, silver or gold) and activities undertaken to maintain this level once the school is accredited.

Risks/barriers	**Possible mitigations**
Independent schools, despite being eligible to join the STARS campaign, are not subject to borough influence and can be difficult to target with such schemes. However, independent schools should be targeted as evidence suggest that parents here are far more likely to drive to school. They also have larger catchment areas so the drive is often likely to be longer.	Active engagement should be encouraged with independent schools. If students are seen to have a longer commute to school the targeting of measures should be tailored to account for this.
Once accredited, schools may find it difficult to maintain activities to keep promoting sustainable travel with each new cohort of students.	Activities and events should become continuous/regular/embedded to ensure that the rate of sustainable transport remains at levels achieved at accreditation.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Weeks/Months	**2**	**2**	**4 High**

Public Health and Awareness Raising	Return to main table

14. Air quality in and around schools, and extending schools audits to all polluted schools (and potentially to other vulnerable groups, such as nurseries)

Proposal 4.1.1b of the LES states that the Mayor will aim to do more to protect London's schoolchildren by reducing their exposure to poor air quality.

One of the programmes delivered to support this is the schools audit programme to identify measures to reduce pollution in and around 50 of London's most polluted schools. London boroughs can then rollout recommendations from the audits using funding from TfL's Local Implementation Plan (LIP) stream, and other sources.

Schools not directly audited can carry out their own audits using guidance provided by the Mayor and support from the TfL STARs programme. This approach can also be rolled out to nurseries, hospitals and other vulnerable groups.

Schools are largely autonomous from Local uthority control. However, Local Authorities have an important role to play in supporting the implementation of the recommendations from the audit programme, providing match funding and/or support, and helping the GLA to disseminate the toolkit widely to other polluted schools.

Boroughs are encouraged to:

- Use part of the £1bn funding made available through TfL for LIPs to deliver the recommendations from the school's audit programme, and to support schools with behaviour change interventions.
- Deliver smaller scale audits, engagement and improvements at all other schools in areas exceeding legal pollution limits, using the toolkit and guidance provided by the GLA and TfL.

Examples	Benefits
Lambeth Anti Idling Initiative – The project set out to find out why vehicle drivers including parents/guardians collecting children from school idle their vehicles. It included surveys and idling vehicle counts. Hundreds of drivers were engaged to ask them to switch off their engines. The project was backed with funding from the Mayor's Air Quality Fund (MAQF).	Although time consuming, direct conversations with drivers are a very effective way to explain why switching off is important. Idling is often a serious issue around school gates, creating little hotspots at school start and end times. That means targeting this behaviour can reduce students' exposure.
Hackney School Streets – In this pilot scheme, the roads outside schools are closed to traffic at opening and closing times. Closing the street to school traffic and through traffic helps to make a safer, more pleasant environment for everyone. At the same time, it ensures residents, businesses, pedestrians and cyclists can still use the road.	The road should be visibly calmer, safer and cleaner during these times. This project targets emissions, exposure and safety, and it is also a great way of raising awareness.

The Camden Neighbourhood of the Future scheme is looking at how to boost ULEV adoption in school areas. Their project is called the "School Low Emission Neighbourhood" (SLEN) The project is looking to implement timed ULEV-only traffic restrictions on streets that are congested during school run hours; looking at feasibility of ULEV deliveries to schools; and looking to boost charging infrastructure provision in schools and to parents of students.	The project is in the early stages (only began in March 2018) but includes some innovative measures which could reduce traffic and exposure and encourage a switch away from fossil fueled vehicles.

General benefits	Exposure to high levels of pollution in childhood can have serious lifelong health and cognitive impacts. As such, any improvement centred around this demographic is significant.
Emissions benefits	Taking cleaner routes to school can dramatically reduce exposure, several recent exposure studies suggest that switching from main roads to quiet back streets can reduce exposure by up to 50 percent.
Measuring success	Measures of success: • Key audit recommendations delivered at all audited schools within the borough. • All other schools (and some key vulnerable receptors) in areas exceeding EU limits to be supported to deliver their own audits using guidance provided.

Risks/barriers	**Possible mitigations**
Difficulty engaging with schools/other organisations	Starting with the audited schools will assist, as they are already engaged on air quality. Offering to provide support with the audit process will also help to engage other schools and organisations, although this requires significant staff resource
Funding for projects	LIP funding could be accessed, and this could also be a project for which S106 funding is obtained.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Medium	Weeks/ Months/ Years	**2**	**2**	**4** **Key Selected Measure**

Delivery Servicing and Freight	Return to main table

15. Update of Procurement policies to reduce pollution from logistics and servicing

Boroughs carry out a number of high value procurements, and so have a role to play in addressing emissions from vehicles used in the delivery of products/services they procure. Boroughs should:

- Review and update procurement policies to ensure that rigorous standards are applied to relevant contracts. The GLA has updated its Responsible Procurement Policy, a strategic document setting out the GLA Group's plans, ambitions and commitments for pioneering socially, environmentally and economically sustainable procurement to deliver improved quality of life and better value for money. Boroughs are encouraged to align their procurement policies with the GLA group responsible procurement policy.
- Identify opportunities for reducing emissions that contribute to climate change and poor air quality associated with purchases of products, works and services. This includes sourcing of low carbon energy wherever possible and phasing out the use of fossil fuels from your fleet, prioritizing phase-out of diesel, and transitioning to zero or ultra-low emission vehicles.
- Ensure that vehicle requirements are mainstreamed into all contracts and procurement processes, including both the purchase of fleet as well as 'last mile' deliveries. Sustainability requirements could include vehicle emission standards and requirements to preferentially score bidders based on sustainability criteria.
- Ensure that Non-Road Mobile Machinery (NRMM) procured by the local authority is required to comply with the NRMM Low Emission Zone standards from 2019 and aims to be zero emission by 2040.
- Record details of contracts that include air quality requirement.
- Assess existing contracts to evaluate what the opportunities are for reducing and consolidating deliveries (could some products be delivered less often, for example?). Simple assessments such as this can result in significant savings.
- Consider the inclusion of a requirement for contractors with fleet to be members FORS. FORS is a voluntary accreditation scheme that promotes best practise for commercial vehicle operators. It encompasses all aspects of safety, fuel efficiency, economical operations and vehicle emissions. Whilst not specific to air quality emissions reduction, FORS will help to minimise fleet environmental impact through vehicle efficiency.

Examples	Benefits
The City of London Corporation implemented the City Procurement Strategy 2015-2018 to use their buying power and collaborative relationships to drive fundamental change promoting innovation, optimise resource use and improve the lives of those involved in supply chains. The policy ensured any service or works leads to reliable outputs and responsible outcomes. Suppliers such as Skanska Construction, JB Riney & Co and Office Depot were chosen via the responsible procurement policy.	Enables sustainability – including air quality - to be a key consideration in all procurements.

Low Emissions Logistics Feasibility Study - Using funds obtained through the Mayor's Air Quality Fund a partnership between Lambeth, Southwark, Wandsworth and Croydon have carried out a feasibility study to consider the impacts of consolidating deliveries through soft measures such as reduced frequency and sharing of suppliers. Additionally, they investigated setting up a consolidation centre for use by boroughs and local businesses, but the option was discounted for now.	The study found that most procurement functions have been decentralised in the partner boroughs which can result in departments placing multiple orders to multiple suppliers thus increasing the number of deliveries made to each building. They made large reductions in deliveries simply by assessing current delivery schedules and consolidating some deliveries and reducing the frequency of others.

General benefits	• Procurement policies which favour the use of sustainability could also act as a catalyst to change the market, by prioritising companies who incorporate sustainable measures. • The FORS scheme is becoming a nationwide benchmark providing a minimum standard for fleet operators. The Driver and Vehicle Standards Agency (DVSA) Earned Recognition which is also going to have an impact for smaller vehicles.
Emissions benefits	The Low Emissions Logistics Feasibility Study considered emissions reductions which could be achieved using the efficient deliveries hierarchy to reduce the number of deliveries required by the four local authorities. Monthly NO_x emissions were predicted to reduce from around 54kg to around 7kg assuming the deliveries were made using Euro V vehicles.
Measuring success	Measures of success could include: • Rigorous vehicle standards included within procurement policies. • Number of contracts with air quality requirements included. • Number of 'last mile' deliveries to borough premises that are ultra-low or zero emission. • Number of Non-Road Mobile Machinery procured by the local authority that are zero emission or at least compliant with the NRMM Low Emission Zone standards.

Risks/barriers	**Possible mitigations**
Key internal stakeholders on the procurement side needed as a driving force.	Senior-level backing is required to drive improvements.
Can be challenging to enforce/monitor.	Ensuring air quality specifications are included within contacts can help with this, and if KPIs related to air quality can be included that will really help with monitoring.
FORS can create a barrier for companies wishing to bid for contracts, especially smaller companies.	Can be mitigated by providing a progression scale. For example, requiring they meet FORS Bronze within 90 days and Silver within 180 days of being awarded the contract.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Months/Years	**2**	**3**	**6 Medium**

Delivery Servicing and Freight	Return to main table

16. Reducing emissions from deliveries to local businesses and residents

The LES shows that almost all of London's freight is carried by road using diesel vehicles. Freight activity accounts for around a fifth of motor traffic in London. During the morning peak in central London this increases, so freight accounts for around a third of the total traffic. Proposal 4.2.1.e of the LES aims to reduce emissions from freight by encouraging a switch to lower emission vehicles, adopting smarter practices and reducing freight movements by better use of consolidated trips.

Policy T7 of The London Plan relates to freight and servicing. Part E outlines that development proposals for new consolidation and distribution facilities should be supported provided they:

- Deliver mode shift from road to rail or water without adversely impacting passenger services (existing or planned) and without generating significant increases in street-based movements
- Reduce traffic volumes within London
- Reduce emissions from freight and servicing trips
- Enable sustainable last-mile movements, including by cycle and electric vehicle

To support the reduction of delivery emissions boroughs could:

- Consider the use of incentives and disincentives to encourage cleaner vehicles and consolidated deliveries, such as EV-only loading bays, ULEV only areas and Virtual Loading Bays.
- Work with BIDs and business groups to encourage local consolidation and last mile deliveries.
- Use the TfL retiming deliveries guidance on re-timing deliveries to assess application and benefit.
- Deliver campaigns with residents to raise awareness of the impact of home deliveries and reduce missed deliveries. This could include installing infrastructure, such as parcel lockers near stations, which are being put in as part of the Archway Business Low Emission Neighbourhood.

Examples	Benefits
In March 2016, **Waltham Forest Council** secured funding from the Mayor's Air Quality Fund (MAQF) to set up a zero emission delivery scheme, using cargo bikes and electric vehicles. The project is now successfully delivering thousands of parcels to local people and businesses.	Encourages people to shop locally without a car. Very visible scheme with electric van and cargo bikes on the streets – raises awareness. Reduces emissions from deliveries and from personal car use.
Retailers on Regent Street worked with Clipper Services to make deliveries despatched from a single consolidation centre (Crown Estate Regent Street Consolidation). The centre brings together consumables from all suppliers, combining deliveries with other West End companies. This led to an 85 per cent drop in vehicle movements and consequent improvements in air quality, with 8 kg less PM emitted each year.	Key benefits of the Regent Street consolidation service include: • Deliveries when the store wants them • Less in-store storage required • Sales staff can focus on selling, instead of stock handling • Boosts companies' low emission credentials.

Virtual Loading Bays were trialled in south west London in 2017. The Kerb Virtual Parking System (VPS) was done as part of Innovate UK's £19m First of a Kind Deployment competition.	The system allowed drivers to park closely to their delivery point without causing congestion. VPS could reduce fuel through more optimised deliveries and better multi-drop planning capability. Other benefits include bookable rapid chargers in reserved bays and access to previously difficult-to-reach locations. Benefits could be enhanced if the VLBs are reserved for Ultra Low Emission Vehicles

General benefits	• Reducing vehicle movements helps alleviate congestion and improves road safety
Emissions benefits	The Regent Street project highlights that reductions in vehicle movements of 85 per cent (with commensurate emissions reductions) are possible.
Measuring success	Metrics could include: • Measured reduction in freight vehicles on inner city road network. • Consolidation/last mile delivery schemes in place. • Quantified usage and take up of schemes and interventions (such as parcel lockers). • Percentage increase in Ultra Low Emission Vehicles to undertake deliveries.

Risks/barriers	**Possible mitigations**
Difficulty in getting businesses to engage	While there are examples of successful projects, to succeed, projects need a high level of professional and targeted engagement

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low - Medium	Months/Years	**3**	**2**	**6** **Medium**

Borough Fleet Actions	Return to main table

17. Reducing emissions from council fleets

Policy 6 of the Mayor's Transport Strategy (MTS) states that the Mayor and associated organisations will seek to make London's transport network zero carbon by 2050. This will also further improve air quality. To reach this ambitious target, the GLA group, TfL and other public-sector groups must lead by example: Proposal 30 of the MTS outlines that:

The Mayor will seek to ensure that the GLA and its functional bodies lead by example in the use of ULEVs in their own vehicle fleets and will also encourage the boroughs to adopt the use of ULEVs.

Where possible, boroughs should examine the feasibility of updating their fleet with alternatively fuelled vehicles; hydrogen, electric, hybrid and bio-methane vehicles. Boroughs should also seek to re-train fleet drivers to ensure vehicles are driven in the most low-emitting and fuel-efficient manner possible. Through resources such as DriveSense, boroughs could implement Smarter Driver Training webinars and online learning modules for staff to complete remotely. The Energy Saving Trust has also produced advice on fuel efficient driving techniques.

FORS encompasses all aspects of safety, fuel efficiency, economical operations and vehicle emissions. This voluntary scheme t helps improve operators' performance in each of these areas. FORS can help boroughs lead by example adding health, safety and environmental responsibility considerations to their fleet operations.

Boroughs could:

- Join FORs and/or seek to increase the level of accreditation.
- Introduce a policy to not buy new diesel vehicles (unless no other options exist) as has been done in the City of London and Camden.
- Introduce policies and projects to ensure that only zero emission vehicles are purchased/leased, as far as is possible.
- Deliver regular driver training on eco driving/fuel efficient driving.

Examples	Benefits
TfL has developed a new seven-hour course 'Van Smart' specifically designed for van drivers. It meets the mandatory Vulnerable Road User driver training requirements of CLOCS (Construction Logistics and Community Safety), FORS Silver and TfL's WRRR (Work Related Road Risks). The course focuses on driving in urban areas and specifically safety of vulnerable road users, like cyclists and pedestrians.	• Equips drivers with the knowledge, skills and tools they need to plan and prepare themselves for driving. • Identifies road users who are vulnerable and why. • Educates van drivers with the knowledge, skills and tools they need to carry out their job diligently, safely, responsibly and with consideration for others. • Familiarises van drivers to the issues a vulnerable road user may face on public roads (on-cycle practical module).

LoCITY Driving features classroom-based and e-learning modules to help drivers and transport managers save fuel and reduce the environmental impact of commercial vehicles. 53 LoCITY Driving courses have been delivered with 577 drivers trained. 285 drivers and 89 transport managers have completed the e-learning modules.	The classroom based module is a seven-hour, CPC accredited course that focusses on reducing emissions via pre-journey planning, vehicle checks, fuel efficient driving and alternative fuels. The two online modules reinforce these topics but provide transport managers an overview of the alternative fuels available on the market.
Camden Council achieved FORs Gold for their borough's fleet (280 road vehicles and over 100 other powered machines) as part of their efforts to improve improving road safety and minimise environmental impact – see the Camden Plan.	Camden report that the process of accreditation was helpful, relatively straightforward and has helped improve efficiency, safety and environmental performance. Within the first year of rollout, CO_2 output per mile fell by over four per cent and the incident rate decreased by over 11 per cent.
The **Hackney Fleet Project** started in 2015 when Hackney Council was given MAQF funding to increase the number of ULEVs vehicles within the Council's fleet. The project will install 35 chargers, 40 bikes and over 50 EV cars and vans.	• Progressive reduction in emissions from Councils' car fleets • Leading by example
General benefits	• Supports adoption of innovative technologies, and is important in terms of leading by example • Funding is often available to support uptake of new technologies within the fleet, for example from OLEV. • Driver training can reduce risk of accidents, and can lower vehicle wear and tear and reduce fuel consumption.
Emissions benefits	FORS estimate an 11 per cent saving in fuel and emissions for scheme members. In 2015/16 Camden reported a four per cent decrease in CO_2 output per mile. Overall it is likely the eco-driving will generate fuel and associated CO_2 savings between 5 and 10 per cent (RAC Foundation 2012). Whilst CO_2 emissions should drop proportionately with fuel use, NO_x emission should decline at a greater rate due to its role as by-product of hard accelerations. However, the magnitude of NO_x savings will vary depending on the vehicle technology and type of behaviour change. Exhaust NO_x and PM emissions reductions from council fleets will be directly proportional to the progressive "greening" of the fleet, through the gradual increase in the proportion of ULEVs in the overall fleet. As an example, the **City of London Air Quality Strategy Plan** states that, since 2008, NO_x and PM_{10} emissions from the council's fleet have reduced by 40 and 50 per cent respectively.
Measuring success	• Percentage of local authority drivers who have undertaken 'smart' driver training; • Boroughs getting FORS accreditation and to what level. • Percentage of cleaner vehicles in the fleet

Risks/barriers	Possible mitigations
Lack of recharging/refuelling infrastructure	Electric vehicle charge points can be installed for a relatively low cost, and funding may be available (such as from OLEV).
Capital costs of ULEV can be higher	Boroughs can work with leasing companies to gain value for money for cleaner commercial vehicles, and funding may be available to assist (such as from OLEV). Electric vehicles are also cheaper to run so the higher capital costs could be negated.

Cost to borough	Timescale for Impact	Ease of Delivery	Scale of Benefits	Priority Level
Medium	Months/Years	**2**	**2**	**4** **High and selected**

Localised Solution	Return to main table

18. Green infrastructure (GI)

As part of urban infrastructure, GI influences pollution dispersal and deposition. GI interacts with pollution formation and removal at regional and local scales. If designed properly, GI can help to mitigate poor air quality on a local-scale. It should be noted however that GI can never remove all the pollutants from air. It also becomes less and less efficient the further away it is from sources of pollution. The Trees and Design Action group advises that:

- Trees and other GI influence wind flow. The combination of parklands, buildings, trees, and gardens creates a rough surface of different heights creating turbulence that increases mixing, and pollutant dispersion.
- Dense avenues of trees can trap air in narrow, enclosed streets ('street canyons') limiting mixing. If the pollution source is located inside the canyon this causes fumigation. If the source is located outside of the canyon this prevents mixing into the canyon, creating locally cleaner air.
- GI, such as hedges, can be used as a barrier to increase the pathway between pollution source and receptor, which increases mixing and reduces pollutant concentration.
- In comparison to similarly sized grey infrastructure, GI has a far greater surface area for pollutant deposition and thereby removes more PM, NO2, and O3 from the ambient air than bare surface.

Policy G1 of the draft London Plan relates to green infrastructure advising that:

- London's network of green and open spaces, and green features in the built environment such as green roofs and street trees, should be protected, planned, designed and managed as integrated features of green infrastructure.
- Boroughs should prepare green infrastructure strategies that integrate objectives relating to open space provision, biodiversity conservation, flood management, health and wellbeing, sport and recreation.

To help meet his manifesto commitment to make London at least 50 per cent green by 2050, the Mayor will review and update existing Supplementary Planning Guidance on the All London Green Grid. This will provide guidance on the strategic green infrastructure network and the preparation of green infrastructure strategies.

Boroughs could:

- Conduct a green and open space needs assessment to inform their green infrastructure strategy (drawing from existing strategies such as play, trees and playing pitches) (Policy G4 draft London Plan.)
- Become familiar with the details of chapter 8 (Green Infrastructure and Natural Environment) of the draft London Plan and the policies related to GI.
- Become familiar with the Healthy Streets approach and how GI also be used in public realm design to create greener walking and cycling routes to encourage active travel options away from the most polluted streets.
- Assess the greening opportunities in pollution hotspots and Focus Areas and seek funding to deliver this, in addition to greening and improving clean air routes away from busy roads.

There is funding available to support green infrastructure, such as the Community Tree Planting and Green Space Grants which can help support projects to plant trees and improve green spaces, including school playgrounds. www.london.gov.uk/greener-city

Examples	Benefits
Kensington and Chelsea – GI improvements and Green Wall Evaluation. This project introduced green screens to a roadside location near the West Cross route and Westway next to a multi-use games pitch. The aim was to reduce the pollution exposure of people (including schools and schoolchildren) using the games area. The project also assessed the green screen at St Cuthbert and St Matthias School through the Mayor's School Clean Air Zones Programme. It found a "marked reduction" in pollution on the school playground side of the screen, and helped inform the design of the new green wall on the Westway.	Exposure reduction Improved street scene
Redbridge - Cleaner Greener Schools, using funding from the MAQF a project was undertaken to provide 170m2 of green wall. The green walls were installed at three primary schools in the borough alongside the planting of 37 trees. The green wall project was implemented alongside a drive to increase the number of students coming to school by walking or cycling, to maximise the benefits.	Exposure reduction Improved street scene

Benefits	Green infrastructure schemes can transform urban areas and help improve public spaces. However, it can be hard to quantify their effectiveness in terms of reducing emissions.
Measuring success	Success could be measured through: • Keeping a record of GI projects implemented by the council as far as is possible • Monitoring of the impact of projects would also be helpful – concentration monitoring and the use of other indicators such as increases in walking and cycling.

Risks/barriers	Possible mitigations
Maintenance of green infrastructure is essential to maximise its benefits	Financed maintenance plans need to be in place before installation. Sometimes, local community groups may be able to help, but this requires oversight and management
Responsibility for green space sits primarily with parks. As such, it may not be prioritised as an air quality issue and resource-issues may limit joint working.	Good communication between teams
The correct choice of species and location is very important to maximise air quality benefits.	Consideration should be given to species and location early in the project using advice from the Trees and Design Action group.

Cost to borough	Timescale for Impact	Ease of Delivery	Scale of Benefits	Priority Level
Medium	Weeks/Months	**2**	**3**	**6 Medium**

Localised Solution	Return to main table

19. Low Emission Neighbourhoods (LENs)

A Low Emission Neighbourhood (LEN) is an area-based scheme. It includes a package of measures in a pollution hotspot designed to reduce emissions and visibly improve the pedestrian and cyclist environment. London boroughs and BIDs are delivering 11 LENs and Business LENs funded with £6m from the Mayor.

LENs have the following objectives:

- Reduce emissions, leading to improved air quality and climate change mitigation, and reduced negative impact on health.
- Increase human physical activity and health, through encouragement of more walking and cycling.
- Reduce road traffic casualties through overall reduction in vehicle kilometres and alterations to traffic management.
- More efficient use of limited road space, urban regeneration and improved local economy.

When thinking about a LEN, boroughs should consider the following factors as important for success:

- Transformational - LENs must be visibly transformative with sufficient investment in designing and implementing measures. They must include funding for urban realm improvements, enabled by a reduction in motor vehicle dominance.
- Evidence Based - Measures must be designed on a detailed understanding of how an area currently operates. This includes the land use, ownership and governance, delivery and servicing activity and travel behaviour.
- Effective - There must be a measurable impact on emissions using the best available evidence in assessment of their impact.
- Acceptable - The need for bold measures must be understood and supported by the local community so that tangible improvements in air quality can be realised and additional private sector investment can be attracted.

Finally, running through the above four principles is the need for community buy-in. For a LEN to work, effort is required by everyone and the LENs' transformative nature is intended to foster a sense of pride in those involved and be a significant 'prize' to be gained from the effort to make a LEN work.

Boroughs could conduct scoping studies that consider which areas are suitable for a LEN and what initiatives would be suitable in that area. Lambeth, for example, have undertaken several such studies, to be prepared if any new funding becomes available either from within the council or externally.

Examples

Borough LENs are being delivered in five places, and are due to be completed in April 2019.

Barbican (City of London)

- A pop up air quality garden, a new low emission route, delivery and servicing improvements to local businesses, a grant award scheme for local businesses, and regular compliance checks on all construction sites, a ULEV street
- Cycling Pop Up Events – Events to promote cycling includes cycle repair workshop and safety checks, free cycle training, security marking of cycles and information about cargo bike hire scheme.

City Fringe (Shoreditch) (Hackney, Islington and Tower Hamlets)

- The creation of a new public square, installation of lamppost and rapid chargers, and a host of other urban realm improvements including greened "gateways" to the LEN
- Ultra Low Emission Streets – Creation of two time-restricted pedestrian, cycle and ultra-low emission vehicle (ULEV) zones.

Greenwich Town Centre (Greenwich)

- E-Bike Trial – residents have can trial an e-bike for four weeks for just £10.
- A host of walking and cycling and urban realm improvements along Trafalgar Road, to reduce car dominance.
- Better Points App – Rewards residents with gift vouchers for walking and cycling through a smart phone application.

Ilford Garden Junction (Newham and Redbridge)

- Inspiration is taken from the adjacent River Rodding for a 'ripple' design to green and clean this very imposing cycling and pedestrian unfriendly area, with trees and shrubs. Improved routes for pedestrians and cyclists and feature lighting under and along the flyovers.

Marylebone (Westminster)

- Hospital anti-idling programme - To reduce idling at local hospitals, a video has been developed for ambulance and taxi drivers to encourage them to switch-off their engines when stationary.
- Electric Vehicle Charging points - There are now 24 EV charging points in the LEN. Fifteen of these have recently been installed in lamp columns as part of a new initiative being piloted in the LEN.
- A diesel surcharge on metred parking in the LEN.
- Energy efficiency programmes

There are also six smaller scale Business LENs being delivered in partnership with local business groups. Business LENs are business/organization-focused Low Emission Neighbourhoods. The six projects are: Borough High Street, Hammersmith, Aldwych, Homerton, Archway, and Euston.

General benefits	• Significant emissions benefits in introducing measures as a package. • Community engagement (individuals and/or business community), as LENs are rolled out in partnership with local community. • Increased human physical activity and health, through encouragement of more walking and cycling. • Reduced road traffic casualties through overall reduction in vehicle kilometres and alterations to traffic management. • More efficient use of limited road space, urban regeneration and improved local economy.
Emissions benefits	In combining measures locally cumulative reductions will be achieved, which should will be measurable, monitoring and assessment of current LENs will be published in 2019.
Measuring success	• LENs to be completed by April 2019, and a quantifiable reduction in pollutant emissions in most of the borough LENs is anticipated. • A further indicator of success for other boroughs is development of outline ideas/plans for their own LENs in pollution hotspots.

Risks/barriers	**Possible mitigations**
Impact of LENs may be diluted by cherry picking the easiest measures.	Encourage different approaches to emissions reduction so different techniques are trialled.
LENs rely on borough and community involvement.	Make use of social media and community engagement events such as pop up cycle events Engage with local businesses.
Longer timeframes for delivery and higher delivery risks.	Plan events at regularly spaced intervals to maintain project momentum. Report milestones on social media to maintain community engagement.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Medium/High	Months/Years	**4**	**1**	**4** **High**

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20. Ensuring that Transport and Air Quality policies and projects are integrated

It is well documented that road traffic emissions are one of the main sources of air pollution in London. It is therefore vital that there is effective communication between those managing air quality issues with boroughs and those managing traffic and travel.

Boroughs should ensure that internal transport teams are fully aware of the air quality issues affecting London, and that formal regular communication channels are in place.

Effective communication between teams could be achieved several ways, including:

- Heads of Transport should sign off AQAPs and review them annually.
- Air quality risks should be fully evaluated in all transport feasibility studies and proposals.
- Provision of regular briefings to the Transport Team on local air quality issues and projects, and the location of hotspots/Focus Areas.
- Making a requirement for an air quality official to attend transport steering groups, and vice versa.
- Incorporating quality based targets within specific Transport job roles, ensuring accountability and delivery.

Examples	Benefits
"Bank on Safety" timed restrictions for vehicles was introduced primarily as a road safety scheme, to reduce collisions with cyclists and pedestrians. The junction is closed to all but buses and cycles between 7am and 7pm on week days.	As well as improving safety, initial monitoring suggests that NO2 levels have reduced by around 25%
Camden West End Project: The West End Project is transforming Tottenham Court Road and its surrounding areas in preparation for the opening of a new Crossrail station. New public and green spaces are being created while new street layouts will reduce traffic and pollution, making bus routes faster and cycling safer. The project involves several changes to local traffic infrastructure. These include removing the current one-way system and replacing it with two-way streets, upgraded signalised junctions, protected cycle lanes and widened footpaths.	Improved walking and cycling environment, enhanced commercial environment, and reduced air pollution.

General benefits	Ensures that the sometimes conflicting priorities of air quality and transport are considered and maximises co-benefits from projects and schemes.
Emissions benefits	Joint transport and air quality schemes such as the Camden West End Project Additionally, total traffic related annual CO2 emissions from all modelled sources were predicted to be three per cent lower with the scheme in place.

Measuring success	• Regular meetings and formal processes in place to ensure effective communication. • Transport inputting into AQAPs and AQ inputting on all major transport projects. • Delivery of ambitious Transport projects which support Healthy Streets, walking and cycling and improved air quality outcomes.

Risks/barriers	**Possible mitigations**
Conflicting priorities and heavy workloads of transport and air quality departments could act as a barrier for communication and collaboration.	Put in place robust efficient communication channels and processes.
Transport teams may not feel they have enough knowledge of the air quality issues facing London to be able to make informed decisions.	Ensure support is present from air quality officers and provide details of air quality tools and support available such as the Local Air Quality Management (LAQM) Helpdesk.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Weeks/Months	**1**	**1**	**1** **High**

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21. Discouraging vehicle idling

Rule 123 of the Highway Code states drivers must not leave a parked vehicle unattended with the engine running or leave a vehicle engine running unnecessarily while it is stationary on a public road. Local authorities therefore have the power to issue £20 fixed penalties for emission offences and stationary idling under The Road Traffic (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002.

While hard to police these regulations in all locations it is possible to identify areas where groups of vehicles are currently idling to aid targeted action.

Councils may also consider introducing 'no vehicle idling' areas, particularly where groups of vehicles congregate (such as outside schools, hospitals and care homes) and in areas where exposure to road-traffic-related air pollution is high.

To discourage unnecessary idling, boroughs could consider:

- Engaging civil enforcement officers to enforce against idling (this should be preceded by a press release and awareness campaign).
- Using road signs to inform drivers about no-idling/no-idling zones.
- Supporting school and community no idling campaigns.

Examples	Benefits
The City of London carried out a three month publicity campaign. This aimed to educate people about its plans to issue fixed penalty notices (FPNs) to drivers who do not turn off their engines once asked to do so by an authorised officer. Police Community Support Officers (PCSOs) identified hotspots for idling. A highly focused approach was taken, targeting businesses and coach and delivery companies and construction and demolition sites.	The project found that drivers turned off engines when asked and there was no need to issue FPNs. The number of reports of idling vehicles reduced as a result and the project was considered a success. Civil Enforcement Officers will speak to drivers with engines left running and signs are put up in hotspot areas.
As part of the **Marylebone Low Emission Neighbourhood (LEN)** an anti-idling campaign was conducted to reduce idling outside local hospitals. The campaign targeted ambulance and taxi drivers to encourage them to switch-off their engines when stationary. The project included a video to show ambulance fleet drivers the negative impacts that their engine idling can have. The video is used as a toolbox talk that can be shown to hospital visitors. In addition to this, Westminster used a local order to increase the idling fine from £20 to £80, and hired on-street Marshalls to enforce this.	The video is very effective as it addressed the common reasons drivers may give for not switching their engines off and explains why not idling is still the best solution. The increased fine and use of Marshalls has also been very effective in raising awareness and garnered significant press attention.

Vehicle Idling Action – is a MAQF funded behaviour change campaign which is helping to reduce localised air pollution caused by motorists who leave their engines running when parked. The campaign is supported by 16 local authorities with teams of volunteers, local authority and project staff working to educate both motorists and pedestrians. The website provides toolkits for volunteers at schools, hospitals and local authorities to organise their own anti idling events.	King's College London produced a report for Vehicle Idling Action in 2016. The study found that at some locations the study showed a 20-30 per cent reduction in peak concentrations by the kerb on action days compared to non-action days.

General benefits	It's an easy action for people to take to reduce completely unnecessary emissions
Emissions benefits	A small-scale study by King's College suggested that concerted idling action campaigns could reduce local concentrations very close to the source of idling vehicles by 20-30 per cent.
Measuring success	• Number of FPNs issued for vehicle idling. • Where marketing campaigns are undertaken the effects of these could be tracked, the number of hospitals displaying anti-idling videos for example. • Monitoring along the lines of the Kings Idling Action Days study could be considered.

Risks/barriers	**Possible mitigations**
Idling is a minor contributor to pollution. There is a danger of it being a distraction from more meaningful activity, with people feeling that no-idling is all they need to do.	Ensure the bigger picture is also communicated.
Drivers could be concerned that repeated turning engine off and on could cause damage to the vehicle.	Advise that ignition in modern cars has eliminated this problem.
Restrictive measures could be met with public opposition if not delivered effectively alongside visible marketing campaigns.	Make use of marketing such as the Marylebone LEN video to raise public awareness.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Months/Years	**1**	**3**	**3 High**

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22. Regular temporary Car Free Days and pedestrianisation schemes

The final paragraph of proposal 4.2.1a of the London Environment Strategy highlights the importance of car free days and areas for transitioning to Healthy Streets and promoting mode shift. It states: More car-free days in central London, town centres, high streets and other locations would enable people to experience their local area from a different perspective, help enhance local communities, and result in local improvements in air quality.

A range of different road closure measures have been trialled or adopted within London, ranging from annual events which close a road for a day each year to closures for short periods during the week near to schools. In addition, boroughs could also consider permanent traffic restrictions on certain roads or junctions as part of the Healthy Streets Approach. However, traffic displacement should be carefully considered for all schemes.

Boroughs could:

- Deliver regular temporary road closures in high footfall/iconic areas.
- Consider regular temporary road closures around particularly sensitive receptors such as schools and hospitals.
- Use temporary road closures events to trial and/ or test design of permanent schemes that prioritize walking, cycling and use public transport.
- Support local communities to organise events that celebrate different uses of streets and help people to reimagine how street space could be used if traffic free.
- Where temporary road closures occur, engage businesses so they see the road closure as an opportunity rather than a threat.

Examples	Benefits
School Streets Hackney – This pilot scheme sees the roads outside schools closed to traffic at the schools' opening and closing times. Closing the street to school traffic and through traffic helps to make a safer, more pleasant environment for everyone while ensuring residents, businesses, and people walking and cycling can still use the street.	Streets should be visibly calmer, safer and cleaner during these times. The borough also intends to collect data on how parents and pupils travel to school, along with data relating to traffic flow and local air quality concentrations.
As part of the Low Emission Neighbourhood (LEN), parts of Shoreditch Celebrated Car Free Day in September. The day included pop up parklets, where several parking spaces were turned into pocket parks. There was also a garden party was held on Garden Walk, where a normally busy street was closed to vehicles for the day.	As well as reducing emissions, hosting a community event as part of the LEN means the Car Free Day can be viewed in a larger context by locals.
Regent Street, London: Summer Streets is an annual event on Regent Street, where thousands take part in one of the biggest traffic-free events of the summer. It's a chance to celebrate culture and connecting communities whilst reclaiming the high street for people. The event includes live music, workshops for children, activities promoting the environment and food and drink stalls on a traffic-free street for four Sundays in July.	Promotes the area and highlights the benefits of streets without cars.

General benefits	• Provides temporary reductions in reductions in exposure to emissions. • Can potentially lead to longer term behavioural changes and be used to test more permanent traffic management changes. • Likely to trigger interest from residents, schools, and community organisations in active travel and move to zero emissions and zero carbon city. • Tried and tested in various cities around the world on a smaller scale. However, the make up of London's streets means that some of the action days will need to be tailored to minimise effects on business and residents. • Can provide people with a safe environment in which to develop/learn cycling skills, and provides support for encouraging active travel.
Emissions benefits	Where road traffic sources make up the main source of pollutant concentrations, temporary road closures will provide a big temporary improvement to air quality. For example, the road closures for the London Marathon in 2018, resulted in a reduced No2 concentration on Upper Thames Street of approximately 89 per cent. Research by King's College in 2013 found that the Summer Streets event in Regent Street resulted in a 75 per cent drop in NO_2 concentrations.
Measuring success	How to measure success: • Organised temporary road closures undertaken by community groups as tracked through local authority records. • Concentration monitoring of the impact of road closures could be undertaken. • Increases in walking and cycling after road closure events.

Risks/barriers	**Possible mitigations**
May lead to displacement of traffic and emissions instead of overall reduction, causing pressure on other road networks.	Encourage attendees of Car Free events to travel to the event using low emission transport, and ensure adequate engagement and communication is undertaken to encourage all drivers to avoid non-essential car journeys on event days
Potential disruption to local business	Engage with businesses before the event. Encourage local business to take part so it becomes an opportunity rather than a threat.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Weeks/Months	**3**	**1**	**3** **High and selected**

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23. Using parking policy to reduce pollution emissions *(TBC - For discussion with/feedback from boroughs)*

Proposal 4.2.1d of the LES states that the Mayor aims to reduce emissions from private and commercial vehicles by phasing out and restricting the use of fossil fuels, prioritising action on diesel. The detail of the proposal relates not only to charges for the use of highly polluting vehicles in certain areas but also explores the potential for parking policy to incentivise the parking of cleaner vehicles in problem areas. Specific example considered in the LES include:

- Exploring borough-level restrictions on fossil-fuelled vehicles, prioritising diesel vehicles (for example diesel surcharges on resident parking permits), and parking initiatives to encourage Ultra Low Emission Vehicles (ULEVs)

Parking is a key lever at boroughs' disposal and bold measures could have a real impact on car use. Boroughs should therefore consider how best to use parking policy to promote modal shift and incentivise cleaner vehicles. This could include:

- Implementing new parking incentives for EVs and disincentives for diesel, and/or strengthening existing incentives, on residential, business and metered parking.
- Implementing Workplace Parking Levies where possible to encourage modal shift through demand management mechanisms, long-term reduction in parking supply and revenue for local transport improvements.
- Supporting the reduction of parking wherever possible, including for the delivery of pocket parks, as part of the Healthy Streets Approach.

Examples	Benefits
Westminster is trialling emissions-based charging for diesel vehicles parking within the Marylebone LEN. A 50 per cent surcharge applies to pre-2015 diesel vehicles paying to park in Marylebone, Hyde Park and Fitzrovia. The hourly charge for pre-2015 diesel vehicles is £7.35. All other vehicles are charged at £4.90 per hour. This has been undertaken at the same time as the borough undertaking an expansion of the on-street electric charging provision.	The surcharge should encourage a shift to cleaner vehicles. By encouraging electric vehicles, the borough is also promoting a solution.
Islington council has a £99.65 surcharge on resident's parking permits and a £2 per hour surcharge on metered parking for diesel vehicles.	More significant surcharges such as these are likely to make a bigger impact than the smaller charges adopted by many councils. Surcharges are a practical disincentive as well as raising awareness.

General Benefits	• Provides an incentive for people to choose zero or low emission vehicles, especially in central and inner London, where metered parking is limited and costly. • Can be implemented in a relatively simple/low-cost way (by providing exemption permits). • Could have significant influence as two thirds of Londoners are required to have residential parking permits, informing future purchasing patterns of this demographic would help considerably with London's air quality issue. • Could also be used as a method to promote modal shift to cleaner healthier modes of transport.
Emissions benefits	It is hard to measure the emissions reduction from parking surcharges directly. However, it is expected that measures such as surcharges for diesel vehicles could lead to a drop in the overall number of higher polluting vehicles in London. Assuming 2016 Inner London Fleet levels a 5% shift from diesel cars to petrol cars would result in NO_x emissions reductions from cars of 7.2% and PM_{10} emissions reductions from cars of 2.3%. If a 5% shift occurred from Diesel cars to Electric Vehicles a NO_x emissions reduction from cars of 9.2% would result.
Measuring success	Suggested metrics: • Monitoring parking levels of most polluting vehicles. • Proportion of residential permits issued to both most polluting and cleanest vehicles. • Comparison of charges with other boroughs.

Risks/barriers	**Possible mitigations**
Public backlash, as may be viewed as unfair	Clearly communicating the issues and rationale.
Potential for financial risk to the council if discounts are provided for low emission vehicles and there is then a significant surge in uptake of these vehicles	Charges for low emission vehicles would need to be managed based on the proportion in use, a maximum threshold could be set

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low	Months/Years	**3**	**1**	**3 High**

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24. Installation of Ultra-low Emission Vehicle (ULEV) infrastructure (electric vehicle charging points, rapid electric vehicle charging point and hydrogen refuelling stations)

The Mayor's Transport Strategy aims for all taxis and Private Hire Vehicles to be zero-emission capable by 2033, for all buses to be zero emission by 2037, for all new road vehicles driven in London to be zero emission by 2040, and for London's entire transport system to be zero emission by 2050.

The London Environment Strategy acknowledges that to succeed in making the transition to ULEVs, we need a major expansion in electric charging and hydrogen infrastructure. This includes meeting the need for rapid charging to support zero emission capable taxis, private hire vehicles and commercial vehicles, and working with boroughs and private operators to provide on-street residential charging.

TfL and City Hall will work with boroughs and industry to understand the long-term need for residential charging. As well as standalone stations, hydrogen refuelling systems and charging infrastructure can, and should, be integrated into existing refuelling stations.

In August 2017, TfL, London Councils and the GLA announced that almost £4.5m has been allocated to London boroughs to install on street residential electric vehicle charging infrastructure as part of the government's Go Ultra Low City Scheme, with more funding being allocated to boroughs at a later date. The Mayor also runs an EV Taskforce to bring stakeholders together to accelerate the uptake of EVs.

Boroughs should:

- Allocate space for rapid, fast, and residential/lamppost chargers
- Support and advise residents who wish to install chargers, particularly those without off-street parking, and prioritise queries from taxi and private hire drivers
- Encourage car club operators to reduce fossil fuelled vehicles and replace these with electric vehicles by providing rapid charge points as well as other dedicated infrastructure
- Require private developers and landowners to install ULEV infrastructure
- Encourage sustainable last-mile schemes through the provision of rapid electric vehicle charging points for commercial/freight vehicles
- Promote the Workplace Charging Scheme funded by the governments Office for Low Emission Vehicles, which provides a grant for businesses to reduce the cost of having an EV charge point installed at their premises. The grant allows businesses, charities, and local authorities to claim £500 per socket installed, up to a maximum of 20 sockets
- Be aware of other commercial charging schemes / grants which helps businesses provide electric charging points, strengthening the network (Zero Carbon World and Go Ultra Low city Scheme)

Installation of ULEV infrastructure should be planned and delivered in such a way that does not undermine other Mayoral policies, especially in relation to active travel and Healthy Streets. EVCPs installed on pavements can sometimes introduce barriers for people walking, cycling and dwelling by cluttering the pavement and obstructing the ability to move along the pavement safely. For these reasons, and to ensure that ULEV parking is in the most suitable locations, boroughs should develop a spatial strategy for the delivery of ULEV infrastructure that takes account for the need to meet mode shift targets, encourage walking and cycling and ensure that other schemes are not precluded by ECVPs on pavements, including widened footpaths, segregated cycle lanes, pedestrianised or car free areas, etc.

Examples	Benefits
Westminster is installing charge points for residents on visitor parking bays where possible. This is proving to be very effective and minimises local resistance, although it does have an impact on council parking revenue. • When they reach a ratio of three cars to one charge point they look at installing an additional residential EV bay on a street. • They use an app-based booking system which restricts the amount of time a resident can spend in a residential EV bay to 8 hours. After this, they must move their car into a standard residential bay. This ensures other resident EV-owners can use the charging bay.	Having a policy which allows for further growth in EV charging points when a certain number of electric vehicles are registered in an area allows for continued growth of the new technology. An app based booking system allows users to see other nearby charging stations should one already be in use upon arrival.
Hammersmith has installed three rapid charge points in Scrubs Lane car park. These serve residents and commercial vehicles servicing nearby town centres. Suppliers were appointed using the London rapid charge point supplier concession framework and connections were funded by TfL.	Rapid electric vehicle charging points can charge a battery up to around 80 per cent in around 30 minutes.
Hounslow has started fitting electric vehicle charging points into lampposts as part of a three-year MAQF funded trial, allowing residents to directly charge their car from lamp columns located on the kerb side. Most electric / hybrid owners usually charge their cars overnight on a driveway. The borough therefore recognises that residents without off-street parking might be put-off buying an electric or hybrid vehicle because they don't have access to nearby charge points. By allowing residents to request charge points in lamp posts close to them the council hope to mitigate this problem.	Allows those who don't have a driveway to be able to charge an electric vehicle easily. Does not take up pavement space.
Westminster Electric Vehicle Car Clubs project was set up with funding from the Mayor's Air Quality Fund. It provides a network of dedicated electric vehicle (EV) charging and parking bays for electric car club vehicles. It installed 23 EV charging points. However most were designed to service two parking bays. This enabled up to 40 EV car club vehicles to be parked and charged.	Reduces emissions and helps raise awareness of and familiarity with EVs amongst a broader audience
General benefits	• Evidence from trials suggests that most plug-in vehicle owners want to charge their vehicles at home, at night, as this is the most convenient time. (OLEV, 2011). • However, a large proportion of Londoners are unable to park near their home and use on-street parking, lamppost on-street charging facilities enable this to be possible. • Rapid charging points help to enable longer, frequent journeys for local people without a charge point at home. It does so by enabling drivers to quickly and conveniently top-up their vehicle's charge, they are also very important for commercial vehicles and taxis.

Emissions benefits	Assuming 2016 Inner London Fleet levels, if a five per cent shift occurred from diesel cars to electric cars this would result in an emission reduction across the whole fleet of 4.2 per cent for NO_x and 1.7 per cent for PM_{10}. A 5 per cent shift to electric vehicles from both each of Diesel cars and Diesel LGVs would result in 9.9 per cent reduction in NO_x emissions and 3.7 per cent for PM_{10}.
Measuring success	Work could be tracked by: • Monitoring proportion of electric vehicles registered by residents in the borough. • Monitoring proportion of lampposts or equivalent infrastructure which have been modified to enable EV charging. • The number of rapid chargers installed.

Risks/barriers	**Possible mitigations**
Understanding demand from residents	Surveying residents to understand intentions to go electric and where demand might occur. Creating a comms channel to make it easy for residents to apply for infrastructure near their home, including priority for taxi drivers.
Identifying suitable locations for rapid charge points	Working with local business community to identify off street locations for rapid charge hubs, making use of municipal car parks and exploring opportunities as part of highway improvement schemes.

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Low (because funding is available from TfL/OLEV)	Months/Years	**2**	**1**	**2** **Key Selected Measure**

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25. Provision of infrastructure to support walking and cycling

The Healthy Streets Approach is a framework that puts people and their health at the heart of the decision making, helping everyone to use cars less and to walk, cycle and use public transport more. The two main indicators of the Healthy Streets approach are in fact that streets should be welcoming for pedestrians of all walks of life and that people choose to walk, cycle and use public transport. In relation to walking and cycling this approach states that:

Walking and cycling are the healthiest and most sustainable ways to travel, either for whole trips or as part of longer journeys on public transport. A successful transport system encourages and enables more people to walk and cycle more often. This will only happen if we improve the experience of being on our streets.

The Mayor's Transport Strategy outlines the aim that by 2041, some 80 per cent of all trips in London should be made on foot, by cycle or by using public transport. For this to be achieved there must be a significant increase in infrastructure which supports walking and cycling and makes it a more attractive, safe and convenient proposition.

Boroughs should consider the following to increase provision of infrastructure to support walking and cycling:

- Ensure that dedicated public transport, walking and cycling provision are at the heart of planning for Opportunity Areas
- Explore how existing areas could be improved through prioritisation of people walking and cycling by using a set of solutions and measures such as road closures, road layout improvements, delivery of dedicated cycle infrastructure adapted to local context and traffic volumes and speed, or by changing the priority of junctions
- Delivery of and support for cycling parking infrastructure at key destinations and trip attractors such as transport interchanges, services, retail areas, schools, workplaces, businesses and residential areas
- Promoting walking and cycling initiatives to ensure uptake, such as the Walk London Network and TfL's Cycle Hire scheme.

Examples	Benefits
Hackney has implemented a range of cycling infrastructure strategies including: • Secure residential cycle parking - installation of Cyclehoop cycle hangars on several streets to accommodate demand for secure residential cycle parking. They are half the length of a parking bay and can store up to six bicycles. • Launch of Cycle Hackney app, which aims to change the future of cycling in the borough. The app enables users to track their journeys and report issues and faults. This helps the borough to understand how and why people cycle in Hackney and why people pick some routes to cycle, while avoiding others. It will also help the borough to identify where there is need for additional cycle parking. • First digital display cycle counter in the UK at Goldsmiths Row; the data from this and four other counters is used to analyse the growth in cycling in the borough and plan future improvements to cycling infrastructure. • A host of urban realm improvements that prioritise cyclists, including a range of new cycle paths.	The borough now boasts the highest number of people cycling to work of any London borough

Richmond has devised a Council Cycling Strategy (2016-26) to increase cycling mode share from 7 per cent in 2014 to 15 per cent by 2026, alongside initiatives to encourage walking. Such measures include; developing new Richmond walking maps, launch of Walkit.com with app, Cycling and Business Engagement Project (2016) to establish pollution free desired cycling routes, cycle hub installed at Teddington Station along with 9 cycle hangers across the borough and school walking initiatives such as 'Walk to School month' and 'Walk Once a Week' supported alongside traffic management and safety projects.	Putting cycling and walking at the heart of policy can help to ensure effective delivery. Also, a different pack of physical and soft measures can support more people to walk and cycle more often.
Enfield, **Kingston** and **Waltham Forest** have been changing their streets to make them more attractive and safe for people to cycle and to walk, through the delivery of the Mini-Hollands programme, funded by TfL	Changes to road network within the borough, including dedicated cycle infrastructure provision on busy roads, redesigned junctions that are safer for people walking and cycling, filtered permeability measures that reduce motor traffic on residential streets, improvements to public realm and provision of cycle parking hubs

General benefits	• Encourages more active travel which has a positive impact on public health (reduced rates of depression, dementia and hip fractures, amongst other benefits) and can reduce dependency on cars, improving local air quality. • Better walking and cycling environments can connect communities and provide a welcoming and inclusive city for everyone. • Investing in walking and cycling infrastructure enables increased activity levels amongst local communities. This provides benefits for individual health, the NHS, and for transport as a whole. Research shows that if every Londoner walked or cycled for 20 minutes a day, it could save the NHS £1.7bn in treatment costs over the next 25 years.
Emissions benefits	It is difficult to quantify with certainty the reduction in emissions or concentration that can be achieved on specific projects through modal shift from car to active travel (walking or cycling) as this depends on many factors, including the expected reduction in car trips, the average car trip length, and assumptions on car engine technology (engine type and Euro standard) However, it is clear that reducing car use is one of very the best ways to cut both NO2 and PM emissions. **Sustainable Travel Towns** studies show that car driver distance could be reduced by five to seven per cent, which can provide large reductions in NOx/PM emissions.

Measuring success	Success measures could include: • Percentage increase in cycling • Percentage increase in walking • Cycle counter results • Length in miles of dedicated cycle paths • Number of secure cycle parking spots across the borough

Risks/barriers	**Possible mitigations**
Provision of infrastructure projects can be costly, challenging and time consuming.	Strong policy direction at a senior and political level can help to drive improvements

Cost to borough	**Timescale for Impact**	**Ease of Delivery**	**Scale of Benefits**	**Priority Level**
Medium-High	Months/Years	**4** (To deliver comprehensive improvements across the borough)	**1**	**4** **Key Selected Measure**