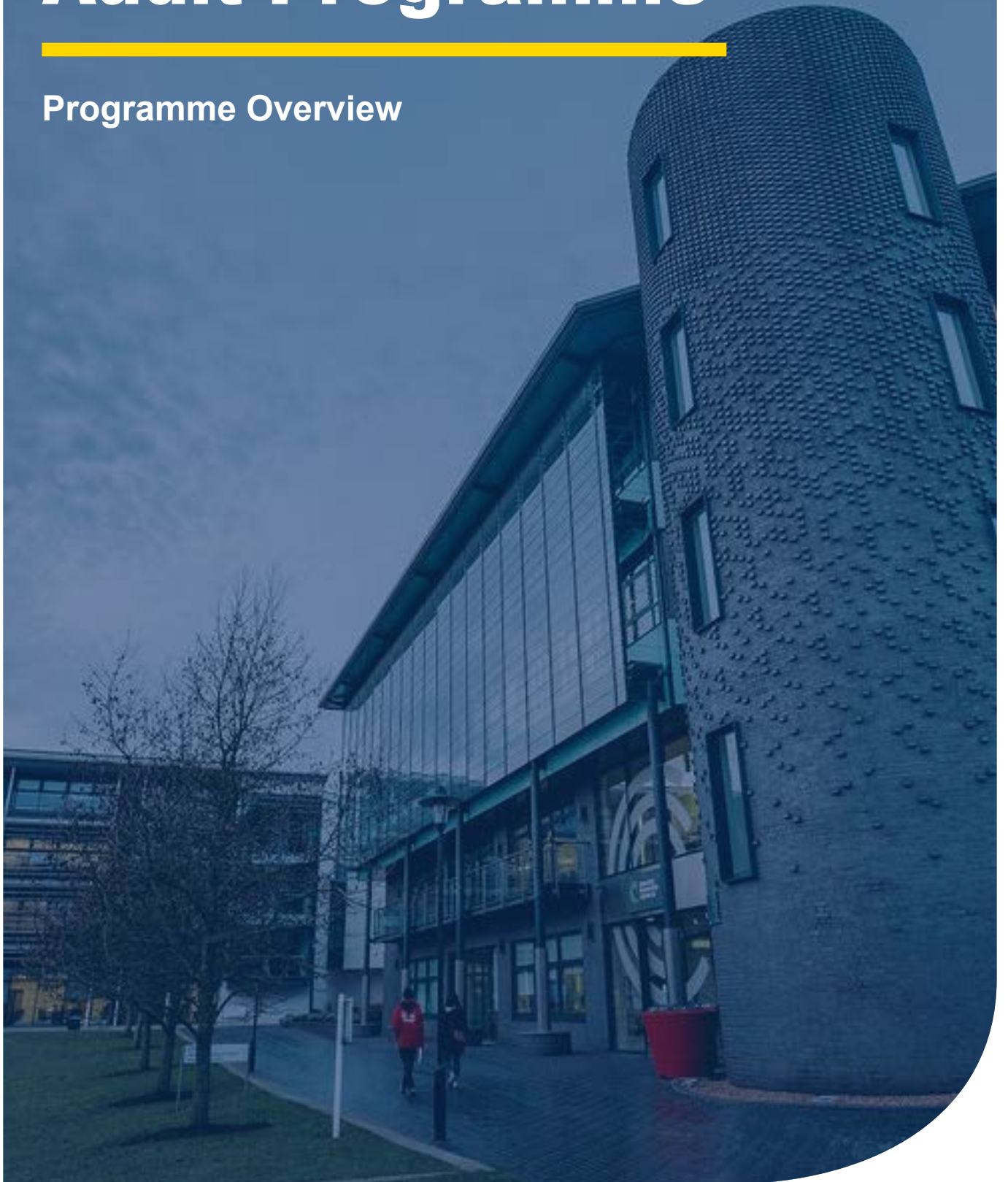


School Air Quality Audit Programme

Programme Overview





Introduction

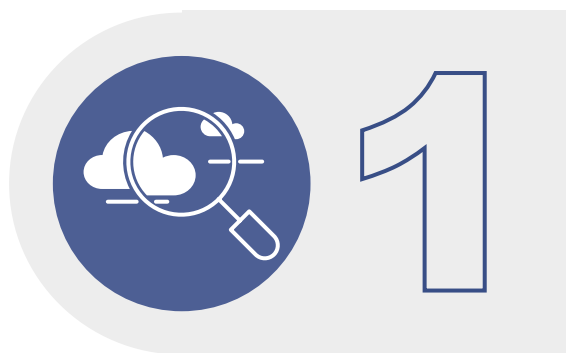
The City of Westminster is located at the heart of the capital and suffers from some of the worst pollution in the country. The Council recognises that air pollution disproportionately affects the young and reducing pollution around schools has been identified as a key priority.

The Council introduced a 'School Air Quality Programme' with support from a specialist company, WSP. The programme sought to offer every education establishment an Air Quality Audit that helps identify the sources of emissions and exposure and put forward measures to reduce the impact of air pollution on the school community.

Objectives

Whilst road transport is a major contributor to ground based emissions, accounting for 50% of NO_x emissions, the Council recognises that reducing traffic levels alone will not solve the problem.

The programme therefore took a holistic approach by seeking ways to encourage behaviour change, educating pupils about air pollution, implementing green infrastructure and making changes to the built environment.



Identify the sources of outdoor air pollution and potential exposure by school children and their surrounding catchment area.



Identify, evaluate and recommend a combination of measures across four main themes; Highways, School Buildings / Grounds, green infrastructure and Behavioural Change.

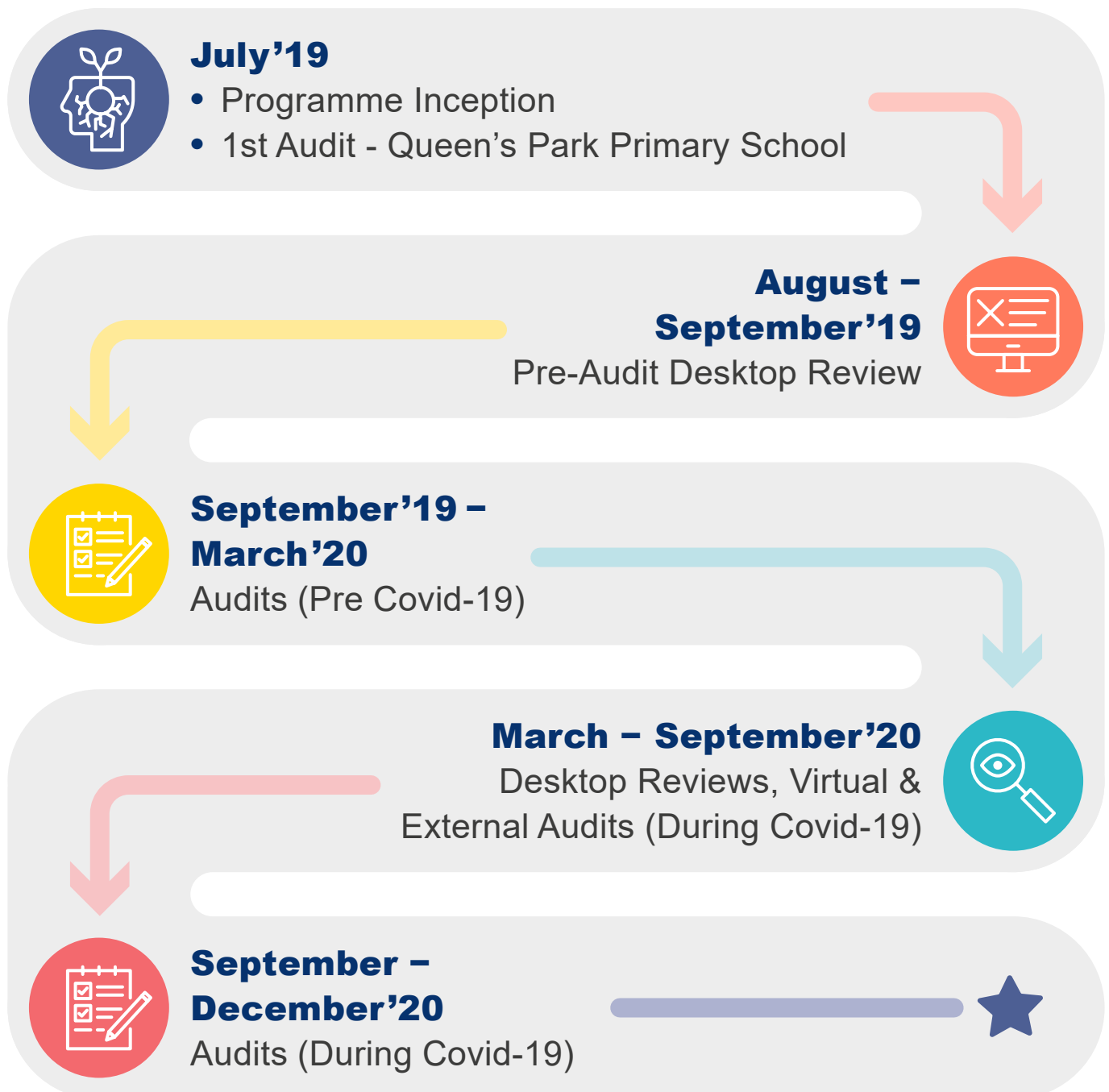


Engage school communities to educate stakeholders about the impacts of air quality.

Programme

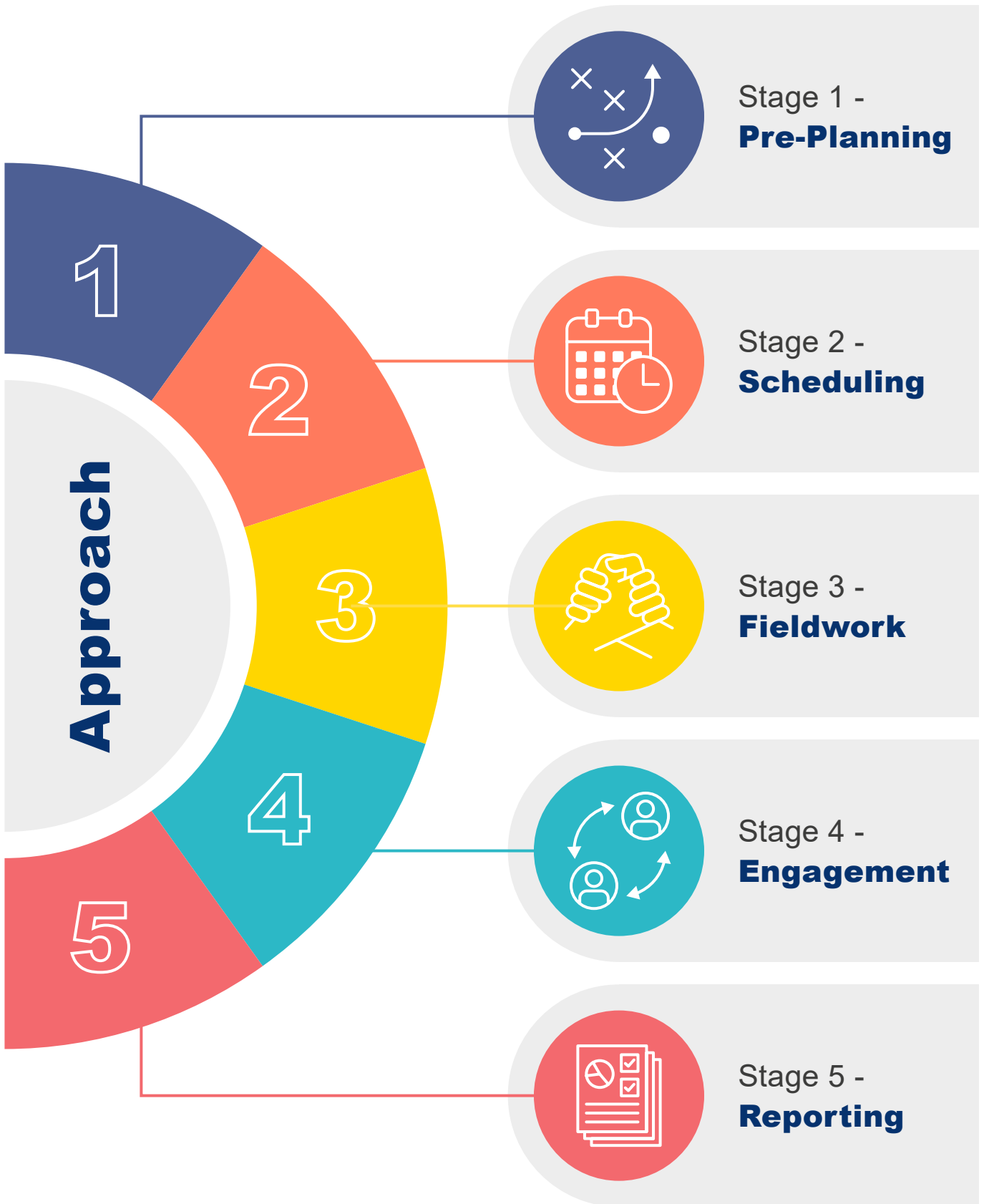
WSP were commissioned by the Council in July 2019 with a view to providing all schools identified with a school air quality audit and a report setting out key recommendations that can be considered, to help reduce both sources of emissions, as well as exposure to emissions.

Programme Delivery Timeline



Audit Approach

The audit approach for each school typically consisted of five key stages:







Audit Findings

Whilst each school audited as part of the programme had its own particular characteristics that is reported in each school specific report, it is possible to summarise some of the key findings at a borough level.

Overleaf, a summary of the following topics are provided:

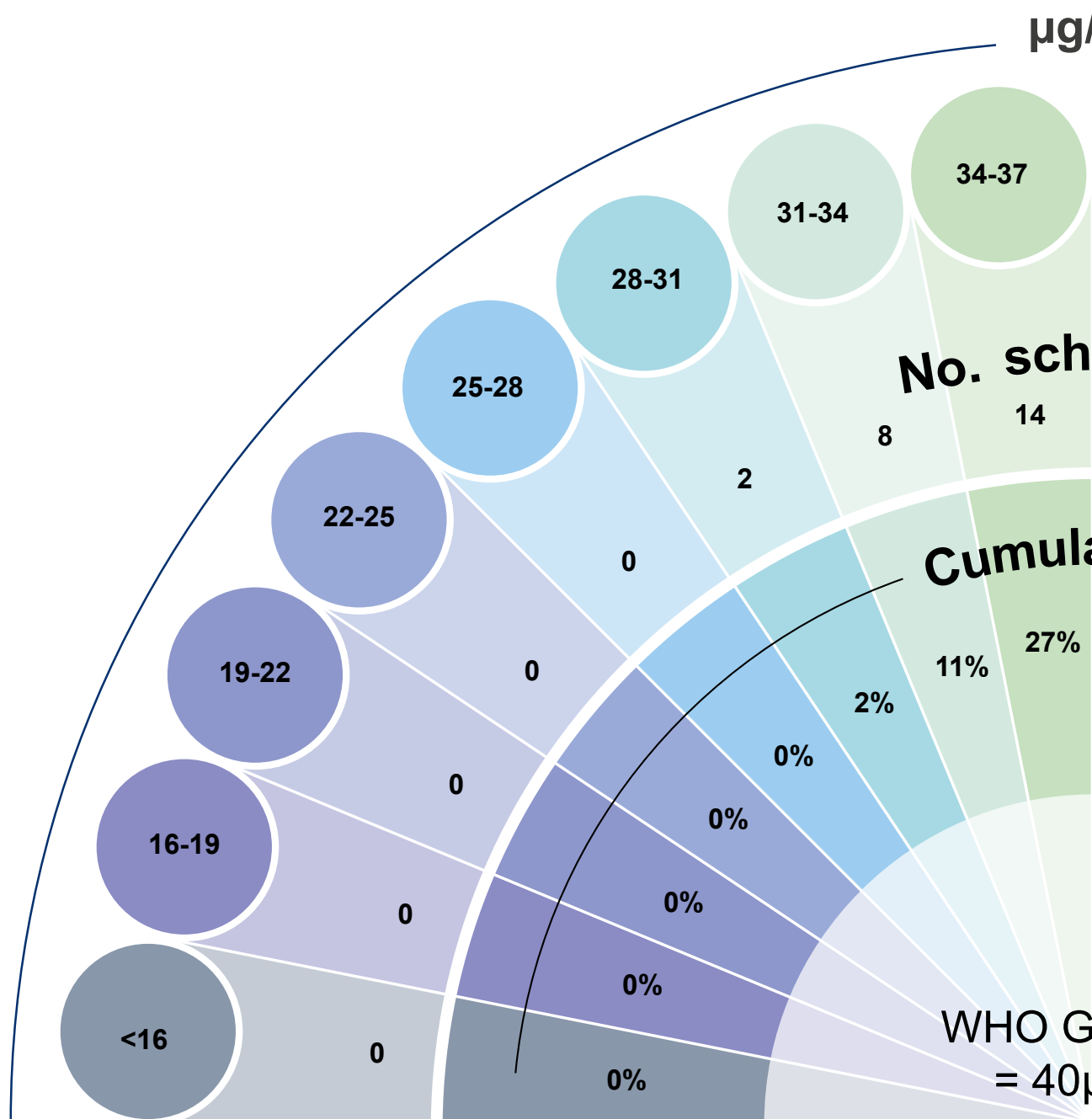
- Air quality levels recorded at each school.
- The average volume of daily traffic movement (and type of vehicles) on the roads surrounding schools.
- Which vehicle types contributes towards transport related emissions.
- How students in Westminster typically travel to / from school.
- Some of the reoccurring key issues identified through the audits, that potentially effects air pollution.

Air Quality

The council has undertaken their own air quality monitoring at all schools and programme, are detailed below. This confirms the number of schools located

The annual mean national Air Quality Objective (AQO) is $40 \mu\text{g}/\text{m}^3$ and in the

- A total of 41 schools surveyed with average levels of NO_x beneath $40 \mu\text{g}/\text{m}^3$
- A total of 48 schools surveyed with average levels of NO_x greater than $40 \mu\text{g}/\text{m}^3$



*Number of school with average

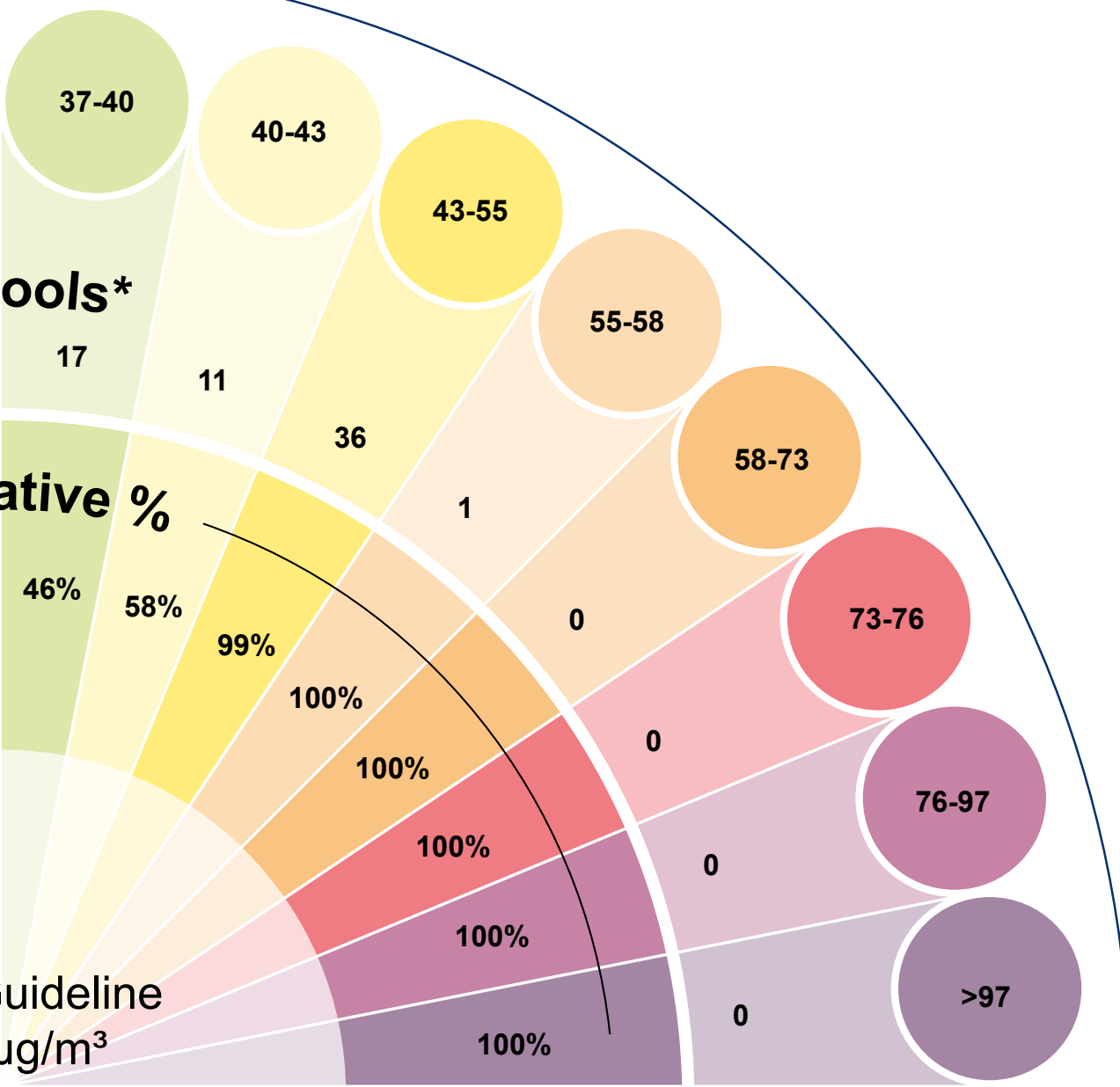
and the average NO_x measured at the schools audited as part of this
 in areas with low, medium or high levels of pollutions.

the period surveyed, there were:

h³.

ug/m³.

/m³

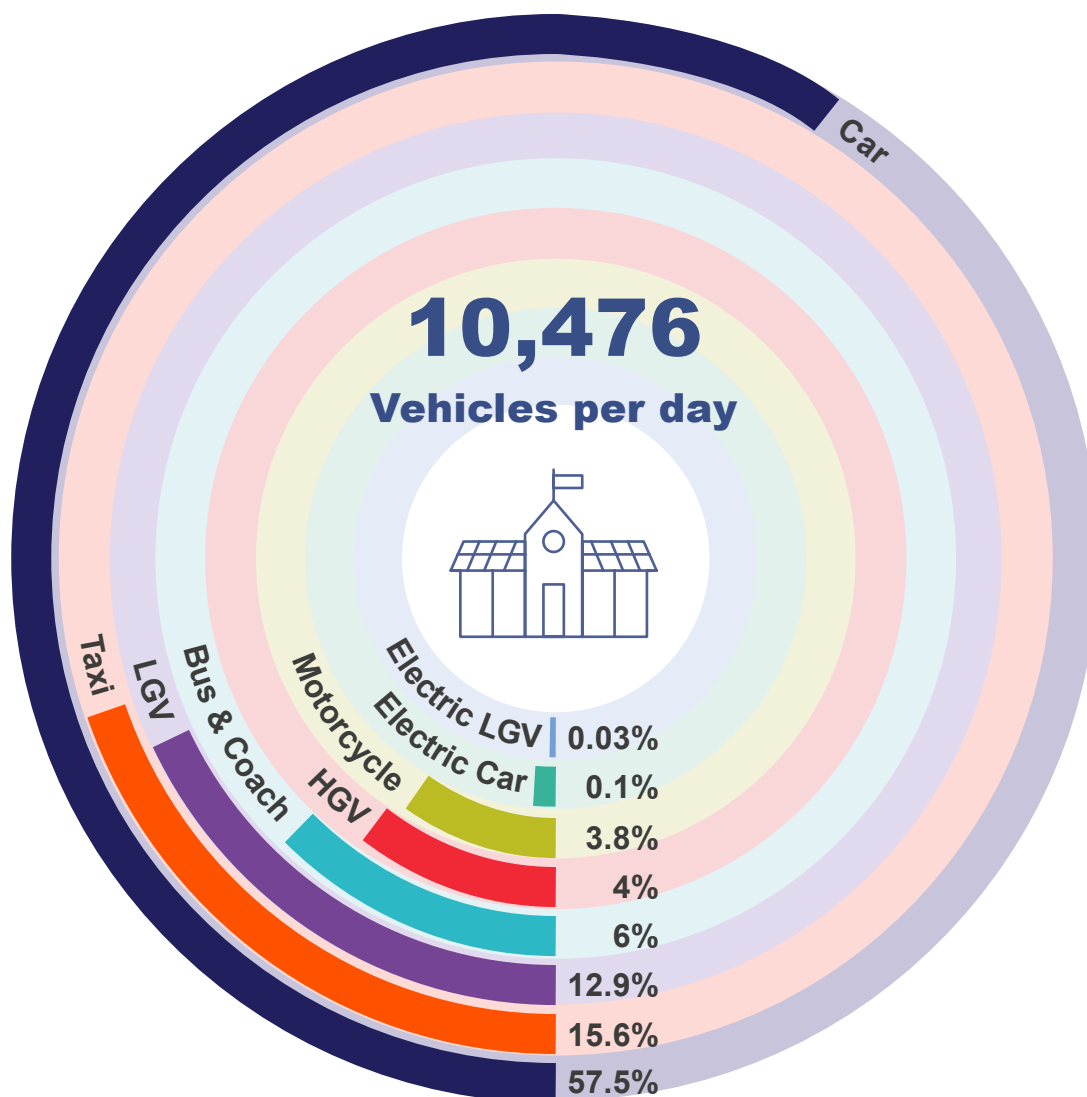


average emissions within the band

Traffic Volume

- Road transport is a major contributor to emissions and has a significant impact on air quality, account for nearly 50% of NO_x emissions.
- Noting this, a key part of the desktop review undertaken for each school prior to audits involved reviewing traffic flow surrounding the school site (typically within a 200m radius).
- The image below confirms the typical traffic flow mix across all schools in London.

Local Traffic for Westminster School (Average)

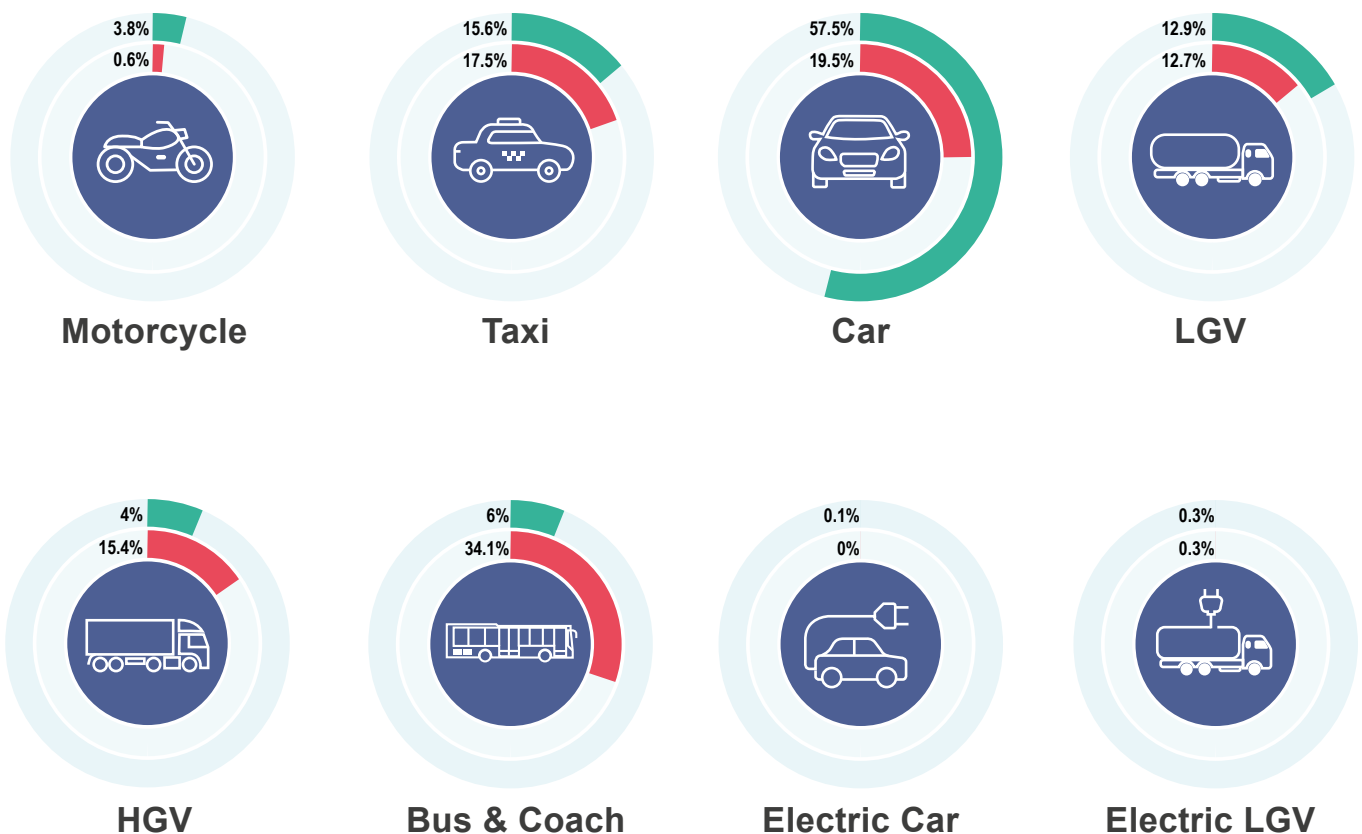


Traffic Emissions

Vehicle emissions data of the local highway network for each school, split by source, was analysed to identify the key transport sources contributing to NO_x in the vicinity of each school.

The figure below, illustrates the average typical traffic mix (by vehicle type) recorded at schools audited and how these vehicle types contribute towards worsening air quality.

In addition to road transport related emissions, sources of emissions from demolition and construction work (a major contributor to local particulate matter) and heating systems (a major source of NO_x) was also considered.



Green: Road Transport Volumes

Red: Road Transport NO_x Emissions

2016 LAEI Average Vehicles (AADT) - split by type (000s)

2016 LAEI Average Vehicle Emissions (tonnes per annum) - split by source sector

Travel Behaviour

There are approximately 31,500 students in Westminster, of which, over 27,000 have taken part in a hands up survey, providing detail on how they typically travel to and from school.

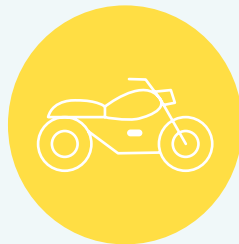
This information was examined as part of the school air quality audits, to help put forward recommendations that could help in reducing sources and exposure to emissions.



Public
Transport
40%



Walk
31%



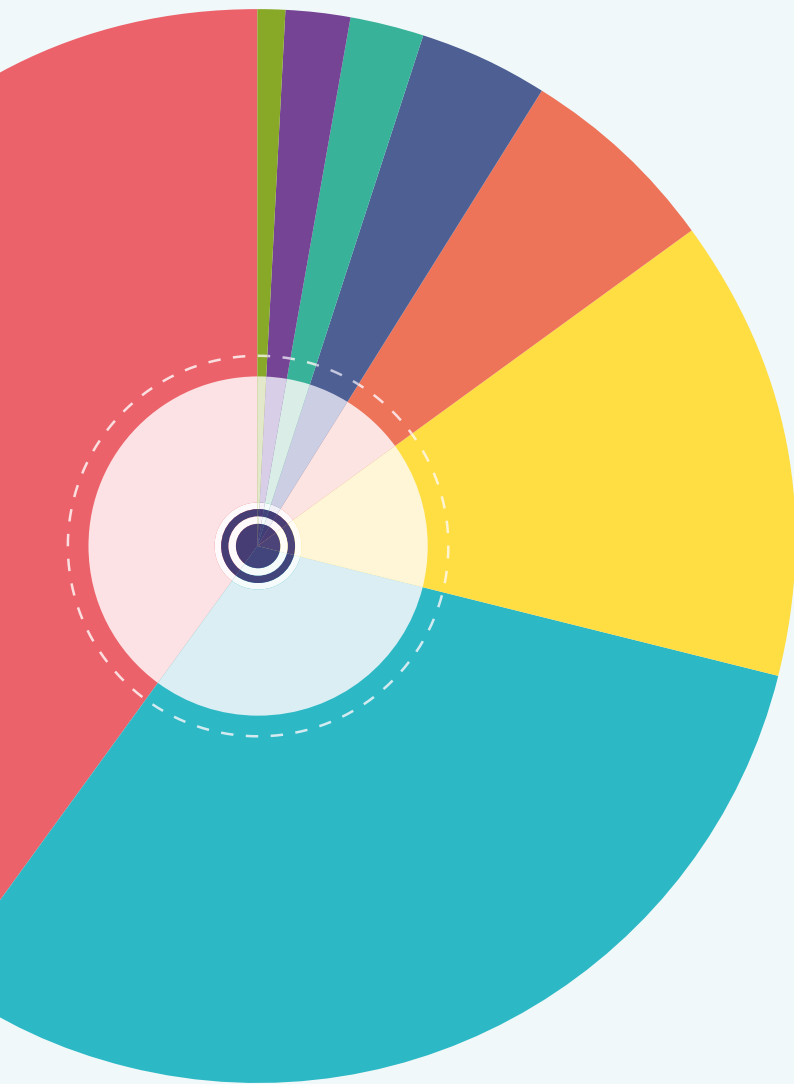
Private Car /
Motorbike
14%



Scooter /
Buggy
6%

STUDENTS WHO
TOOK PART IN THE
HANDS UP SURVEY

27,000+



School Bus
and Taxi
4%



Cycle
2%



Park &
Stride
2%



Car
Share
1%



TOTAL NUMBER OF SCHOOLS
AUDITED WHERE MODE
SHARE DATA IS AVAILABLE

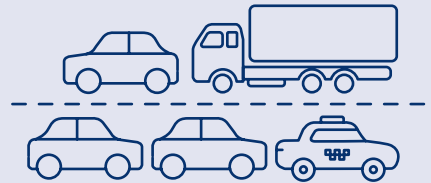
77

Common Issues

Below we summarise some of the reoccurring issues identified through the a



Heavily trafficked routes – many schools in Westminster are located on or near busy roads, with high volumes of traffic that contribute significantly to poor air pollution.



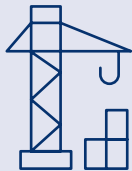
Rat running – some schools are located in areas where minor roads passing schools were used by through traffic, diverting from the primary network (usually to avoid congestion elsewhere) that can worsen local emissions as well as present road safety concerns.



Idling – was commonly observed outside the schools during peak drop-off times, when children will be most exposed to unnecessary emissions when in close proximity to the school gates. The Council is already pro-actively trying to tackle this issue via their #DontBeldle campaign, that has been referenced in many school specific reports.



Buses – many students travel to school via public transport (see Figure 3-8), including buses. Many schools have bus routes with frequent services that encourages sustainable travel, but does contribute significantly to road based emissions on main roads near schools. Buses and Coaches accounted for on average, 34% of transport related emissions.



Construction – Westminster experiences a significant amount of development and some schools were located adjacent to new developments, and therefore experience sources of emissions from non-mobile machinery, such as generators, as well as dust released into the air through the construction activities e.g. demolition.



Parking Behaviour – was a reoccurring issue identified by auditors, including drivers dropping off students in School Keep Clear markings and inappropriate parking, that would often negatively impact the pedestrian environment and may discourage more students from travelling on foot.



Lorries / Freight Activity – such activity was particularly evident at a number of the sites when located near major areas / roads or construction sites located within close proximity of the site. HGV's and LGV's accounted for on average, 27% of transport related emissions.

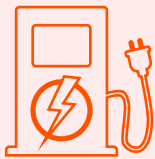


Congestion – many schools suffered from effects of congested traffic and queue back from junctions and other bottlenecks, such as bus stops, traffic signals etc., that increases sources of emissions. This is particularly the case for schools in Westminster that are located adjacent to busy roads.

audits, that potentially adversely affects air pollution.



Crossing / Severance – for the majority of schools, children walking to school will have to cross a busy road and wait for extended periods at the roadside where exposure to emissions is high. There were also a number of schools with particularly narrow footways, that could discourage more students from travelling on foot.



Electric Vehicle Charging Points – many schools have staff car parking on site, but no existing electric vehicle charge points that would help enable a transition to electric vehicles by school staff to help reduce emissions.



Cycle / Scooter parking – whilst some schools (often newer builds) would have good quality cycle and scooter parking, many schools, particular older buildings, would have a lack of suitable storage for scooters and bikes that can discourage some students from active travel.



Playgrounds / Outdoor spaces – many schools had limited screening from passing traffic for their play grounds, where children spend extended periods of time. This is a particular issue for school grounds located adjacent to heavily trafficked routes.



Waiting Area – in some instances, children were observed waiting in areas exposed to higher levels of emissions when arriving to school, prior to the school gates opening. For schools located adjacent to busy roads, children can be exposed to relatively high levels of pollution.



Inefficient Heating – many school buildings exhibited poor insulation, typically linked to the age of the building. This can lead to increased run times by boilers and therefore greater emissions.



Ageing Boilers – many schools have boilers that are aging and do not meet modern efficiency standards. This can result in higher levels of emissions locally.



Natural Ventilation – the majority of school buildings audited were constructed in the late nineteenth or early twentieth century and therefore reliant on opening of windows, that worsens exposure to emissions. This is particularly relevant, for school buildings located within close proximity of a busy road.



Walking Routes – whilst not a school grounds / building issue as such, many students were observed as using congested / polluted routes to walk to / from school. Linked to this, a number of schools reported students using public transport, despite living within walking distance of the school.

A person is writing on a whiteboard in a classroom setting. The whiteboard is filled with text, and the person is using a blue marker. The background shows a classroom with bookshelves and a window.

Recommendation

Based on the school air quality audits, a range of recommended measures and initiatives were identified for each school to help deliver air quality improvements and reduce exposure to air pollution.

When developing the recommendations, the unique characteristics of the local area, the school site and building were accounted for to help identify a suitable package of measures.



A 'toolkit of Measures' was produced by WSP, that can be used as a checklist of potential measures. The toolkit is publicly available and includes over 100 measures that can be considered, to help address air quality related issues.

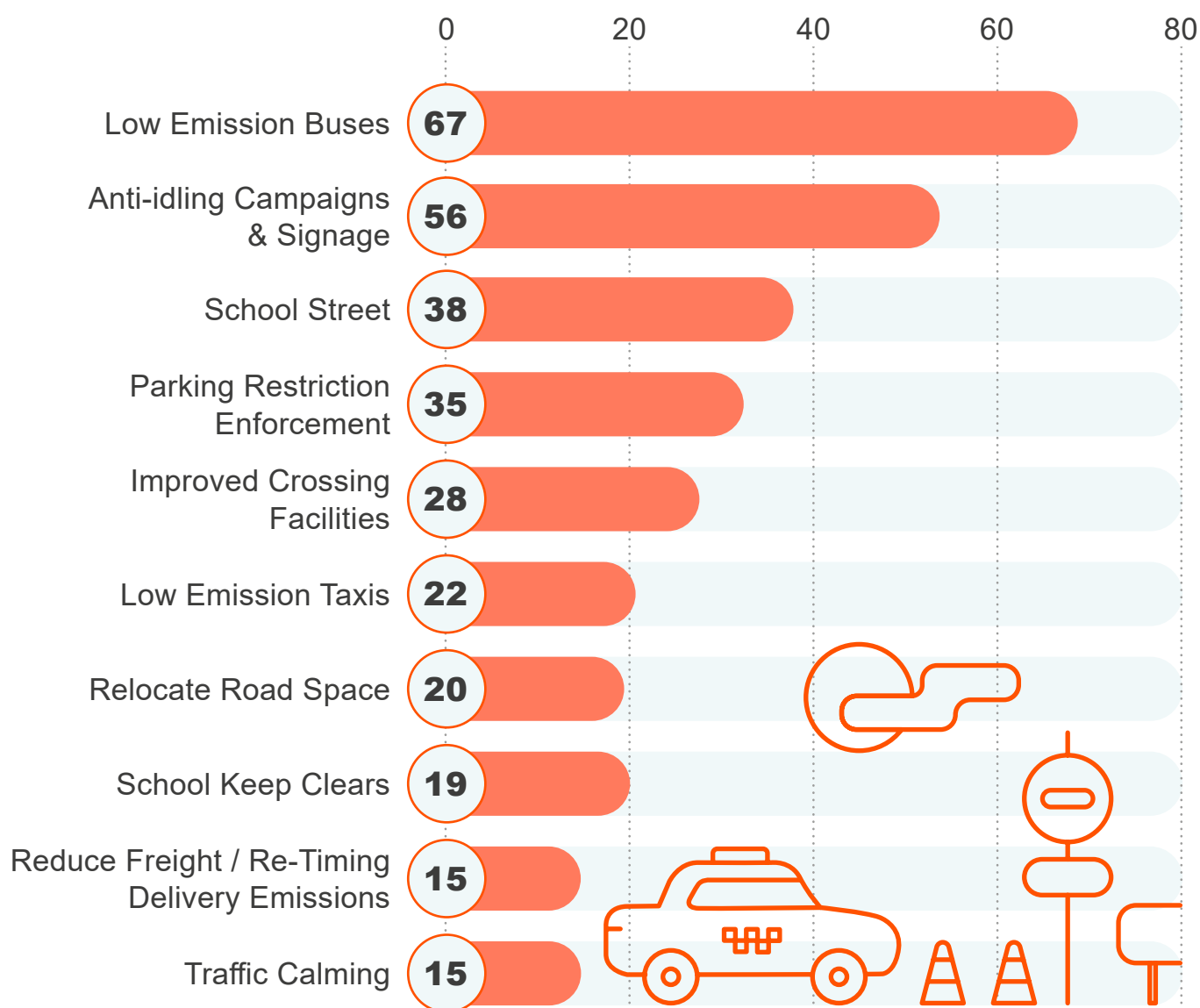
The toolkit is multidisciplinary and holistic in its approach, seeking to address a broad range of factors and includes both well established and simple measures, new technologies and more innovative and harder hitting solutions as well as physical and behavioural measures.

Highway Recommendations

As part of the audits, over 450 highway recommendations have been put forward across all schools audited that can be considered by the schools and Council to help reduce sources and exposure to emissions.

The recommendations have been tailored accordingly within each school report, to reflect the characteristics of the local area and observations noted from the auditors on the day of the audit.

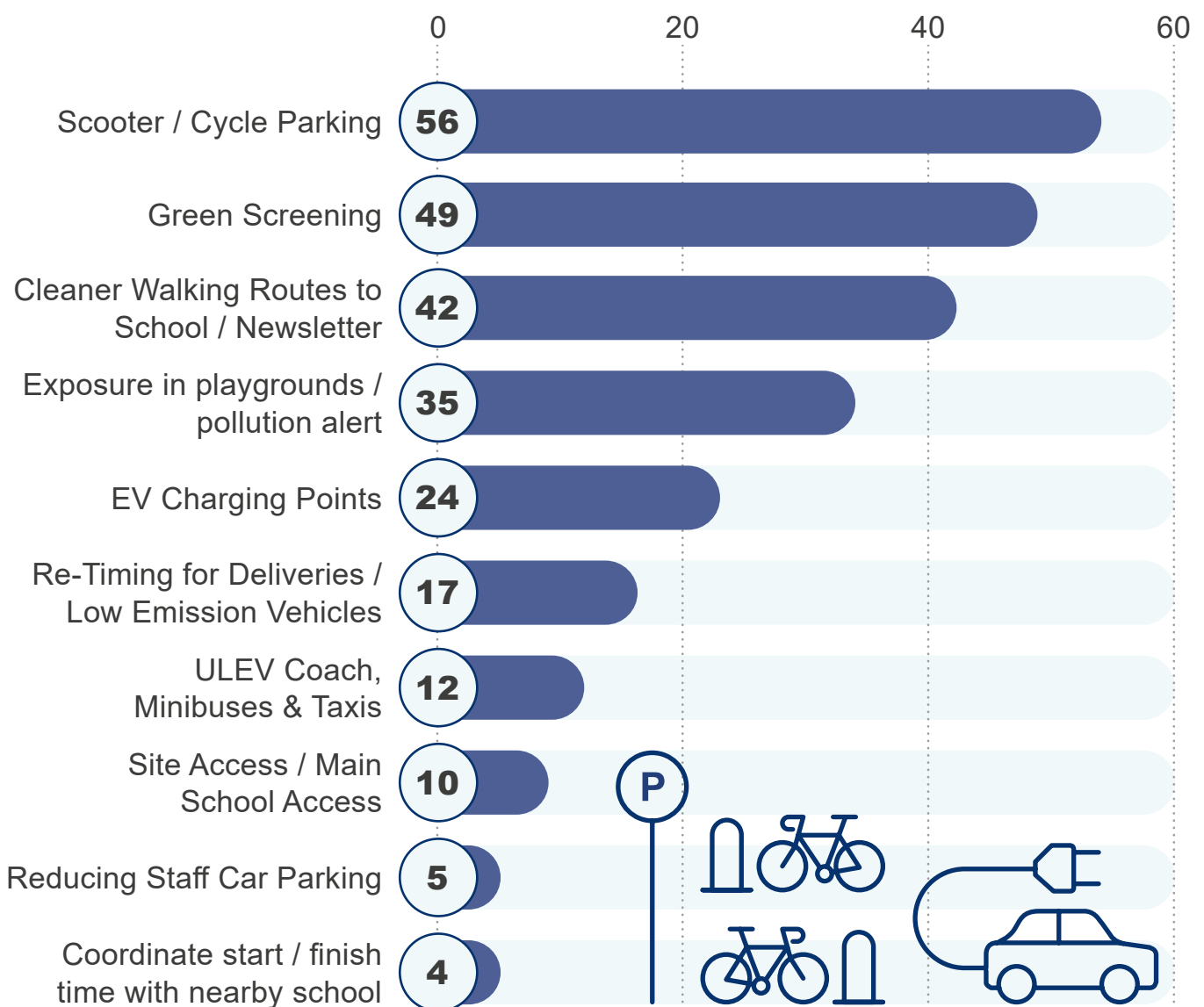
Top 10 Highway Recommendation



School Grounds Recommendations

As part of the audits, over 260 school ground recommendations have been put forward across all schools audited that can be considered by the school and Council, to help reduce sources and exposure to emissions.

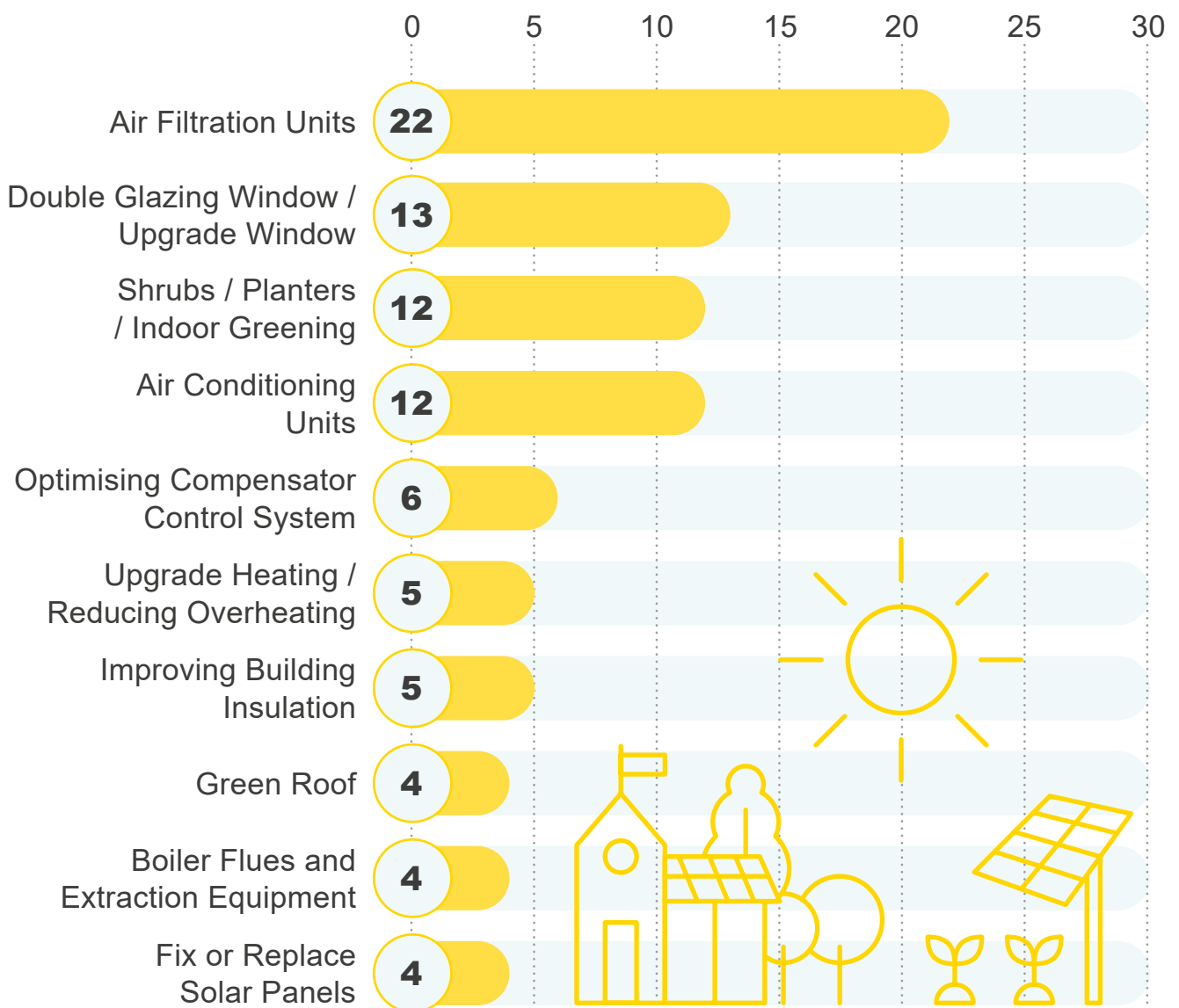
Top 10 School Ground Recommendations



School Building Recommendations

As part of the audits, over 100 school building recommendations have been put forward across schools audited pre Covid-19, that can be considered by the school and Council to help reduce sources and exposure to emissions.

Top 10 School Building Recommendations

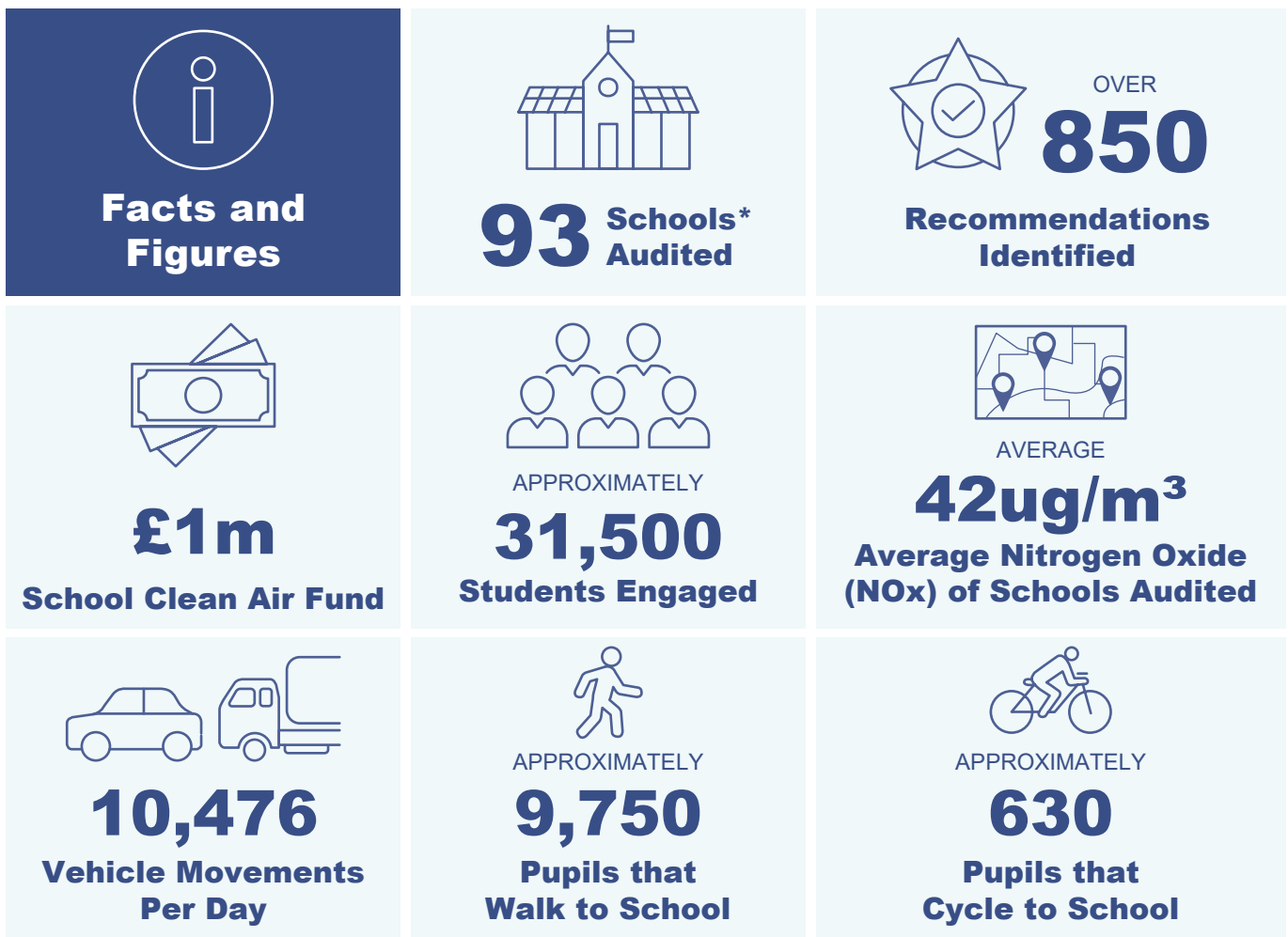


Note: For school audits that took place during Covid-19, there was no visit to the school premises to assess the building and therefore the most frequently identified issues with school buildings and potential measures that could be considered by the school, were presented.

Conclusion

Each school benefited from:

- A school air quality audit by a WSP auditor to help identify the key issues associated with the school, including site visits to observe drop-off / pick-up activity outside the school grounds when students are typically most exposed to air pollution.
- A full audit report, containing recommendations, tips and advice to help improve air quality around their school
- Opportunities to access Westminster's School Air Quality Fund that provides £1m of financial assistance to help schools implement the recommendations from the audits.



* Including schools audited as part of the Mayor's School Air Quality Programme.



City of Westminster

