



# EVERY CHILD'S RIGHT TO BREATHE LONDON: A CASE STUDY



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## LONDON: A CASE STUDY

How London is taking action on clean air  
and safe & healthy routes to school

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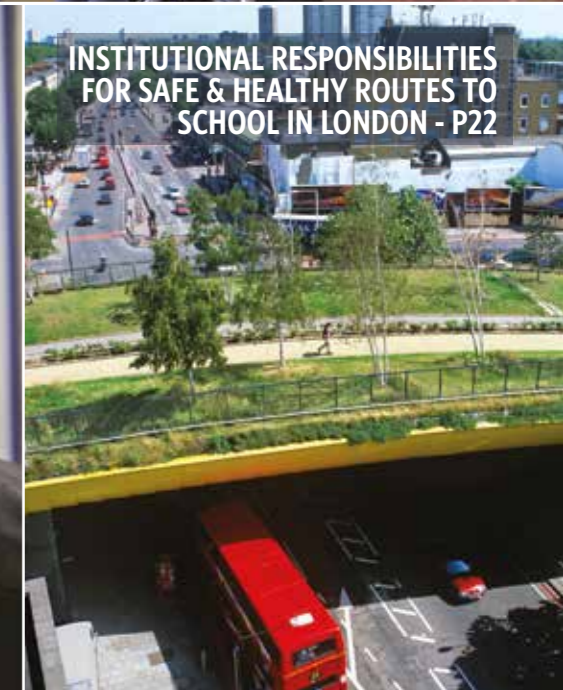
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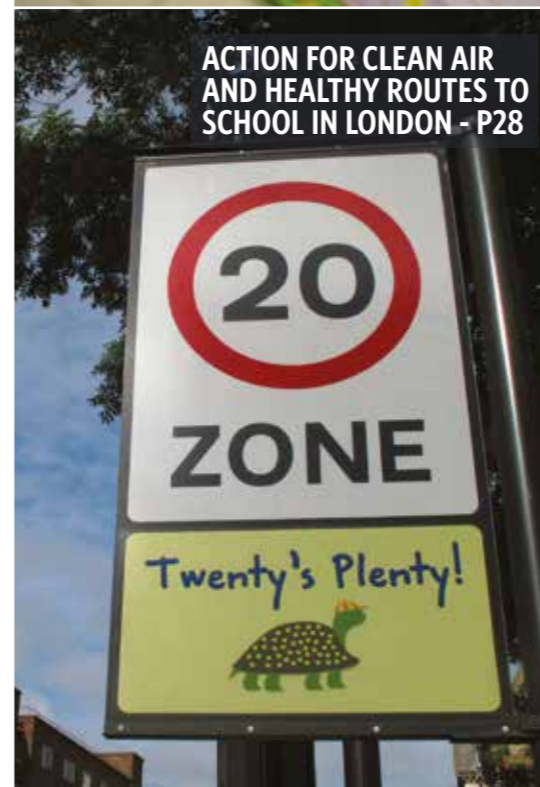
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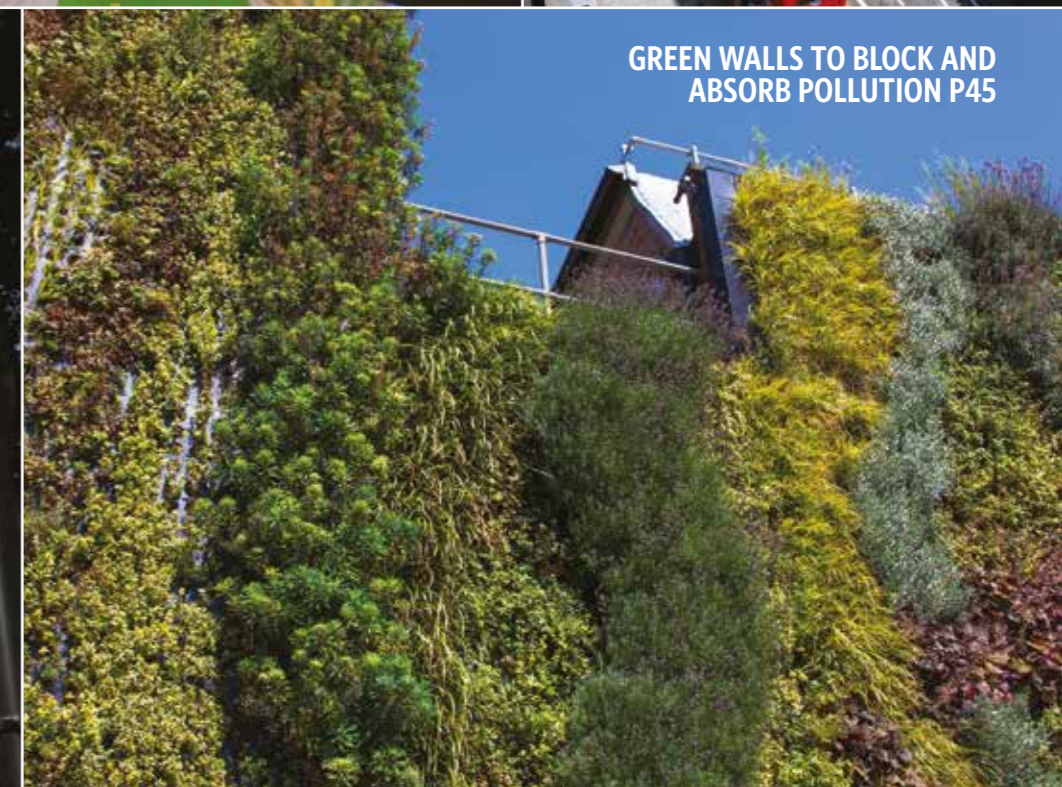
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# FOREWORD

**Air pollution affects everyone who breathes dirty air. However children are particularly vulnerable. They are physically smaller so breathe closer to vehicle exhausts. They also breathe at a faster rate than adults and so take in relatively more pollutants. Moreover, because their bodies are still developing, the toxic materials in the pollution can do lifelong damage.**

The FIA Foundation works globally to promote safe, clean, fair and green mobility. We support liveable cities which are safe to live and travel around in, and which enable children to be healthy and active. We believe that it is vital that where these matters are being addressed already; where there are successful initiatives in place which have engaged children and their parents, changed behaviour, or led to alternative transport systems; that they are shared. This way we will all learn from one another.

This report takes London as just such a case study, focusing on the issue of air pollution from vehicles and exploring the actions and policies in place to enable safe, clean and healthy journeys to school. This is not to say that London's initiatives in this regard are either perfect or entirely transferable to other cities. It is rather an attempt to share one city's efforts on this most vital of issues.



**Sheila Watson**  
Director of Environment  
and Research  
*FIA Foundation*

# TESTIMONIES FROM OUR EXPERT PARTNERS

## WHY WE MUST ACT NOW ON VEHICLE EMISSIONS

The International Council on Clean Transportation is the leading global organisation offering independent technical and scientific advice to regulators to improve public health and mitigate climate change from the transportation sector. A particular focus is the contribution of dirty vehicles in urban areas to the ongoing air pollution crisis in European cities such as London and Paris. The 'Dieselgate' scandal, which ICCT helped uncover, was a wake-up call that government compliance and enforcement programs are inadequate. Our response to it will be the true test of our commitment to protecting our people from avoidable harm.

This will require new technologies, new policy approaches and better consumer information, all of which are currently dependent on laboratory tested emission levels from vehicles which, as 'Dieselgate' showed, bear very little relation to what those vehicles are actually emitting on the road. In fact, real-world exhaust emissions from modern diesel cars - particularly in Europe - are many times higher under real-world conditions than under laboratory testing. In some cases, levels of nitrogen dioxide are 15 to 40 times higher. This failure - which is in large part due to car manufacturers deliberately cheating on tests - is costing lives, an estimated 28,000 in the EU alone in 2015.

There is a way through this situation. The regulatory regime in the US already includes rules designed to prevent cheating or 'defeat devices'. The technology also already exists to create clean, ultra-low emission vehicles. It is down to consumers, producers and policy makers to work together to force change in this area. This needs to happen urgently.

I am proud that the ICCT is part of The Real Urban Emissions (TRUE) initiative [www.trueinitiative.org](http://www.trueinitiative.org) which aims to independently monitor and report real-world vehicle emissions in cities. The initiative whose secretariat is at FIA Foundation in London is already working with C40 and the Mayors of London and Paris to measure real world emissions in their cities. The work, which will begin in London this year, is an essential under-pinning to the sort of policy framework which we so desperately need in order to clean up the air our children are breathing.



**Drew Kodjak**  
Executive Director  
*International Council on Clean Transportation (ICCT)*

## EVERY CHILD HAS THE RIGHT TO BREATHE

At UNICEF, we believe that every child has the right to survive and thrive. Every child also has a right to a safe environment. Yet far too often these basic rights are violated. In some respects, we've made huge progress in key areas of development but there some of the biggest threats to child survival remain neglected. Air pollution and dangerous roads are two such threats which our children face every single day.

A staggering 500 children lose their lives each day because of road traffic injury. While this is the number one killer of older children worldwide, air pollution is also an immense and growing health burden - a major contributing factor in the deaths of around 600,000 children under the age of five each year. This is why the policy priority of a safe and healthy journey to school for every child is so important. We at UNICEF are proud to be contributing to the Child Health Initiative (CHI) [www.childhealthinitiative.org](http://www.childhealthinitiative.org). Thanks to its work, already governments and cities around the world have signed up to the priority of a safe and healthy journey to

school as a key part of the UN's New Urban Agenda. Our task now is to turn these words into action. We have the means to combat the global killers our children face every day. We know that the 'speed vaccine' - low speed zones around schools - saves lives, and that we must reduce our children's exposure to toxic air. Every child has the right to access education, to a safe journey to school, to breathe clean air, to survive and to thrive. In global policies, in urban development we must put our children first.



**Mike Penrose**  
UK Executive Director  
*UNICEF*

## CITIES ARE AT THE FOREFRONT OF THE FIGHT AGAINST AIR POLLUTION

Outdoor air pollution contributes to more than 3 million deaths globally each year, the vast majority of them in cities. The same emissions that poison our air are also causing climate change. That is why the mayors of the world's great cities are taking bold and urgent steps to tackle air pollution. From making it easier for people to travel on foot or bicycle, to replacing fleets of buses, rubbish trucks and police cars with low-emission vehicles, cities are finding unique solutions to improve the quality of the air that citizens breathe. Compact, well connected and pedestrian and cycle-friendly communities create less air pollution and therefore less greenhouse gas emissions, but are also healthier, more equal and economically prosperous.

Mayors, city officials and even citizens cannot make informed decisions about how to tackle air pollution unless they understand the sources of emissions and the likely impact of different options. As a network of 91 of the

world's leading cities committed to urgent action on climate change, C40 has a vital role in supporting cities to collect and use their data in the most effective ways possible. C40 is supporting this effort through its work with the TRUE initiative [www.trueinitiative.org](http://www.trueinitiative.org). The goal is simple: giving consumers more accurate information about the true levels of pollution that cars emit so they can make better informed decisions about which vehicles they drive. Creating sustainable, healthy and liveable cities requires urgent action, and this initiative is a crucial part of the global momentum for change underway on the streets of our cities.



**Mark Watts**  
Executive Director  
*C40*

## POOR AIR QUALITY IS A HEALTH PRIORITY

Air quality in cities around the world is getting worse, particularly in developing countries. In Nairobi, where I live and work, you can see and taste the dirty air, particularly near to busy roads. Dirty vehicles are a significant cause of the problem. Children are smaller, and so closer to exhaust pipes, and as a result we have too many children in our schools with respiratory conditions linked to the polluted air. These are diseases which may never leave them, caused in childhood by pollution, and affecting their life chances forever.

We can only solve the problem of air pollution and vehicle emissions through an integrated approach, involving manufacturers, consumers and public authorities, which combines:

- 1 A new approach to city planning, giving preference to active transport - walking and cycling - and designing and organising cities around people and mobility needs rather than cars. UNEP and the FIA Foundation's 'Share the Road' initiative [www.unep.org/transport/sharetheroad](http://www.unep.org/transport/sharetheroad) works with cities to introduce policies that prioritise funding for non-motorised transport infrastructure in order to improve road safety, reduce emissions and promote better health. Kenya has already adopted these guidelines, and we are working hard to get other countries on board also.
- 2 By introducing quality affordable mass transit, such as bus rapid transit systems and light rail. An integrated

mass transit system is a fast and more efficient way of moving large numbers of people around and reduces congestion and pollution. Investment should therefore be directed here - and not at more urban road building.

- 3 By introducing cleaner and more efficient vehicles, switching to lower and no emissions vehicles, including electric cars and 2 and 3 wheelers. New electric mobility is particularly exciting for cities. For example, in China there are now over 200 million electric motorbikes, and we may start to see such new technologies spreading rapidly in the coming years.

Again, UN Environment is delighted to be working with the FIA Foundation and other partners on a range of initiatives supporting cleaner, more efficient vehicles in developing countries, including the Global Fuel Economy Initiative (GFEI) [www.globalfuelconomy.org](http://www.globalfuelconomy.org), and the Partnership for Cleaner Fuels and Vehicles (PCFV) [www.unep.org/transport/pcfiv](http://www.unep.org/transport/pcfiv). We believe that the Child Health Initiative (CHI) [www.childhealthinitiative.org](http://www.childhealthinitiative.org) is a vital next step to place greater emphasis on all of these issues as they relate to children - the true indicator of our success in terms of sustainable mobility.



**Rob de Jong**  
Head, Air Quality  
and Mobility Unit  
*UN Environment*

# EXECUTIVE SUMMARY

London is taking action on clean air and safe and healthy routes to school. The journey to and from school, and the experiences that children have during that journey can have long term effects on their health, well-being, and future travel decisions. The challenge is threefold:

- To clean up the toxic city air which our children breathe whether they are walking or travelling in vehicles.
- To ensure safe journeys to and from school by promoting a road system which reduces safety risks.
- To increase the rates of walking and cycling to and from school along lower pollution routes to benefit children, their families, communities and the environment.

Particulate matter (PM) and nitrogen dioxide (NO<sub>2</sub>) from vehicles affect children's respiratory systems, and have wide-ranging health impacts. Nearly two million people in London currently live in areas that exceed the guideline annual mean values for nitrogen dioxide set by the World Health Organisation (WHO). Almost 400,000 of them are children. Most concerning of all, over 800 schools and other educational institutions in the capital are located within 150m of roads that breach legal limits for air quality.

Part of the solution to reducing emissions includes switching from using cars to walking and cycling or taking low emission public transport. Walking along streets with lower levels of traffic, such as quieter backstreets can cut exposure to air pollution in half. Active travel for children contributes to improved alertness and concentration in lessons, and improved physical health. To make this shift, people must be able to walk or cycle on safe, clean, convenient and attractive routes. Lowering traffic speeds is also a proven way to save lives and avoid serious injuries.

The Mayor of London has made improving air quality across the city a priority, particularly those most at risk, such as children. The Mayor's business plan commits £2.1bn to creating Healthy Streets by 2021/22, including spending on walking, cycling and improving road safety, public spaces and air quality.

Unified voices calling for action can help to build the case for change and justify action. Many different groups have been campaigning for the issue of air pollution to be taken seriously by government, including health professionals, environmental organisations and sustainable travel campaigners.

London's local authorities have primary responsibility for the most schools and roads and planning decisions, as well as responsibility for local air quality.

Action on air quality will only be effective if it is part of a wider strategy on vehicles, fuels and improved public transport. London is grappling with these challenges, and taking a range of actions to reduce emissions. This includes restrictions on vehicles, such as the Congestion Charge, Low-Emissions Zone, and the forthcoming T-Charge and Ultra-Low Emissions Zone, as well as support for low emissions vehicles and anti-idling campaigns. London has an extensive air quality monitoring network and provides public health information and alerts by text message about air pollution, and automated messages on bus stops warning of high pollution episodes. It is supporting independent data on real-world vehicle emissions through the TRUE initiative [www.trueinitiative.org](http://www.trueinitiative.org), which will help inform consumer decisions and vehicle policy.

Interventions to support walking and cycling have the potential to reduce emissions and improve air quality, as well as improving the streets for everyone. Local changes across the city can make a big impact on people's lives. London has significant plans to improve streets and support safe and healthy routes to school. The Mayor of London has also launched air quality audits for the worst affected schools. The new approach to Healthy Streets emphasises the benefits from active travel, as well as emphasising the importance of attractive public spaces. It is vital that the perspective of children is included as these are taken forward locally to support a network of safe and healthy routes to school that empower children to walk and cycle in cleaner air. Providing training and support for sustainable and active travel, as London does through the STARS programme, also does this, including helping children identify routes and suggest improvements.

London's problems are repeated in countless cities around the world. National governments and city authorities need to take action. Key lessons from London include:

- Leadership is vital
- Engage, & work together with, a range of different groups
- Real change requires action at more than one political level
- Accurate information is vital for evidence-based policy & informed consumer choices
- Involve children & design streets with them in mind
- Put healthy routes at the heart of plans, funding & appraisal
- Regulate to limit vehicles & reduce emissions
- Embrace technology





## INTRODUCTION

Clean air should be a basic human right, yet billions of people globally live in dirty and dangerously polluted cities. Improved air quality and significantly reduced road traffic deaths are key elements of the United Nations (UN) Sustainable Development Goals (SDGs), which aim to end poverty, protect the planet, and ensure prosperity for all.<sup>8</sup> The New Urban Agenda, a roadmap for sustainable development for cities agreed at the UN Habitat III conference in Quito in October 2016, calls for a 'safe and healthy journey to school for every child'.<sup>9</sup> National governments and city authorities have made commitments under these global agreements. They now need to take action. Clean air and liveable cities must be prioritised.

This report takes London as a case study. It is a desk-based review of the issues of air pollution and safe and healthy routes to school in London, and actions that different stakeholders are engaged in. It was also informed by meetings with several key stakeholders. It aims to provide an overview of London's approach and to highlight lessons for other cities.

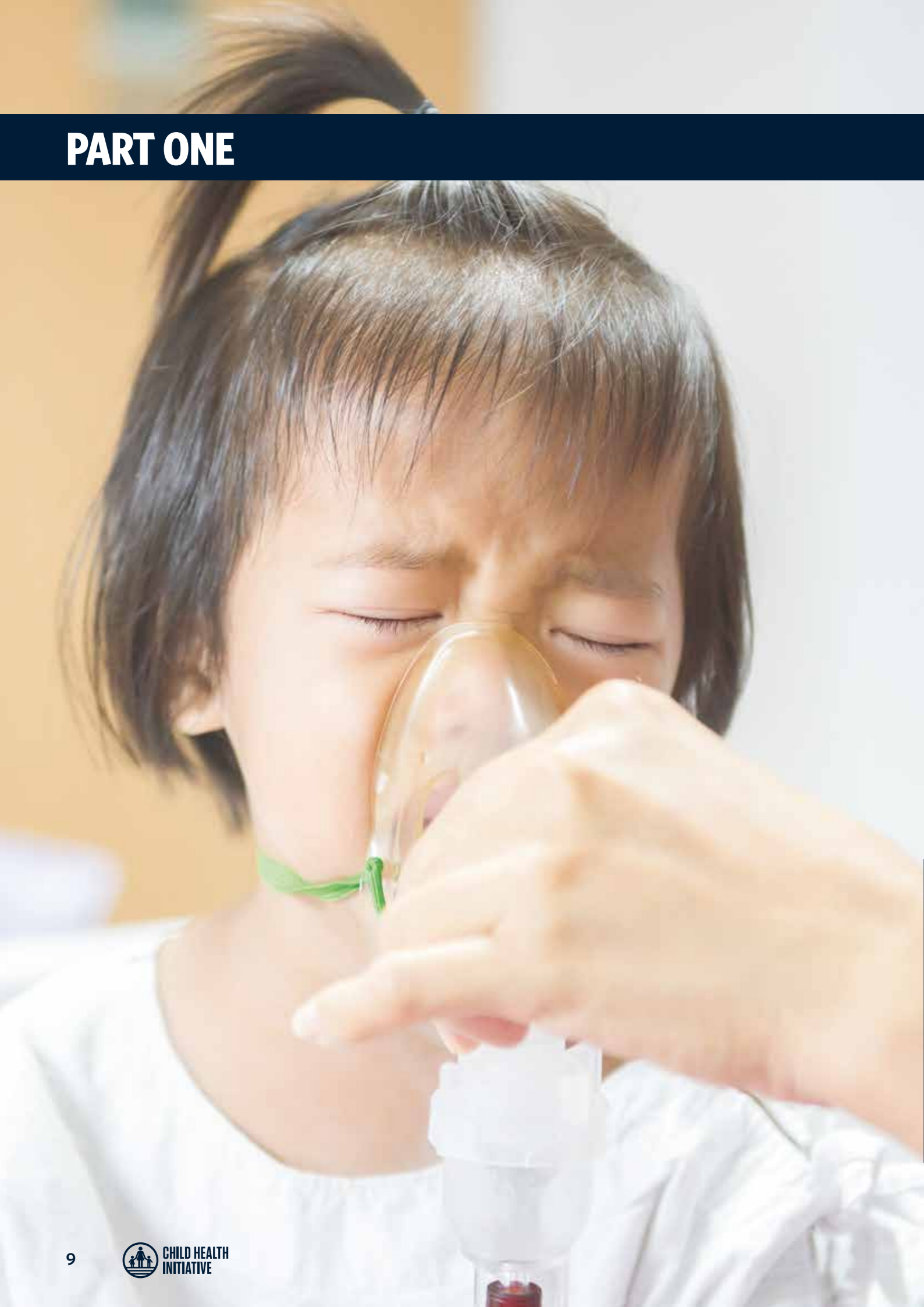
- **Part One** sets out the reason for focusing on air pollution around schools. It provides a background to the scale of air pollution from vehicle emissions and their impacts on children's health.
- **Part Two** explores trends in school travel in London. It looks at the opportunities for safe and healthy journeys to and from school, including the potential benefits of walking and cycling, and evidence around the relationship between behaviour change, road safety and urban design.
- **Part Three** provides an overview of the different institutions with responsibilities for safe and healthy routes to school in London, including national government, the Mayor and local authorities. This sets out the policy context and the different stakeholders involved.
- Finally, **Part Four** aims to set out the range of actions that are being undertaken in London that help enable safe and healthy journeys to and from schools, including many bold new initiatives.



“Children are much more vulnerable to pollution than we adults are. So we should make sure that the road from home to school is safe, safe from accidents and safe from pollution.”<sup>9a</sup>

**Erik Solheim**  
EXECUTIVE DIRECTOR  
United Nations Environment Programme

## PART ONE



## AIR POLLUTION AND CHILDREN'S HEALTH

Countless children endure wheezing or struggle to breathe because of toxic vehicle emissions.<sup>10 11</sup> While childhood asthma attacks are a particularly alarming impact of poor air quality, other longer-term developmental impacts are also taking place unseen inside children's bodies.

### WHAT IS AIR POLLUTION?

Air pollution consists of a mixture of harmful gases, dust and soot. The particles are very small – mostly invisible – but the damage they do is profound. The two main ongoing pollutants in London are particulate matter (PM) and nitrogen dioxide (NO<sub>2</sub>). At high concentrations NO<sub>2</sub> causes inflammation of the airways and long-term exposure affects lung function. It can also increase asthma symptoms. Particulate matter aggravates respiratory and cardiovascular conditions. The smaller the particle, the deeper it will deposit within the respiratory tract.<sup>12</sup> Other major pollutants include sulphur dioxide and carbon monoxide, both of which have been reducing in recent years, and ozone, which tends to be highest in the suburbs or countryside.<sup>13</sup> CO<sub>2</sub>, which is also emitted from vehicle exhausts, contributes to climate change, but does not directly impact human health.

### HEALTH IMPACTS

Infants have a higher metabolic rate than adults, so they breathe a greater volume of air per minute relative to their size. Breathing the same pollutant concentrations, children have a two to four-fold higher dose reaching

their lungs compared to adults.<sup>14</sup> Children also tend to be exposed to greater levels of pollution than adults because they are nearer to ground level and pollution from vehicle exhausts when travelling near roads.<sup>15</sup>

Research by King's College over six years in London's Low Emissions Zone found that children's exposure to traffic pollution in central London is associated with decreased lung function and lung volumes.<sup>16</sup> Exposure to air pollution during pregnancy is also linked with low birth weight and premature birth, with can subsequently impact on children's lungs.<sup>17</sup> A US study found that children living in areas with high levels of particulate matter are four times more likely to have reduced lung function in adulthood than those living in less polluted areas.<sup>18</sup>

The WHO's International Agency for Research on Cancer has classified air pollution as a known cause of lung cancer, especially fine particle matter.<sup>19</sup> Lung cancer has a long latency period, but childhood exposure could contribute to the development of a range of cancers in later life.

The UK's Royal College of Physicians and Royal College of Paediatrics and Child Health has concluded that children are particularly vulnerable to the effects of air pollution, including possible effects on mental and physical development.<sup>20</sup> Children attending schools which have higher traffic-related air pollution have been found to exhibit lower rates of cognitive development than those in less polluted areas.<sup>21</sup> Tragically twelve children die each year in London as a result of asthma.<sup>22</sup>



“ Developing heart, lung, brain, hormone systems and immunity can all be harmed by pollution. Environmental effects on the embryo, foetus, baby and toddler may last a lifetime, but may take years or even decades to become apparent.”

**Royal College of Physicians /  
Royal College of Paediatrics and Child Health**  
Report: 'Every breath we take: the lifelong impact of air pollution'



## AIR QUALITY AND SCHOOLS IN LONDON

### AIR QUALITY IN LONDON

Dirty air is linked to the premature deaths over 9,400 Londoners each year.<sup>24</sup> It also affects the health and wellbeing of many more, including the 1.1 million people in London who have been diagnosed with a lung condition.<sup>25</sup>

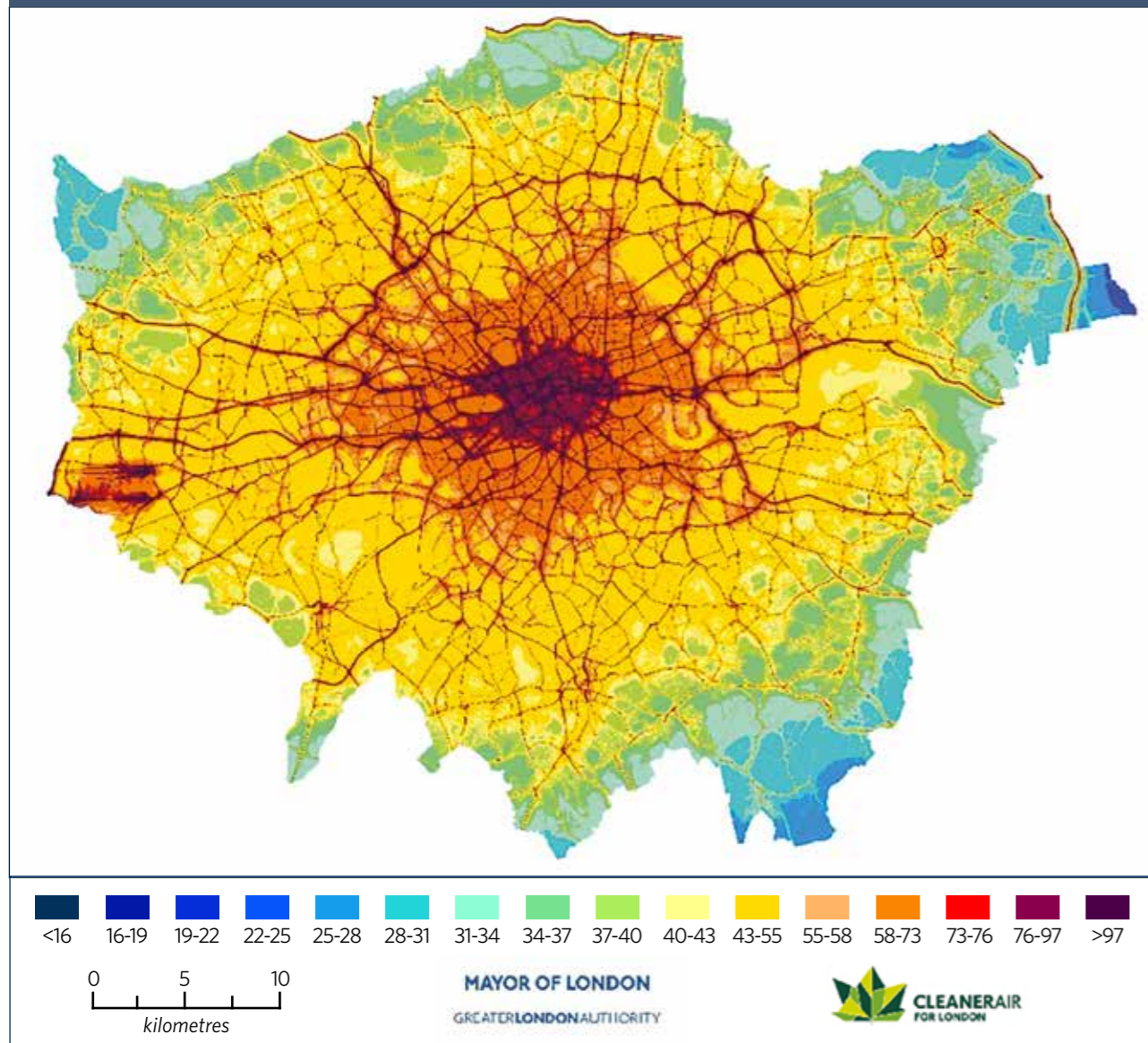
Although there are seasonal peaks and some ongoing variation in air quality caused by weather conditions, across London children are repeatedly exposed to dangerously polluted air. The single biggest cause of air pollution in London is road transport.<sup>26</sup> Vehicle pollution

has a significant impact and is most concentrated around busy roads. Air pollution exceeds guideline annual limits in just about all of central London.

Population growth also means that many more households live in the most polluted areas of inner London than a decade ago.<sup>27</sup> In outer London, the worst pollution is found along the major road networks and around Heathrow airport (see Figure 1 below).<sup>28</sup>

The economic costs of the health impacts of exposure to PM2.5 and NO<sub>2</sub> in London are up to £3.7 billion each year.<sup>29</sup>

FIGURE 1: GREATER LONDON - ANNUAL MEAN NO<sub>x</sub> CONCENTRATION 2013



### AIR QUALITY AND SCHOOLS

Over a million school-aged children live in London and the majority of their daily journeys are to or from school.<sup>30</sup> On average children travel around 1 mile to primary school and 2 miles from secondary school.<sup>31</sup> Over the course of their education, they will make these journeys thousands of times on weekday mornings and afternoons. It has been estimated that this accounts for around a third of children's daily exposure to traffic pollution.<sup>32</sup>

Unsurprisingly, air quality in and around schools is a concern for parents. Research by London Councils, the umbrella body that represents the London boroughs, shows that nearly a quarter of Londoners surveyed said that air quality affects their choice of school - with 12% saying that their children's health has been affected by air pollution.<sup>33</sup>

Children can also be exposed to air pollution as they play in the playground or when inside buildings. Analysis by air quality consultants Aether for the Mayor of London has found that across London, 360 primary schools are located within 150m of roads that breach legal limits for air quality, with over 800 schools and other educational institutions in areas that exceed these limits.<sup>34</sup> The majority of the schools in the most exposed areas have more than 40% of pupils who are eligible for free school meals, a marker of deprivation. Londoners living in the most deprived areas are on average more exposed to poor air quality than those in more affluent areas. 46% of the most deprived 10% of areas breached EU limits on NO<sub>2</sub>, compared with 2% in the richest 10% of areas.<sup>35</sup>

As recent Aether research confirms, it is often the children from the poorest families, living near major roads, who are most affected by air pollution, whilst contributing least to it as their families are less likely to own a car.<sup>36</sup> This is clearly inequitable.



### KEY FACTS : AIR POLLUTION AND CHILDREN'S HEALTH

- Children who live in polluted areas are four times more likely to have reduced lung function in adulthood
- Developing heart, lung, brain, and hormone systems and immunity can all be harmed by air pollution
- Air pollution from diesel vehicles is a cause of cancer.
- The single biggest cause of air pollution in London is road transport
- The journey to and from school accounts for around a third of children's daily exposure to vehicle pollution
- Over 800 schools and other educational institutions in London are in areas that exceed air quality limits
- London's most deprived areas are exposed to worse air quality than more affluent areas

## AIR POLLUTION AND MEGACITIES GLOBALLY

UNICEF's Clear the Air for Children report<sup>26</sup> identifies that around 300 million children globally live in areas where the air is toxic - exceeding international limits by at least six times.

Nearly 90% of all deaths from illnesses associated with outdoor air pollution occur in low- and middle-income countries.<sup>38</sup> The majority of these are currently in Asia. However, with increasing industrial production and vehicle use in Africa, outdoor pollution from vehicles is rising there also. The WHO estimates that urban air pollution levels in Africa could triple or quadruple within 15 years unless action is taken.<sup>39</sup>

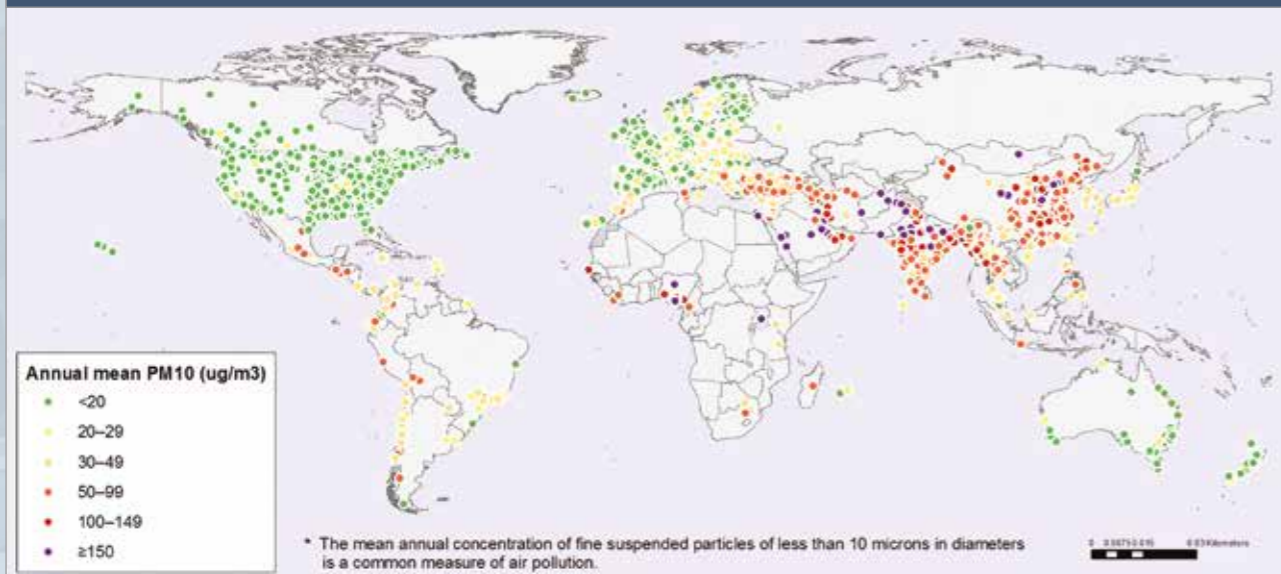
Children under the age of five in low and middle-income countries are 60 times more likely to die from exposure to air pollution compared with children in high-income countries, according to the Global Burden of Disease. Statistically for every 100,000 people, 31.5 die from air pollution in low- and middle-income countries, compared with 0.5 in high-income countries.<sup>40</sup> The majority of the world's population live in cities where the air pollution exceeds World Health Organisation guideline levels (see Figure 2 below). Currently, 54% of the world's population lives in urban areas, a proportion that is expected to increase to 66% by 2050. Projections show that



urbanisation combined with population growth could add another 2.5 billion people to urban populations by 2050, with almost 90% of the increase concentrated in Asia and Africa.<sup>41</sup>

Reducing air pollution is crucial to making progress on the Sustainable Development Goals (SDGs). Issues relating to air quality are included in three of the SDGs: SDG 3) Good Health and Well-being, SDG 11) Sustainable Cities and Communities and 12) Responsible Consumption and Production. Reducing air pollution also affects progress on a multitude of other SDGs, including SDGs 1, 2, 6, 7, 9, 13 and 15.

**FIGURE 2: CONCENTRATION OF PARTICULATE MATTER WITH AN AERODYNAMIC DIAMETER OF 2.5μ OR LESS (PM2.5) IN NEARLY 3000 URBAN AREAS\*, 2008-2015**



## AIR POLLUTION IN MAJOR CITIES



### BEIJING

Air pollution levels in Beijing can reach 40 times the recommended exposure limit. As a result schools and parents often restrict the amount of time that children spend outside.<sup>42</sup> Many children wear facemasks, while some international schools have built domes over playing fields to attempt to filter the air.<sup>43</sup>

### NAIROBI

In Nairobi, air pollution is caused by a complex mix of factors, including burning of solid fuels such as wood, charcoal, and kerosene stoves within the household. However, low and poorly enforced vehicle and fuel standards mean that vehicles produce far greater quantities of many pollutants than in London.<sup>44</sup> Respiratory illness is common, but a lack of monitoring is one reason why it is difficult to get an overview of the issues in the city. 90% of respiratory illness in Nairobi is estimated to be caused by air pollutants, much of that due to vehicles.<sup>45</sup>



### MEXICO CITY

Mexico City's air quality was amongst the worst in the world in the 1990s, and was associated with respiratory illness and increased absenteeism from schools.<sup>46</sup> Over the past two decades, the city has made significant progress in reducing emissions as part of an initiative called 'ProAire', which has included a series of actions, including restrictions on cars.<sup>47</sup> However, air pollution worsened in recent years, in part because of urban growth challenges effectively enforcing restriction. As recently as April 2016 schools and nurseries were closed for a day because of the pollution.<sup>48</sup>

### DELHI

In Delhi, studies have shown that children are twice as likely to have respiratory illness as those living in less polluted areas.<sup>49</sup> In November 2016, authorities closed schools for several days during the worst episodes of air pollution.<sup>50</sup>



## PART TWO



## ENABLING SAFE AND HEALTHY JOURNEYS TO SCHOOL

Safe and healthy routes to and from school are essential if children are to achieve their potential. Access to education opens up learning and new opportunities. The urban environment can also play an important role in children growing up happy, healthy, inquisitive and independent. It can also help foster community and support strong social networks.<sup>51</sup> There are several key issues to be considered in addressing this.

Improvements in street design to improve safety and active travel, and policies to improve air quality

are mutually reinforcing. However achieving these improvements calls for radical change. It means creating streets that are safe for walking and cycling, designed with children in mind. Investment and co-ordination is needed to break out of the status quo of traffic dominated streets. Such measures include safe crossings and wider pavements for walking, but also require a more holistic approach to how we view mobility and cities. This offers an alternative to the "vicious cycle of more cars, more accidents, more pollution at the school gate, and less time to spend outdoors walking, playing and talking with friends."<sup>52</sup>



“Children are a kind of indicator species. If we can build a successful city for children, we will have a successful city for all people.”

**Enrique Penalosa**  
Mayor of Bogota<sup>53</sup>



### SCHOOL TRAVEL TRENDS

School travel in the UK has changed significantly in the last 50 years. In the 1970s, 80% of seven and eight year olds went to school unsupervised, but by 2010 it was less than 10%. During this time, road safety has improved, despite traffic volumes doubling,<sup>54</sup> but it has been at the expense of children's wider health and levels of active travel. Across the UK, one in five journeys on the road in the morning rush hour are taking children to school.<sup>55</sup> Transport for London's analysis suggests that 400,000 trips made for education purposes each day are potentially walkable. A third of these are made to drop off or collect someone, with many of these being the 'school run'.<sup>56</sup>

## BENEFITS OF ACTIVE TRAVEL

Walking and cycling to school is good exercise for children and can help keep them healthy. Physical activity is positively related to academic performance,<sup>57</sup> and alertness and concentration in lessons.<sup>58</sup> Experts recommend that children over five should engage in at least 60 minutes of moderate to vigorous intensity physical activity every day.<sup>59</sup> Currently eight out of ten children in London do not get this amount of exercise. Four out of ten children are defined as overweight or obese.<sup>60</sup>

Although air pollution is harmful to children, walking and cycling can actually help reduce exposure to vehicle emissions as car occupants often breathe higher levels of air pollutants than those on the street.<sup>60a</sup> Pedestrians and cyclists can reduce their exposure to air pollution by travelling on streets with lower levels of traffic, such as quieter backstreets. In areas of central London, taking quieter routes can cut exposure in half.<sup>61</sup> Buggy covers can also further reduce the exposure of very young children to fine particles.<sup>62</sup> Studies of adults have shown that the benefits of exercise also outweigh any potential harm from air pollution in nearly all situations.<sup>63</sup>



## BARRIERS TO SAFE AND HEALTHY JOURNEYS

Changing behaviours on the route to and from school isn't easy, particularly in the morning, when parents and children have time pressures. TfL research shows that 60% of parents of primary age children say that they would be willing to take alternative routes to avoid pollution, but only if it took less than five minutes more.<sup>64</sup> Parents reported more flexibility for taking alternative routes in afternoons after school, which may suggest that there are opportunities to start addressing the issue with a focus at that time.

TfL's research shows that secondary school children are more willing to extend their journey by a longer amount of time - by between 10 and 20 minutes. However, personal safety is a significant additional concern for teenagers.<sup>64</sup> The safety and attractiveness of the route and the road environment can make a big impact on the decision about whether or not to walk. Simple improvements to the public realm such as clearing litter and improving green spaces have multiple benefits, encouraging more people to use areas, which in turn can make them feel safer.<sup>65</sup>



## ROAD SAFETY

Children are vulnerable around roads. They are still developing their cognitive and physical functions and do not have the same capacity as adults to assess risk and cope in different traffic situations and may be unable to see past obstacles or assess speed.<sup>66</sup> In London, most road injuries affecting children are as pedestrians. Nearly 2,000 children in London were injured in road traffic collisions in 2015, including 142 serious injuries.<sup>67</sup> Five children died due to road traffic injuries. Children from poor communities are more likely to be involved in a fatal collision.<sup>68</sup>

As pedestrians, small children are less visible to drivers, and may find it more difficult to judge when to cross a road safely. TfL data shows that most all child pedestrian casualties on the journey to school were injured close to a pedestrian crossing (35%) or close to a junction (63%).<sup>69</sup> Less than half of child pedestrian casualties are injured on the school journey. Collisions involving children on the school journey peak in spring and autumn, mostly in daylight and more often in the afternoon rather than in the morning. However, collisions involving child cyclist and car passenger casualties in London are more likely to happen during the morning journey to school. Parents rushing or

parking inconsiderately on the school run can be a major hazard, and can create conflicts between pedestrians and vehicles. Lowering speeds is a proven way to save lives. Almost no child pedestrians or child cyclists were recorded as having been injured in a 20mph zone.<sup>69</sup>

The design of streets around schools needs to reduce conflicts, reducing speeds and separating vehicles from walking and cycling areas. Speed limits and separate parking and walking zones can help. High speed roads, and ones that are difficult to cross, create 'severance', affecting people's decision about whether they want to walk or cycle even short distances. Ensuring safe places for children to play away from traffic can also reduce exposure to risk of road injuries.<sup>70</sup>

Road casualty figures in London are, however, the lowest for 30 years, and there has been a 42% reduction in deaths and serious injuries in less than 10 years.<sup>69</sup> The challenge is to continue this trend while also increasing walking and cycling. International evidence suggests that where greater numbers of people walk and cycle, the risk decreases. For example, in the Netherlands which has implemented a range of policies to encourage people to walk and cycle, bicycle use has increased and risk of a collision has reduced.<sup>71</sup>





### THE NEED FOR CITIES TO BE DESIGNED FOR CHILDREN

At the heart of safe and healthy journeys lies the question 'what kind of city are we making for our children?' Is it one where children feel safe to explore and learn independence, or one where children have to be protected? UNICEF has sought to define what this could mean, in the context of the Convention on the Rights of the Child (CRC), by creating a framework for building 'Child Friendly Cities'. This explores the processes for including children in decision making and ensuring that the perspective of children is considered. Among other characteristics, they suggest that a Child Friendly City would guarantee the right of every young citizen to:

- Walk safely in the streets on their own
- Meet friends and play
- Have green spaces for plants and animals
- Live in an unpolluted environment <sup>72</sup>

There is also a growing movement of play practitioners, educators and urban planners who argue for designing streets with children in mind. Many draw on the work of Finnish academic Marketta Kytta who characterises 'child friendliness' in terms of the types of the relationship between the variety of experiences on offer in a neighbourhood, and the ability to independently access them.<sup>73</sup> Kytta argues that fundamentally, routes to and from school must be safe, but they can go beyond this to provide fulfilling and enjoyable experiences. The way streets and public spaces are designed can enable children to connect with nature, or instigate independent play or creativity. This can be as simple as walking along a low wall.

Tackling air pollution and making cities safe for walking and cycling can also help to improve the environment and contribute to a more sustainable city. The UN Committee on the Rights of the Child recommend that this could include "creating zones with priority for pedestrians or cyclists over motorised traffic in roads of family housing or play streets outside schools; inclusive parks and playgrounds; access to landscaped green areas, open spaces, 'wildlands' or nature; and overall greater 'walkability'."<sup>74</sup>



*“Independent mobility is an essential characteristic of a truly child-friendly environment... (with) possibilities that personally are intriguing and exciting for them.”<sup>74a</sup>*

**Marketta Kytta**  
Professor of Land Use Planning  
Aalto University

### WIDER BENEFITS OF ACTIVE AND ZERO-EMISSION TRAVEL

Walking and cycling also have wider benefits, helping to bring communities together by helping develop a sense of shared identity and opportunities to connect with neighbours. There are also generational impacts - the evidence suggests that children who walk and cycle are more likely to become adults who do the same.<sup>75</sup>

Reducing air pollution by reducing the amount of motorised travel, and switching to electric vehicles powered by renewable energy will also reduce levels of carbon dioxide and black carbon that contribute to climate change. This is a win-win for people and the planet. One of the most practical ways of doing this is to focus on the future of our children, and the world they are growing into.



*“Telling people that they might possibly save the Earth from distant and uncertain harm is not a great way to convince them to support a particular policy. But what happens when you tell people they can definitely, right now, reduce the number of asthma attacks suffered by children, save their own families and friends from respiratory disease, cut their own energy bills, make it easier for them to get around town, improve their quality of life, increase the number of jobs in their community, and strengthen our national energy security - all while increasing the long-term stability of the global climate? Now that's a different story. And it's our story too.”<sup>76</sup>*

**Michael Bloomberg**  
Former Mayor of New York

### KEY FACTS : ENABLING SAFE AND HEALTHY JOURNEYS TO SCHOOL

- One in five car journeys in the morning rush hour are taking children to school. Switching to walking and cycling could therefore significantly reduce emissions.
- Eight out of ten children in London do not get the recommended amount of exercise each day. Walking to school would help to address this. Physical activity is positively related to academic performance, and alertness and concentration in lessons. The benefits of exercise outweigh any potential harm from air pollution in nearly all situations.
- Walking along streets with lower levels of traffic, such as quieter backstreets can cut exposure to air pollution in half.
- Lowering speeds is a proven way to save lives. Almost no child pedestrians or child cyclists in London have been injured in a 20mph zone.
- Child friendly cities allow children to: walk safely on their own; meet friends and play; have green spaces for plants and animals; and live in an unpolluted environment.

# PART THREE



## INSTITUTIONAL RESPONSIBILITIES FOR SAFE & HEALTHY ROUTES TO SCHOOL IN LONDON

Creating safe and healthy routes to school requires concerted and coordinated action between international, national and local stakeholders and should include the perspective of children in decision-making. We all share this responsibility.

The Mayor of London, Sadiq Khan, has made improving air quality across the city a major priority, particularly for those most at risk such as children. It is an issue that is personal to him, having developed adult-onset asthma himself - but also one that affects the lives of thousands of Londoners daily.<sup>77</sup>



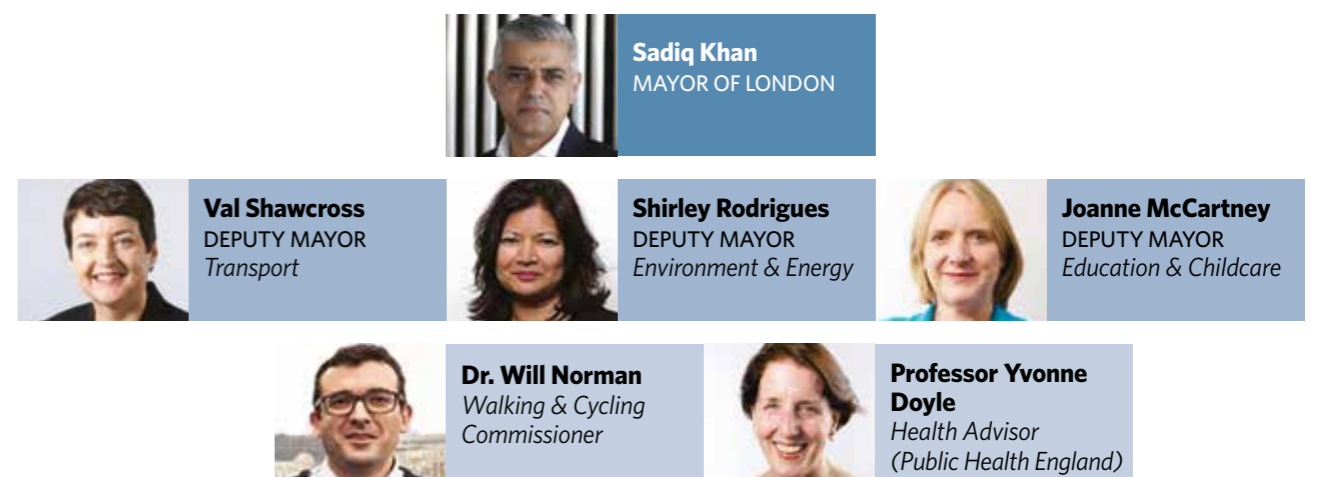
“ I won't be satisfied until London is one of the world's greenest cities - one which other cities across the world look to for leadership on cleaning up our dangerously polluted air, on green energy, sustainability and on tackling climate change. For me it's personal. I've lived in London all my life. I've never smoked. I'm fairly fit and even managed to run the London Marathon a few years back. But in recent years I've been diagnosed with adult-onset asthma.”

**Sadiq Khan**  
Mayor of London

The Mayor's team includes Deputy Mayors for Transport, the Environment and Energy, and Education. In addition, he has a special commissioner working with Transport for London on walking and cycling, and receives specialist health advice from the London Regional Director of Public Health England (see Figure 3).<sup>78</sup> This team of advisers and advocates are responsible for delivering the Mayor's vision, and the economic, environmental and health benefits.

London's air quality is in part shaped by national and international policy. The overarching policy frameworks affecting vehicle emissions and air pollution in London are set by the UK government and the European Union. Air quality policy has been shaped by European Directives, which set legal limits for pollutants.<sup>79</sup> The EU also set regulations on vehicle emissions regulations and the testing regime for vehicles.

FIGURE 3: LEADERSHIP FOR SAFE AND HEALTHY ROUTES TO SCHOOL

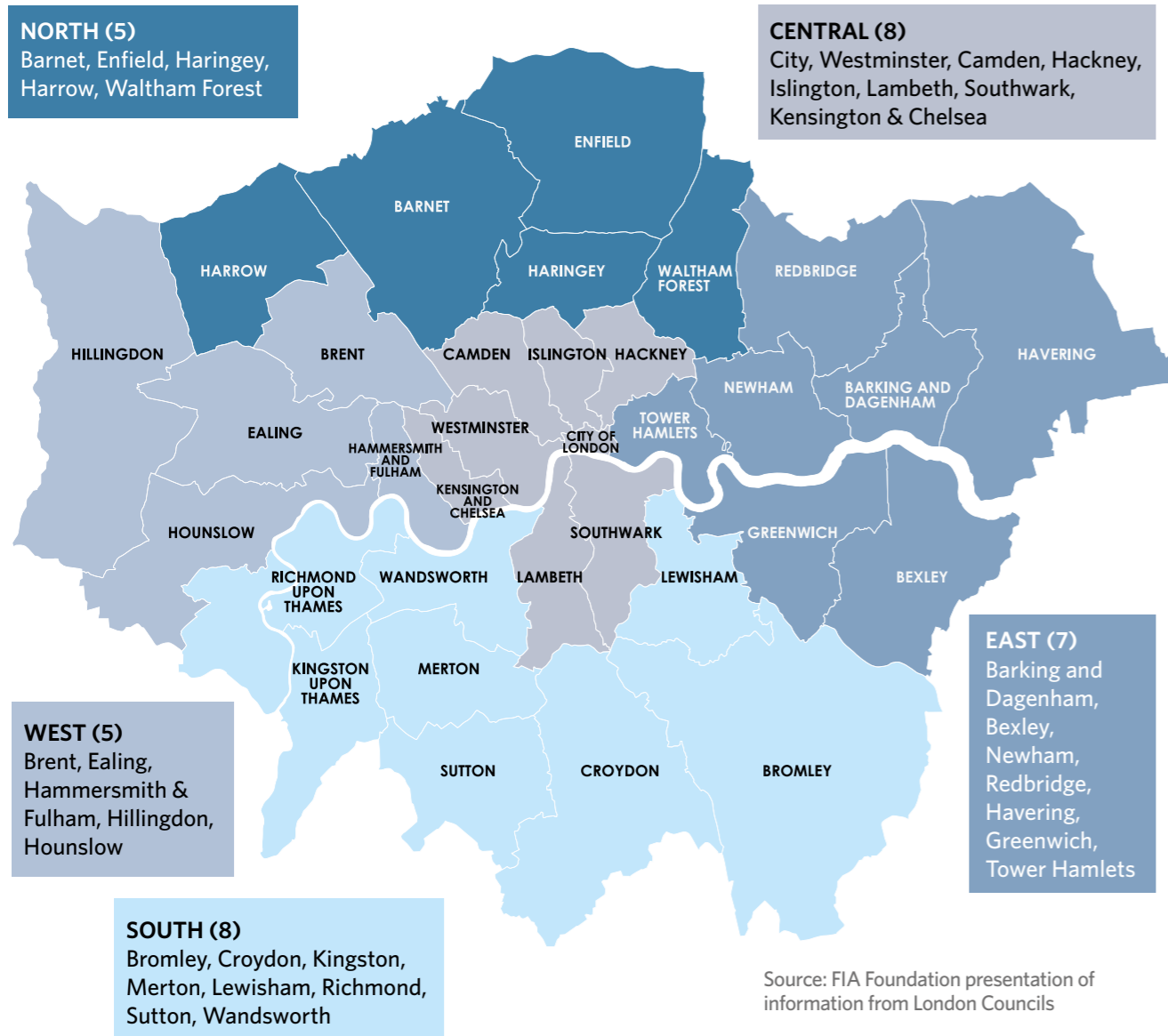


## THE ROLE OF LOCAL AUTHORITIES

In London there are several different levels of government. London's 33 local authorities (32 councils, known as boroughs, and the City of London

Corporation) have primary responsibility for the most schools and roads and planning decisions, as well as local responsibility for local air quality. However, this is in the context of policies and funding priorities directed by the UK government and the Mayor of London.

FIGURE 4: AIR QUALITY CLUSTER GROUPS (5 REGIONAL + STEERING GROUP)



The Mayor of London has responsibility for public transport through Transport for London and sets policy priorities around issues such as sustainable transport, and the environment which are directed through funding allocations to boroughs. These are carried out within the framework set out by national policy – including the Department of Health and Public Health England – which provides local advice and guidance. For example health guidance from Public Health England suggests

that schools should not be sited in areas where pollution levels will be high.<sup>80</sup> The Mayor's business plan commits £2.1bn to creating Healthy Streets by 2021/22, including spending on walking, cycling and improving road safety, public spaces and air quality.<sup>81</sup> As figure 4 shows, London Councils work in clusters to address air quality issues.

The Mayor's transport strategy sets out his plans for prioritising air pollution and health, saying that "London's



future must be planned around active and inter-connected lives".<sup>82</sup> In his foreword he says "Transport is a cornerstone of my vision for a fairer, greener, healthier and more prosperous city."<sup>83</sup>

Boroughs apply for funding from the Mayor to improve their transport networks as part of a Local Implementation Plan (LIP), which sets out how they intend to implement the Mayor's Transport Strategy within the borough.<sup>84</sup> They can also apply for specific

schemes, such as the Mayor's Air Quality Fund. They also supplement this funding with money from other sources, such as CIL (Community Infrastructure Levy) a fee charged by councils to developers to help pay for local facilities and community services.

Local councils are required through national legislation to monitor air quality and identify management areas (Air Quality Management Areas), produce action plans and update reports to show how they are going to try to meet air quality objectives. However, although guidance suggests that they should take into account vulnerable populations in determining the location of monitoring sites, analysis by the British Lung Foundation has found that less than half of Councils across the UK locate monitoring sites within 10m of a school.<sup>85</sup>

In London, the Mayor's Local Air Quality Management Framework provides the framework for the local authority monitoring regime.<sup>86</sup> In order to incentivise councils to go beyond just compliance, boroughs can earn Cleaner Air Borough (CAB) status if they submit their Annual Status Reports on time and demonstrate that they are showing leadership and raising awareness. Approximately two thirds of boroughs received the accreditation in 2017, the first year of the scheme.<sup>87</sup>

Boroughs are responsible for local planning decisions around infrastructure. They are also responsible for ensuring new developments meet approved policies and are appropriate.

## SCHOOL TRAVEL

Department for Education guidance makes it clear that local authorities are responsible for promoting sustainable travel. As part of this, local authorities must assess the travel needs of children and young people, audit infrastructure around schools, and publish a 'Sustainable Modes of Travel Strategy'. In London, Transport for London guidance states that all new school developments must have a school travel plan, by which the school sets out how it promotes sustainable travel.<sup>88</sup>

Safe school travel is also recognised in the London Plan. Recent supplementary planning guidance states: "To enable children and young people to live healthy and active lives, they should grow up in high quality environments that are safe and offer them access to opportunities to participate in physical activities that are appropriate for their age and stage of development. These environments should include Transport: safe routes for active travel to school, safe routes to parks and play space."<sup>89</sup>



## A BROAD COALITION FIGHTING FOR CLEAN AIR

Many different groups have been campaigning for the issue of air pollution to be given greater priority by government, including health professionals, environmental organisations and sustainable travel campaigners. Examples are:

- The Clean Air in London campaign<sup>90</sup>, led by Simon Birkett, has for over a decade sought to engage politicians with the issues, including the House of Commons Environmental Audit committee, which has highlighted the issue through a series of reports since 2010.<sup>91</sup>
- The environmental law organisation ClientEarth, have repeatedly taken the UK government to court for their failure to take 'immediate action' to reduce levels of air pollution in line with the EU limits. Both the Supreme Court and High Court have ruled that the government needed to take further action.



- The Healthy Air coalition draws together many of the leading organisations campaigning on air pollution in the UK, to raise the profile of the issues and build a collective voice.<sup>92</sup> This includes health experts, including doctors, as well as environmental and other groups.
- Greenpeace, climbed the iconic Nelson's column in Trafalgar Square to put a facemask on the statue that looks down the road to Parliament to raise awareness of the issues, as well as co-ordinating a letter signed by one hundred London head teachers asking the Mayor to protect London's children.<sup>93</sup>
- Campaigners are also calling for a new Clean Air Act to tackle the UK's pollution 'crisis'. The coalition calling for this includes ClientEarth, the British Lung Foundation, Medact, Greenpeace, Campaign for Better Transport, Sustrans, and Friends of the Earth.



- Many other stakeholders, including urban designers and architects, children's play campaigners and business improvement districts are part of a wider movement promoting liveable cities. The engineering firm Arup have released reports as part of their 'Cities Alive' series focusing on walkable streets, and have begun research looking at how the planning and design of child-friendly cities can have benefits for all.<sup>94</sup>
- Across London, Business Improvement Districts have also sought ways to making their areas more attractive for people to spend time, knowing that increasing the attractiveness and walkability of an area increases footfall (or foot traffic) and potential business for shops and cafes.<sup>95</sup>



*“ The air in London is lethal and I will not stand by and do nothing. Now I urge the Government to step up and match my ambition to transform the appalling air we breathe. Ministers need to deliver a national vehicle scrappage fund, reform fiscal incentives like vehicle excise duty and pass a powerful new Clean Air Act to Act end the toxic smog in London once and for all.”*<sup>96</sup>

**Sadiq Khan**  
Mayor of London

### KEY FACTS : INSTITUTIONAL RESPONSIBILITIES FOR SAFE & HEALTHY JOURNEYS TO SCHOOL IN LONDON

- The Mayor of London has made tackling air pollution a key priority. The Mayor's business plan commits £2.1bn to creating Healthy Streets by 2021/22, including spending on walking, cycling and improving road safety, public spaces and air quality.
- London's local authorities have primary responsibility for the most schools and roads and planning decisions, as well as local responsibility for local air quality.
- Local authorities are also responsible for promoting sustainable travel. As part of this, they must assess the travel needs of children and young people, audit infrastructure around schools, and publish a 'Sustainable Modes of Travel Strategy'.
- Many different groups have been campaigning for the issue of air pollution to be taken seriously by government, including health professionals, environmental organisations and sustainable travel campaigners. Courts have ruled that the UK government must do more to cut air pollution.



## PART FOUR



## A CASE STUDY: ACTION FOR CLEAN AIR AND HEALTHY ROUTES TO SCHOOL IN LONDON

London provides a case study of a global city working to address poor air quality. This research reveals insights both into the challenges and the opportunities for making streets safer and healthier for children. In total, the Mayor's business plan commits £875m to improving the quality of the capital's air by 2021/22.<sup>81</sup> London is taking a range of actions:

- Reducing vehicle emissions
- Improving evidence and awareness
- Local interventions to create safer, healthier routes to school

### A) LONDON'S EXPERIENCE OF REDUCING VEHICLE EMISSIONS

This section explores the range of actions London is taking to reduce emissions from vehicles:

- Vehicle restrictions and road pricing by vehicle emissions, including:
  - Congestion Charge;
  - Low Emissions Zone;
  - T-Charge and Ultra Low Emissions Zone (ULEZ)
- Support for ultra-low emission and zero emission vehicles
- Anti-idling volunteers

#### 1 VEHICLE RESTRICTIONS AND ROAD PRICING BY VEHICLE EMISSIONS

##### CONGESTION CHARGE

Introduced in 2003, the Congestion Charge covers the area within the inner ring road of central London.

The charge, originally £5 per day per vehicle but now set at £11.50, allows for exemptions for low emission vehicles. The scheme has been progressively adapted over time in line with the latest technologies. There are also currently other exemptions, including a 90% discount for residents of the zone, and a full exemption for taxis and private hire vehicles.<sup>97</sup> Between 2007 and 2010 the Congestion Charge also covered parts of west London until this section was revoked by Mayor Boris Johnson in response to concerns about its impact on local businesses.<sup>98</sup> By 2013 the Congestion Charge had reduced traffic volumes by 10% and generated £2.6 billion of revenues, which are reinvested in transport improvements. Emissions of particle matter and NO<sub>x</sub> fell by over 10% in the first year, but have increased steadily since.<sup>99</sup>

##### LOW EMISSIONS ZONE

Since 2008 London has also had a Low Emissions Zone, which covers a far larger area of Greater London than

the Congestion Charge zone. This aims to remove the most polluting heavy diesel vehicles from the roads. However, although the zone resulted in fewer old vehicles entering London, it has not had the expected impact on reducing air pollution, in part due to the failure to reduce real-world NO<sub>x</sub> emissions and because of delays in implementing the scheme.<sup>100 101</sup>

##### T-CHARGE AND ULTRA LOW EMISSIONS ZONE (ULEZ)

Recognising the need to go further to reduce emissions, the Ultra Low Emissions Zone (ULEZ) aims to reduce emissions by restricting access to older, more polluting vehicles. Plans for the ULEZ were first put together in 2014. A new charge for the most polluting vehicles entering central London from September 2020, it would apply to cars, motorcycles, vans, minibuses, buses, coaches and heavy goods vehicles (HGVs).

Mayor Sadiq Khan has gone further, announcing a new toxicity charge (T-charge) for the most polluting vehicles entering the Congestion Charge Zone starting in October 2017. He has also brought forward the start date of the ULEZ to 2019 as well as consulting on plans to extend it beyond the current central area.<sup>102</sup>

## 2 SUPPORT FOR ULTRA-LOW AND ZERO EMISSION VEHICLES

The Mayor has also introduced a series of measures to promote low emission vehicles. This includes new 'Low Emission Bus Zones', which are routes in heavily polluted areas where only the cleanest buses will run. London has

also committed to procuring only hybrid or zero-emission double-decker buses from 2018. The Mayor's draft Environment Strategy sets out a timeline for all buses to be zero emission by 2037<sup>103</sup> (see Figure 5 below).

FIGURE 5: STRATEGY FOR LOW-EMISSION BUSES

	NOW	2020	2025	2030	2035	2037
<b>Bus procurement &amp; retrofit</b>	Retrofit of existing double decks to Euro 6 standards TfL will buy only electric or hydrogen double decks	TfL will buy only electric or hydrogen single decks	TfL will buy only electric or hydrogen double decks			
<b>Bus Fleet in Central London</b>		All single decks electric or hydrogen				All TfL buses electric or hydrogen
		All double decks Euro 6 & Hybrid			80% of double decks electric or hydrogen	
<b>Bus Fleet in inner &amp; outer London</b>			50% of single decks electric or hydrogen	90% of single decks electric or hydrogen	All single decks electric or hydrogen	
		All double decks meet Euro 6 standard as minimum	More than 85% of double decks hybrid, electric or hydrogen	60% of double decks hybrid; 40% electric or hydrogen	20% of double decks hybrid; 80% electric or hydrogen	

Source: TfL London Environment Strategy

From 1 January 2018, all taxis presented for licensing for the first time will need to be zero emission capable (defined as CO2 emissions of no more than 50g/km and a minimum 30 mile zero emission range), while for private hire vehicles, this date is 2020 – this applies to the whole of London, not just the ULEZ area.<sup>104</sup>

The Mayor is also supporting new infrastructure for ultra-low emission vehicles, such as electric charging stations, as part of funding for 'Neighbourhoods of the Future'. Six neighbourhoods (Hammersmith and Fulham, Heathrow, City Fringe, Harrow, Haringey, and Croydon and Sutton)

are being given funding of £1.4m for this investment, which is being matched by £1.1m from the nine local boroughs involved.<sup>105</sup>

The Mayor's draft transport strategy also outlines some further steps for boroughs "to take targeted action and fulfil their statutory duties, including using tools such as road charges, differential parking charges, street closures and vehicle restrictions, tackling engine idling, promoting efficient driving, implementing electric vehicle charging infrastructure, and supporting zero emission car clubs (where appropriate)."<sup>106</sup>

## 3 'ANTI-IDLING' VOLUNTEERS

Official UK health guidance recommends introducing by-laws and taking other actions to support 'no vehicle idling' areas, particularly where vulnerable groups congregate, such as schools.<sup>107</sup> Across London, councils are training volunteers to remind drivers to switch off their engines when they are stationary for more than 60 seconds. The City of London Corporation, funded by the Mayor's Air Quality Fund, has trained a team of volunteer 'Air Quality Wardens' to talk to drivers who leave their engines running unnecessarily. The wardens explain

the harm that leaving engines running does to local air quality and use a "myth-busting" guide to educate drivers. Drivers who fail to turn off their engines after being warned can be issued with a £20 fine.<sup>108</sup> The Mayor's Air Quality Fund is supporting other Councils to train anti-idling volunteers, such as the Borough of Camden, which is particularly targeting reducing 'idling' outside schools.<sup>109</sup> Some schools include anti-idling messages in their awareness raising activities with pupils and communications with parents.

## B) IMPROVING EVIDENCE AND AWARENESS

Accurate information is vital to raise awareness about air pollution, and also to put in place measures to reduce exposure, particularly for children. London is supporting:

- Air quality monitoring, information and alerts
- Revealing real-world vehicle emissions: TRUE - The Real Urban Emissions Initiative [www.trueinitiative.org](http://www.trueinitiative.org)
- Air quality audits
- Mapping low pollution routes
- Citizen science and air pollution awareness in schools

### 1 AIR QUALITY MONITORING, INFORMATION AND ALERTS

London has one of the most developed air quality monitoring networks anywhere in the world. The London Air Quality Network is co-ordinated by experts from King's College London.<sup>110</sup> Real-time information is used to provide updates about levels of air pollution to assist people to make informed choices about how to travel around the city. Since 2016, the Mayor has

also issued alerts through information boards at bus stops, tube stations and roadsides during episodes of pollution which reach 'high' or 'very high' levels. The messages advise people with lung or heart problems to avoid strenuous physical activity. In addition, the City Air app helps users find low air pollution routes, for example taking back streets rather than main roads.<sup>111</sup>

### CLEAN AIR DAY

Global Action Plan launched the UK's first 'Clean Air Day' in June 2017, with the aim of raising awareness and providing accurate information and advice to people

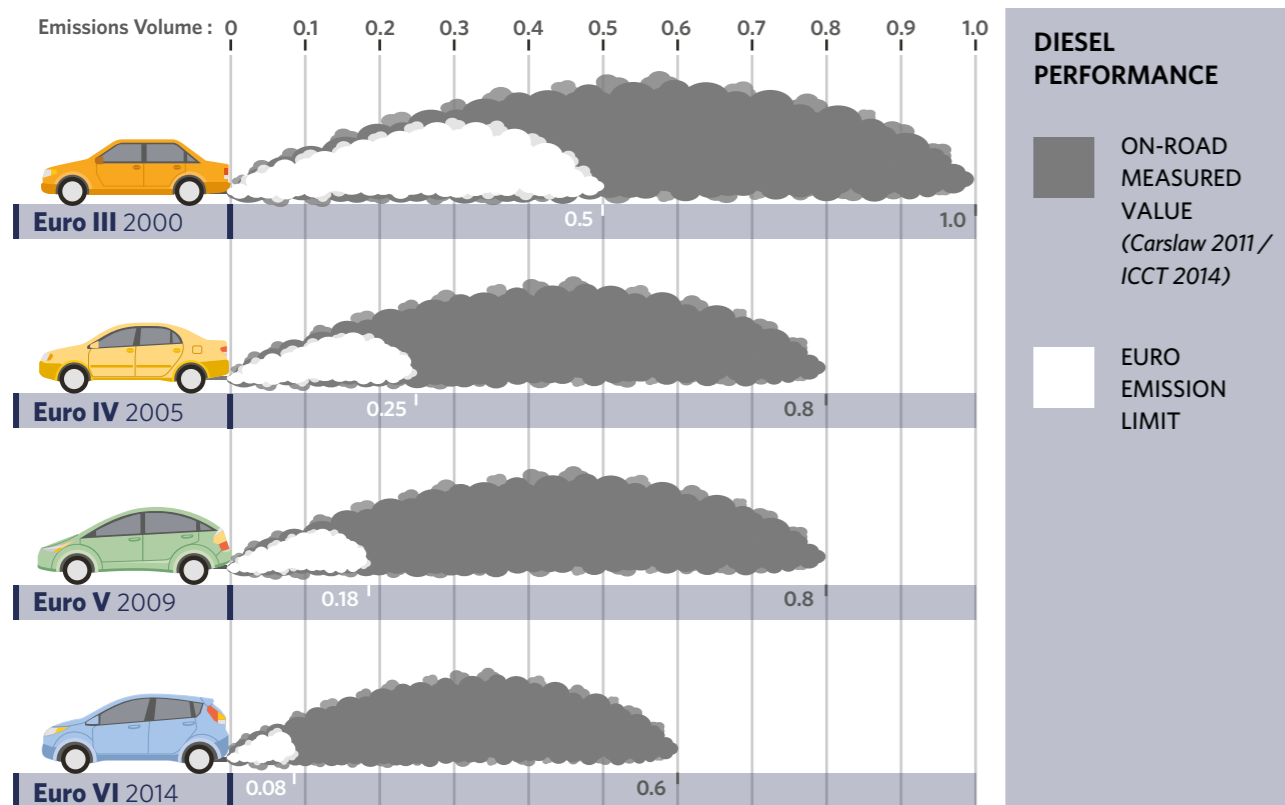
about how to limit their exposure to air pollution. This involves a range of activities across the UK and resources for schools, businesses and the local community.<sup>112</sup>

### 2 REVEALING REAL-WORLD VEHICLE EMISSIONS: TRUE

One of the main reasons that air quality has failed to improve in London over the past decade, is the failure of vehicle standards and testing to certify vehicles accurately. At the national level, UK government policy has used taxation to promote greater fuel efficiency and lower carbon emissions by encouraging a shift to diesel vehicles. At the same time, however, projected improvements in engine and exhaust technology have not been realised. While new generations of diesel vehicles were meant to have lower NO<sub>x</sub> emissions – the reality in many cases was the opposite, and meanwhile the number of diesel vehicles increased. Currently, cars only have to pass Euro standards emissions testing, which is limited to laboratory tests and had been proven to be unrealistic in real-world conditions. As the 'dieselgate' scandal exposed, some vehicles were effectively cheating the system to appear to have low levels of emissions in tests, but having far higher real on-road emissions (see Figure 6 overleaf).<sup>113</sup>



**FIGURE 6: PERFORMANCE OF DIESEL**



Source: FIA Foundation presentation of ICCT analysis

Research by the International Council on Clean Transportation (ICCT) estimates that globally, the ‘excess emissions’ caused by illegal and unreported nitrogen oxide emissions from diesel cars, trucks and buses caused 38,000 premature deaths around the world in 2015. Without action, this number would grow to 180,000 in 2040 (see Figure 6 above).<sup>114</sup>

TRUE is a partnership of several organisations including the FIA Foundation, Transport and Environment, Global NCAP, and ICCT who broke the ‘dieselgate’ scandal. At the launch, Mayor Hidalgo of Paris called the initiative “a truly innovative study of the true emissions of vehicles” and emphasised the importance of transparency for public trust.<sup>115</sup>

In Paris in March 2017, the Mayor of London, together with the Mayor of Paris, announced at a joint press conference plans to become engaged in a new initiative to help provide robust and independent data on vehicle emissions. The TRUE [www.trueinitiative.org](http://www.trueinitiative.org) initiative, will provide accurate information on the real-world emissions of thousands of vehicles in each city, including through remote sensing.

This data will be used in many ways, including to help inform the purchasing decisions of those looking to replace their car. In London, for example, vehicles whose emissions have been measured by TRUE will be given a ‘score’ based on their emissions, which will be available through a special website for consumers to access and inform their decisions on which vehicle to purchase.



### 3 AIR QUALITY AUDITS

The Mayor’s draft Environment Strategy includes a commitment that “The Mayor will aim to do more to protect London’s schoolchildren by reducing their exposure to poor air quality at school and on their journey to and from school.”<sup>116</sup>

The Mayor has committed £250,000 to fund 50 new school ‘air quality audits’ across London. The detailed audit, carried out by an experienced transport and environment consultancy, will review ways to

dramatically lower emissions and exposure to pollution in and around the school. The audits will highlight key interventions to reduce exposure and will run alongside a pollution awareness-raising education programme at each school, and it will also recommend interventions.

The intention is that boroughs will implement the recommendations from the audits through their Local Implementation Plans (LIPs).

### 4 MAPPING LOW POLLUTION ROUTES

Creating maps to identify clean routes to school is an engaging, visual way to help people reduce their exposure to air pollution. For schools, this can be a simple activity to undertake with children.

In central London, many Business Improvement Districts have sought to improve walkability of their areas, and are using technology to promote attractive and low emission routes. Some are using technology to support this. The Green Pathways App highlights opportunities to walk through local green spaces near London Bridge,<sup>117</sup> and the Cross River partnership which has established a backstreet walking route between London Euston and King’s Cross stations, which avoids the most polluted roads.<sup>118</sup> At Bart’s hospital, over a thousand pregnant women have been given advice about walking quiet routes away from busy roads to improve the health of their unborn child.<sup>119</sup>



### 5 CITIZEN SCIENCE AND AIR POLLUTION AWARENESS IN SCHOOLS

The Mayor’s Air Quality Fund has also supported a number of initiatives across many London boroughs which work with schools to raise awareness of air pollution and empower pupils to take action.

In Haringey, the council developed an “Air Monsters” theme to raise awareness with in local schools. This involved characters to provide a visual stimulus to represent the different pollutants through pop-up banners of each “Air Monster”, and a fourth character, the “Zero Hero”, who promotes walking, scooting, cycling, and using public transport. Children drew pictures of monsters in art lessons, whilst other lessons explored the science of air pollution.<sup>120</sup>

In Islington, the council organised an awareness raising event with Sustrans and the European Lung Foundation. Pupils from three primary schools took part in a session that included testing their own lung function on specialised devices in a ‘clean air bubble’. The devices allow people to see how their lung performance measures up, prompting them to think about the effect of pollution and the importance of keeping their lungs as healthy as possible.<sup>121</sup>

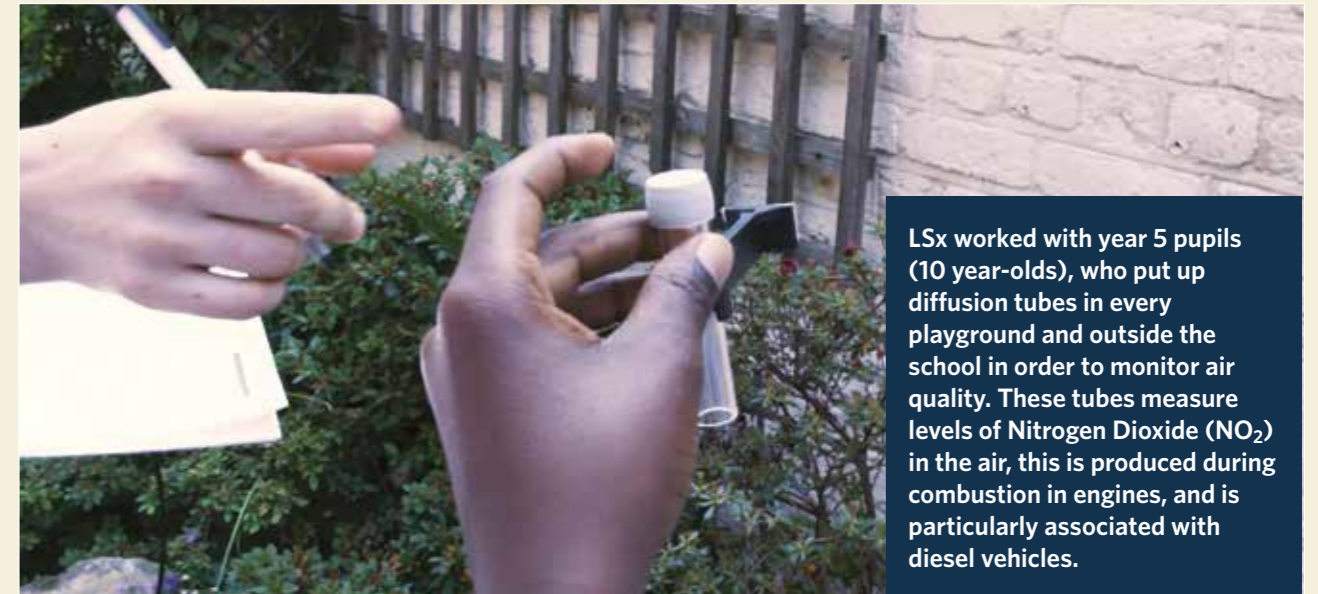
In south London, councils have worked together to provide information about air quality.<sup>122</sup> They have also supported work in schools, based on the London Sustainability Exchange Clean Air 4 Schools toolkit.

**CLEANER AIR4SCHOOLS TOOLKIT: HELPING CHILDREN UNDERSTAND AIR POLLUTION**

The London Sustainability Exchange (LSx) Cleaner Air4Schools toolkit<sup>123</sup> combines education and citizen science with travel planning to help children understand the levels of air pollution around their schools, and the steps they can take to avoid it, such as by taking alternative routes. This participatory approach encourages peer learning and investigation, including using diffusion tubes to measure nitrogen dioxide levels in the areas around schools.

The toolkit has been used extensively in London and across the UK to help schools engage with air pollution. The FIA Foundation is supporting a refresh of the toolkit, and its use in schools in Nairobi, Kenya, and Delhi, India to enable them to exchange their experiences. Implementing partners, UN Environment and Clean Air Asia are drawing on their local

knowledge and experience to adapt the toolkit. The aim is to highlight the similarities and differences between cities, and to stimulate cross-cultural learning and exchange of ideas and solutions and to raise awareness.



LSx worked with year 5 pupils (10 year-olds), who put up diffusion tubes in every playground and outside the school in order to monitor air quality. These tubes measure levels of Nitrogen Dioxide (NO<sub>2</sub>) in the air, this is produced during combustion in engines, and is particularly associated with diesel vehicles.

**TOWNSEND SCHOOL**

Townsend school is a state school for boys and girls aged from 3 to 11, in the London borough of Southwark.

The school took part in a three-way partnership with schools in Nairobi and Delhi to learn together about air pollution by using LSx's CleanerAir4schools toolkit.



The diffusion tubes and citizen science approach gives power to the children to understand what is going on in their own neighbourhoods.



The school is very close to the A2, the Old Kent Road, where air quality regularly exceeds guideline limits. According to the London Air Quality Network the annual average in 2016 was three times EU limits.



This fun and educational programme is designed to teach children and parents about air pollution and share actions that they can take. The children learn about air pollution in an assembly, engage in citizen-science, and have the opportunity to become 'air quality champions'.



Working with schools in other countries also helps them realise that it isn't just a local problem, and has helped them to engage on the issue of air pollution.

## C) LOCAL INTERVENTIONS TO CREATE SAFER, HEALTHIER ROUTES TO SCHOOL

Interventions to support walking and cycling have the potential to reduce emissions and improve air quality, as well as improving the streets for everyone. It takes leadership and vision to bring about change. London has significant plans to improve streets and support safe and healthy routes to school, through:

- Healthy streets
- Community street design
- Safer roads
  - Vision Zero
  - 20mph zones
  - School Crossing Patrols
- Promoting sustainable and active travel
  - STARS and Healthy Schools
- Local vehicle restrictions around schools
- Green walls to block and absorb pollution



“ A walking city is a transit city is a cycling city. Streets that fail for one fail for all. Active, safe London streets are healthy streets.”<sup>124</sup>

**Janette Sadik-Khan**  
former transport commissioner of New York

### 1 HEALTHY STREETS

The 'Healthy Streets approach' is at the centre of the Mayor's draft transport strategy, and aims to encourage Londoners to get more physically active and to reduce the volume and dominance of motor traffic. The Healthy Streets for London report highlights how "streets and places provide important opportunities for children to get the activity they need through travel and play".<sup>125</sup>

#### ASSESSING HEALTHY STREETS

By taking the Healthy Streets Approach all decisions made by TfL will be aligned to delivering improvements against the 10 Healthy Streets Indicators.

These indications are evidence-based characteristics of streets that encourage active travel, improve health and wellbeing and reduce inequalities (see Figure 7 opposite).

Transport for London's business plan commits £2.1bn to creating Healthy Streets by 2021/22, focusing on walking, cycling and improving road safety, public spaces and air quality.<sup>126</sup> Funding will be used in many different

locations across London, many of which will include routes that children take to school. TfL has also announced a small 'healthy routes' programme which aims to create healthier routes to schools and other local attractions. The Mayor's draft transport strategy also includes reference to street closures and car-free days, as well as a 'Liveable Neighbourhoods' programme of local measures to address pollution at local air quality hotspots and around schools. It also commits to increasing the number of street trees by 1% each year between 2016 and 2025.<sup>127</sup>

The Healthy Streets Approach aims to be a long-term plan to improve the experience of walking around the city, and help everyone be more active. It will be overseen by the TfL Board. TfL is developing a range of tools to support delivery of the Healthy Streets Approach including a new 'Healthy Streets Check' to be applied to detailed designs of changes to street layouts.

The 'Healthy Streets check' aims to systematically measure different attributes in a way that is comparable between locations. It rates roads using around 50 metrics

FIGURE 7: THE HEALTHY STREETS APPROACH



Source: Lucy Saunders

mapped onto the 10 'Healthy Streets Indicators'. Transport for London has also developed a 'Healthy Streets survey' which measures people's perceptions on-street by asking a 5 to 10 minute survey about their experiences.

#### SUPPORT FOR CYCLING INFRASTRUCTURE

In recent years, London has shown a strong commitment to improving infrastructure for cycling. This includes introducing a cycle-hire network across central London in 2010, as well as a network of Cycle Superhighways and 'quietways', and focused interventions to promote cycling in three boroughs (Enfield, Kingston and Waltham Forest) - known as 'mini-Hollands'.<sup>128</sup> This has supported increased cycling, particularly in central London - although rates around schools are still relatively low.

Analysis for TfL suggests that new Cycle Superhighway corridors (East-West and North-South) are more efficient use of road space, as they are carrying 46% of the people travelling along the routes, despite occupying only 30% of the road space.<sup>129</sup> While the superhighways may be more likely to be used by commuters, quietways offer a more local network of routes for parents and children.

The Mayor's new business plan increases the funding for cycling to £154 million a year, almost doubling previous levels - and will total an average of £17 per head per annum, and constitute 5.5% of Transport for London's budget.<sup>130</sup>

## 2 COMMUNITY STREET DESIGN

Making roads safer around schools contributes to safe and healthy routes and encourages walking. The charity Sustrans has a programme of community street design outside schools to improve safety and prioritise non-motorised transport. This includes creative interventions, such as new planters with flowers and trees on the roads outside schools, and using coloured paint on the road to indicate pedestrian crossings. In Lambeth, Sustrans

changed the road layout, introducing painted dots and non-standard surfaces on the carriageway to create visual markers for traffic calming. As part of the changes, 13 new trees were planted to create an improved streetscape which is more attractive to walk along and much safer for pedestrians.<sup>131</sup> A key part of this approach is to involve children in the design process and engage the community to transform the way that streets are perceived.

### SUSTRANS IN LAMBETH

In the borough of Lambeth, south London, the charity, Sustrans designed an active trail map, as part of a wider project to encourage safe walking and cycling to a school in Lambeth, with three trails, each themed with a colour and animal (see Figure 8 opposite). The trail is marked by signs on lampposts, which also include engaging questions for children to consider – for example ‘What do the clouds look like? Are they different from yesterday?’ Sustrans also worked together with the school pupils and a local artist to create a new mural on a wall in a local park on the route of one of the trails in order to make it a more welcoming and fun route to take. The map and trails also identify a safe park and walk zone. These measures have reduced traffic volumes by 44% in a year, with more vehicles travelling at 10-15mph.<sup>132</sup>



FIGURE 8: SCHOOL ACTIVE TRAIL MAP



## 3 SAFER ROADS



“ Every child has a right to use our roads and streets without fear of injury from traffic. Providing a safe environment for children to go to school, play and explore their world must be a priority. ”<sup>132a</sup>

**Rt. Hon. Lord Robertson of Port Ellen**  
Chairman, FIA Foundation

### VISION ZERO

Globally, road injuries were the leading cause of adolescent death among 10-19 year olds in 2015.<sup>133</sup> In London, although levels of death and injury are far lower

than many developing countries, risks remain. The majority of pedestrian casualties occur in built up areas.<sup>134</sup> London has committed to ‘Vision Zero’, which emphasises the role that road design can play in minimising the risk of injury, as part of creating a ‘safe system’.<sup>135</sup>

## THE SAFE SYSTEM APPROACH

*“Adopting a Safe System starts with accepting the validity of a simple ethical imperative: No human being should be killed or seriously injured as a result of a road crash...”*

*Four guiding principles are central to a Safe System: Firstly people make mistakes that can lead to road crashes. Second, the human body has a known, limited physical ability to tolerate crash forces before harm occurs. Third, while individuals have a responsibility to act with care and within traffic laws, a shared responsibility exists with those who design, build, manage and use roads and vehicles to prevent crashes resulting in serious injury or death and to provide post-crash care. Fourth all*

*parts of the system must be strengthened in combination to multiply their effects, and road users are still protected if one part fails.*

*...Ultimately the test of a Safe System is how well it works for its youngest, eldest and most vulnerable users. Streets safe for children are a priority, and often a starting point, for cities embarking on the journey to a safe system. Safe-routes-to-school programmes are localised micro-Safe Systems...”*

*ITF Zero Road Deaths and Serious Injuries Leading a Paradigm Shift to a Safe System.*

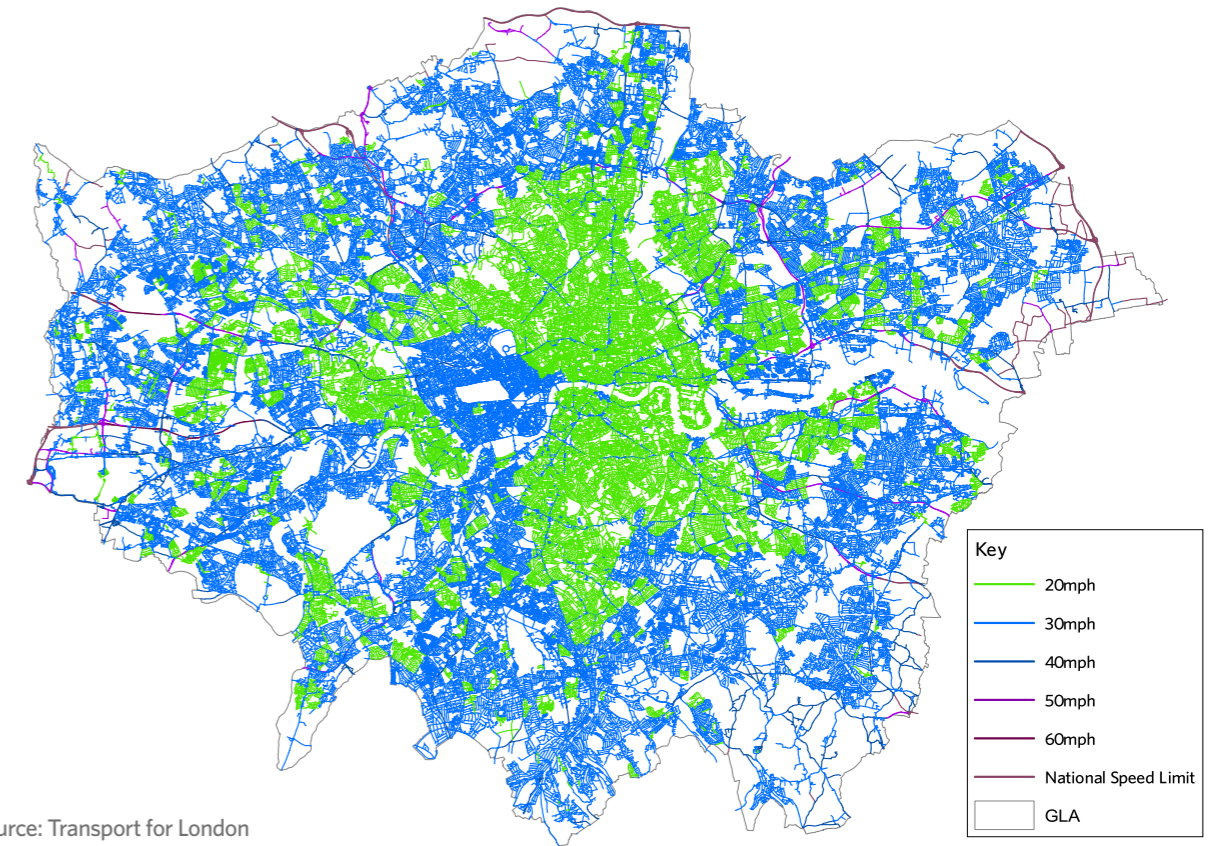


## REDUCING SPEED

Reducing vehicle speeds saves lives. Speed is the single most important factor in determining the outcome of a collision, and lower speeds also mean that there is more time to react to prevent a collision.<sup>136</sup> 20mph zones are therefore ideal for residential areas and around schools. Zones which include traffic calming measures such as speed humps, chicanes, or road narrowing are more effective than roads with just 20mph limits that lack such infrastructure.<sup>137</sup> Since accelerating and decelerating can cause additional emissions, guidance suggests designing zones to promote a smooth driving style, and which encourage drivers to maintain a reduced, steady pace along the whole stretch of road.<sup>138</sup>

Almost 25% of London's roads now have 20mph speed limits, including many areas around schools. Transport for London has developed a digital speed limit map (see Figure 9 opposite)<sup>139</sup> which allows buses and other operators to use Intelligent Speed Assistance (ISA) technology to ensure that vehicles comply with these speed limits. Trials showed that buses fitted with ISA technology remained within the speed limit 97-99% of the time, with limited excess speeds only found on downhill sections of road. TfL intends to require all new buses from 2017 to have this technology fitted.<sup>140</sup> An increasing number of UK vehicles now are fitted with 'Autonomous Emergency Braking' which can detect possible collisions and automatically apply brakes to rapidly reduce speed.<sup>140a</sup>

FIGURE 9: DIGITAL SPEED MAP OF LONDON



Source: Transport for London

## SCHOOL CROSSING PATROLS

School crossing patrols can help to ensure that children are able to cross the road safely outside schools. Patrols wear an official uniform and display a 'stop' sign. It is against the law for a driver to fail to stop for the patrol.<sup>141</sup> Crossing patrols are funded

by local councils. However, as they are not a legal requirement, many London boroughs have reduced their crossing patrol service as part of efforts to make financial saving in light of lower funding from central government. Over 1,000 crossing patrols have been removed across the UK since 2010.<sup>142</sup>



## 4 PROMOTING SUSTAINABLE AND ACTIVE SCHOOL TRAVEL

Many of the greatest public health benefits relating to journeys to school come from regular exercise. 'Modal shift' from vehicles to active travel yields triple benefits – from lowering emissions, increased exercise and improving physical and mental wellbeing.

### ACCREDITATION SCHEMES: STARS AND HEALTHY SCHOOLS

The Mayor of London has set targets for increasing the proportion of children walking and cycling to school. As well as cycle training at school, there are a number of schemes that seek to promote active travel to school. This includes the STARS (Sustainable Travel: Active Responsible Safe) accreditation scheme, run by Transport for London (TfL).<sup>143</sup> This is an awards scheme that provides resources to schools to encourage active travel, including over 115 activities such as:

- Car-free days
- Park and stride
- Car-free zone
- Walking buses

Each activity listed on the website provides a short description, an explanation of who it is suitable for (which age groups, and parents/carers), and sets out guidance on how to achieve this. It includes initiatives led by other organisations, such as Living Streets' WoW initiative which incentivises walking or cycling to school through a series of rewards badges each month for children who walk at least

once a week. TfL also promotes Youth Travel Ambassadors, who promote peer-to-peer education and encourage active travel. In 2017, TfL updated the list of activities to include activities that focus on air quality around schools.

Currently about half of London schools participate in STARS. Depending on the number and type of activities that schools undertake, they can earn a Bronze, Silver or Gold award. To incentivise participation, schools must be signed up for the STARS scheme to be eligible for school travel funding from TfL, for example for new bike shelters. Since the accreditation scheme started in 2007, TfL estimates that over 13 million miles of car journeys have been replaced by active travel (see Figure 10 below).<sup>144</sup>

In addition to STARS, the Greater London Authority also promotes a Healthy Schools accreditation programme, in which sustainable travel is one component alongside healthy food and physical activity within school.<sup>145</sup>



## 5 LOCAL VEHICLE RESTRICTIONS AROUND SCHOOLS

Most schools in the UK already have yellow 'zig zag' lines outside them, which restricts parking and stopping immediately around the school gate. However, new approaches go further. Inspired in part by a pilot scheme in Edinburgh, a number of London

councils are running trials schemes to restrict vehicles around schools. These approaches have the multiple benefits of reducing emissions around schools, encouraging walking and keeping the areas outside of schools clear of parked vehicles.

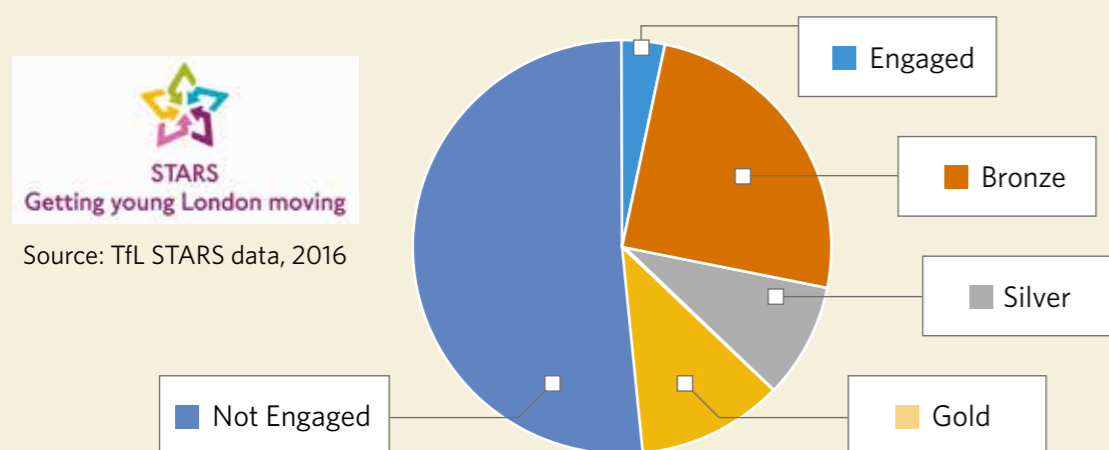


“ Why can't we work with schools and councils to have some roads outside schools where cars aren't allowed to go? Really encourage mums, dads, carers and children to walk to school. It will be safer and you are not breathing in toxic air when playing in the playground.”

**Sadiq Khan**  
Mayor of London



FIGURE 10: SCHOOLS IN LONDON



Source: TfL STARS data, 2016



## LESSONS FROM EDINBURGH

In 2015, Edinburgh, the council introduced a pilot scheme to limit traffic in the streets directly outside nine schools at key times.<sup>147</sup> The project used an 'Experimental Traffic Regulation Order' (ETRO) to legally restrict vehicles. Drivers were made aware of the restrictions at each location through large signs at all entry points that flash during school-specific operating periods. As part of the Order, exemptions for specific vehicle types were included, for example, doctors and utility companies. An evaluation of the scheme found that average

speeds around the schools fell by 1.2mph, with fewer vehicles using the roads. In addition more children walked to school, and the proportion of children travelling to school by car fell by 6%. The evaluation concluded that vehicle restrictions were more effective in locations with little or no through access, and those that had few large developments which might require exemptions. It emphasised the need for peripheral streets to be able to accommodate displaced traffic movements, and contain appropriate parking capacity or be near suitable 'Park and Stride' locations.<sup>148</sup>

## CAMDEN: HEALTHY SCHOOL STREETS

In London, the first temporary road closure outside a school was in the borough of Camden. This scheme, funded by TfL's 'Future Streets Incubator Fund' is a temporary closure of the road, indicated by signs and enforced by temporary (folding) bollards that are raised and lowered by school staff. The road is closed between 8.30am to 9.15am and 3.15pm to 4pm. Camden had initially hoped to trial the scheme in three schools, but ultimately only went ahead with one school for the trial, in part due to concerns about opposition from local residents.<sup>149</sup>

Like Edinburgh, the scheme was introduced using an Experimental Traffic Regulation Order. This only requires statutory consultation, with full consultation starting as part of the trial once it is in place, allowing people to experience the changes before responding. However, in any case, a broader consultation was carried out with

local people ahead of the pilot, with 80% of residents responding positively.

The school in the pilot is on a narrow one-way street in Central London in an area where high numbers of pupils walk to school. Where streets were not already one-way, Camden intended to make them act as one-ways with one entrance and one exit. This meant that residents could exit the area at all times by motor vehicle and school staff were not faced with having to raise two sets of bollards with the potential for drivers to get stuck in the middle. Air quality data collected on the street outside the school indicates that air quality has improved, with a 3.8% reduction in NO<sub>2</sub> levels overall on school days. Driven trips to school fell by 43% as a result of the closure. This may be because the benefits of driving were marginal, and the improvement in the street environment outside the school was enough to nudge parents into walking instead.

## HACKNEY: SCHOOL STREETS

Hackney in east London has announced plans to pilot restrict access to the road outside schools at school opening and closing times in two schools. This scheme will use signs to inform drivers of the restrictions before entering the closed road, and vehicles will not

be able to drive in, out or through the street between these times unless they have been given an exemption. Non-registered vehicles entering or exiting the street during the times of operation will be identified by camera and issued a fixed penalty notice.<sup>150</sup>



## HAVERING: PUBLIC SPACE PROTECTION ORDERS

Havering, an outer London borough, has introduced a different approach to restricting vehicles around schools. This uses 'Public Space Protection Orders' (PSPO) around several schools, which are designed to tackle antisocial behaviour that has a detrimental effect on the local community. The restriction states that the stopping and dropping off or picking up of school children between 8am and 9.30am and between 2.30pm to 4pm will be prohibited.

The area is monitored by cameras and any vehicle seen stopping to drop off or pick up pupils during these periods

within the designated zone will be issued a Fixed Penalty Notices (FPNs).

In comparison to other London schemes, the Havering restrictions target a wider area, with more roads around the schools included in the zones. The pilot scheme has resulted in a 90% reduction in traffic in around schools during drop off and pick up times. However, although there has been a reduction in the number of vehicles around schools, there are also reports that it has led to shifting many of the safety issues relating to parking to other roads further from the school.<sup>151</sup>

## 6 GREEN WALLS TO BLOCK AND ABSORB POLLUTION

Green walls or green screens are physical barriers covered with plants intended to block air pollution and absorb pollutants. Green screens have multiple benefits, as they can enhance the look of the local environment, as well as being a physical barrier that raises awareness of invisible air pollution, supporting other actions to reduce exposure.<sup>152</sup>

Green screens are still relatively new and experimental. Evidence suggests that the plants in these barriers absorb NOx and trap fine particles. There have been some studies that attempt to look at which plants are best to use. They also explore how the characteristics of the local area can affect air flow and

the effectiveness of screens as barriers to reduce air pollution within the school grounds. However, this is an area where more research is needed.<sup>153</sup>

The Mayor's Air Quality Fund has supported the installation of 'green walls' at schools adjacent to main roads to reduce exposure of young children to polluted air. In the borough of Haringey, three screens have been introduced. One study in a school in the Borough of Kensington and Chelsea found that there was a decrease of over one-third in the concentration of pollutants on the playground side of a new ivy screen.<sup>154</sup> Other green screens have been introduced at schools in Redbridge, Barnet, and Barking and Dagenham.<sup>155</sup>

### KEY FACTS: ACTION FOR CLEAN AIR AND HEALTHY ROUTES TO SCHOOL IN LONDON

- London has a range of initiatives to reduce emissions from vehicles, including the Congestion Charge, Low Emissions Zone, a proposed T-Charge and Ultra Low Emissions Zone (ULEZ). As well as support for ultra-low emission vehicles.
- London has one of the most developed air quality monitoring networks anywhere in the world. It uses information on air pollution levels to provide advice and alerts.
- London is also supporting work to better understand the real-world emissions from vehicles (TRUE), in order to provide information to consumers.
- London is working with schools to undertake air quality audits and work with local boroughs to implement the recommendations to make long-lasting improvements. Schools can also help pupils better understand air quality and map low pollution routes to school by using resources such as the LSx CleanerAir4Schools toolkit.
- The Healthy Streets approach is based on 10 evidence-based characteristics of streets that encourage active travel and promote wellbeing.
- London has committed to 'Vision Zero', which emphasises the role that road design can play in minimising the risk of injury, as part of creating a 'safe system'
- TfL's STARS (Sustainable Travel: Active Responsible Safe) accreditation scheme provides resources to schools to encourage active travel, including over 115 activities.
- A number of London councils are trialling schemes to restrict vehicles around schools in order to improve road safety and reduce pollution.



# KEY LESSONS LEARNED FROM LONDON

The impact that roads and vehicles are having on children is heart-breaking. Whilst urban living can offer huge benefits in terms of culture, employment and education, children are being unnecessarily exposed to harmful vehicle emissions and road safety risks as they access it. The journey to and from school, and the experiences that children have during that journey can have long term effects on their health, well-being, and future travel decisions. London is grappling with these challenges. Around the world, the same goal of developing a liveable city with safe and healthy routes to school is faced by every authority.

London is a global city, part of the C40 network, and is exchanging learning and experiences with other cities around the world. Tackling air pollution requires a focus

on long-term sustainability that also tackles carbon emissions and climate change.

Children growing up in any city should be able to look forward to a lifetime of opportunities. It is vital that what education offers, the roads should not take away – safe roads, clean air, and low-carbon mobility are vital priorities. These are the mission of the FIA Foundation and the driving focus of the Child Health and Mobility Initiative.

There are many ways in which London is seeking to address the pressing issue of poor air quality, and the role which transport plays in that issue. This report has outlined those attempts. The lessons to be learned by other cities are numerous. Here we outline the key ones.

## ■ LEADERSHIP IS VITAL

The Mayor of London Sadiq Khan has made tackling air pollution a key political priority, which is crucial to leading change. Previous Mayors have also taken bold steps by introducing a congestion charge, and improving segregated cycling facilities and quiet routes. The role and powers of the Mayor, including setting the GLA's budget, gives them the ability to set policies to enable significant and ambitious change. For example Sadiq Khan has also embraced the idea of Healthy Streets as a framework for urban transformation. Leadership by schools and other community stakeholders around sustainable travel can also create a culture that promotes active travel and leads to improvements outside the school gate.

## ■ ENGAGE, & WORK TOGETHER WITH, A RANGE OF DIFFERENT GROUPS

Safe and healthy routes to school require change across a whole range of issues such as poor air quality, road safety, active travel, urban design and planning. It is important to draw different coalitions and constituencies of interest together to address them. Unified voices calling for action can help build the case for change and justify action.

## ■ REAL CHANGE REQUIRES ACTION AT MORE THAN ONE POLITICAL LEVEL

Action to clean up vehicles will only be effective if it is part of a wider strategy on vehicles, fuels, infrastructure and improved public transport. Action is needed at all levels, from the international to local. In London, the Mayor of London has used powers to influence vehicle emissions through the introduction of congestion charging and (ultra) low emission zones. He has also been calling for a national diesel scrappage fund and for reform of tax incentives for diesel vehicles.

## ■ ACCURATE INFORMATION IS VITAL FOR EVIDENCE-BASED POLICY & CONSUMER CHOICE

Effective policy change depends on having a good understanding of what is happening in the real world. London's network of air quality monitoring stations and modelling by King's College London provides an invaluable resource to understand air quality levels in the city. TfL has also undertaken in-depth reports to understand behaviours, including factors influencing active travel on journeys to schools. Understanding real-world emissions of vehicles in urban environments is also vital to shape vehicle policy, and London's engagement with the The Real Urban Emissions Initiative (TRUE) [www.trueinitiative.org](http://www.trueinitiative.org) to provide accurate consumer information is a strong example that should be followed by other cities.

## ■ INVOLVE CHILDREN & DESIGN STREETS WITH THEM IN MIND

Using citizen-science to enable children to understand the issues of air pollution, such as the LSx CleanerAir4Schools toolkit, also empowers them to influence their own travel choices. Providing training and support for schools to promote sustainable and active travel as London does through the STARS programme also does this, including helping children identify safe and healthy routes for themselves.

It is also important that the perspective of children is included when decisions about street design are made, and consideration is given to ensuring that children have a choice of low-pollution routes to school that are safe, attractive and interesting to walk or cycle. This can involve reducing speeds, ensuring safe crossings that they are free of litter and graffiti, as well as linking with parks and other green spaces. Initiatives such as London's 'community street design' are examples of this.

## ■ PUT HEALTHY ROUTES AT THE HEART OF PLANS, FUNDING & APPRAISAL

London has identified walking and cycling as a priority, and this is reflected in London's overarching business plan as well as the Mayor's draft transport and environment strategies. The business plan identifies dedicated funding for these areas – £2.1bn for creating Healthy Streets by 2021/22, including £154 million a year for cycling, and £875m to improve the quality of the capital's air.

One of the most radical things about London's commitment to a 'Healthy Streets' approach is its ambition to change 'business as normal' in project design and approval. To ensure that roads are designed with people, not just vehicles in mind, Healthy Streets indicators are used to assess proposals, and such an approach is important to ensure strategy is translated into real improvements.

## ■ REGULATE TO LIMIT VEHICLES & REDUCE EMISSIONS

Ultimately, in order to reduce air pollution, it is necessary to reduce the sources of pollution. In London, this means reducing pollution from vehicles through restricting the most polluting vehicles and promoting low emission vehicles through road charges and (ultra) low emissions zones across polluted areas. It is also possible to close roads or restrict parking around schools. In London many boroughs have also managed to change driver behaviour through anti-idling campaigns and enforcement of engine idling laws.

## ■ EMBRACE TECHNOLOGY

New technology offers the potential to provide tailored real-time information in order to inform decisions and enforce policies. Examples in London include new technology to test real-world emissions from vehicles at the roadside, apps to help people identify low pollution routes, automatic text message alerts about air pollution, and automated bus stop messages warning of high pollution episodes.



# COALITION FOR CHANGE

The FIA Foundation and its partners in the Child Health Initiative (CHI) are leading work to promote safe and healthy journeys to and from school around the world.

The mission is to build a coalition of country and donor support for the objective of a safe and healthy journey to school for all children by 2030 through promotion of 'safe system' transportation design and urban planning; promoting safe footpaths, cycle lanes and lower vehicle speed limits; legislation and interventions for motorcycle helmet and seat belt use and safe & affordable public transport; and supporting policy and technical interventions to bring air quality levels within World Health Organization guidelines.

CHI focuses on three key rights of the child:

- Safe, accessible, low-carbon mobility to promote equity and combat poverty;
- Clean air and a healthy environment;
- The role of safe and healthy mobility in enabling the right to an education.<sup>158</sup>

From UN Environment's work to promote walking and cycling, to Amend's work to make school streets safer, the Child Health Initiative (CHI) is working to reduce air pollution, save kids' lives and foster road networks that create liveable, healthy cities.



# ANNEX 1: RELEVANT PUBLICATIONS

## Key London publications:

- Mayor of London (2016) 'A City for all Londoners' Greater London Authority  
[www.london.gov.uk/sites/default/files/city\\_for\\_all\\_londoners\\_nov\\_2016.pdf](http://www.london.gov.uk/sites/default/files/city_for_all_londoners_nov_2016.pdf)
- Mayor of London / TfL (2017) 'Healthy Streets for London' Transport for London  
[content.tfl.gov.uk/healthy-streets-for-london.pdf](http://content.tfl.gov.uk/healthy-streets-for-london.pdf)
- Mayor of London (2017) 'Mayor's Transport Strategy (draft)' Greater London Authority  
[consultations.tfl.gov.uk/policy/mayors-transport-strategy/user\\_uploads/pub16\\_001\\_mts\\_online-2.pdf](http://consultations.tfl.gov.uk/policy/mayors-transport-strategy/user_uploads/pub16_001_mts_online-2.pdf)
- Mayor of London (2017) 'London Environment Strategy (draft)' Greater London Authority  
[www.london.gov.uk/sites/default/files/8314\\_gla\\_les\\_online\\_single\\_page.pdf](http://www.london.gov.uk/sites/default/files/8314_gla_les_online_single_page.pdf)
- Mayor of London (2016) 'Mayor's Air Quality Fund: Supporting local actions on air quality'  
[www.london.gov.uk/sites/default/files/mayors\\_air\\_quality\\_fund\\_report\\_2016.pdf](http://www.london.gov.uk/sites/default/files/mayors_air_quality_fund_report_2016.pdf)

## Relevant health guidance from Public Health England

- Public Health England (2014) 'Everybody active, every day'  
[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/374914/Framework\\_13.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374914/Framework_13.pdf)
- Public Health England (2017) 'Everybody active, every day: 2 years on'  
[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/601298/Everybody\\_active\\_every\\_day\\_2\\_years\\_on.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/601298/Everybody_active_every_day_2_years_on.pdf)
- Public Health England (2016) Road injury prevention: Resources to support schools to promote active travel  
[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/505277/25\\_Feb16FINAL\\_DOCUMENT.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/505277/25_Feb16FINAL_DOCUMENT.pdf)
- NICE (2017) 'Air pollution: outdoor air quality and health'  
National Institute for Health and Care Excellence and Public Health England  
[www.nice.org.uk/guidance/ng70](http://www.nice.org.uk/guidance/ng70)

## FIA Foundation and Child Health Initiative publications

- FIA Foundation and UNICEF (2015) 'Safe to Learn: Safe journeys to school are a child's right'  
[www.fiafoundation.org/media/45780/safe-to-learn-report.pdf](http://www.fiafoundation.org/media/45780/safe-to-learn-report.pdf)
- FIA Foundation and UNICEF (2016) 'Rights of way: Child poverty and road traffic in the SDGs'  
[www.fiafoundation.org/media/391038/rights-of-way-spreads.pdf](http://www.fiafoundation.org/media/391038/rights-of-way-spreads.pdf)
- FIA Foundation and Amend (2016) 'Step Change: An action agenda on safe walking for Africa's children'  
[www.fiafoundation.org/media/402415/step-change-pages.pdf](http://www.fiafoundation.org/media/402415/step-change-pages.pdf)

# ANNEX 2: LIST OF ORGANISATIONS MET AS PART OF RESEARCH

During the scoping phase of this research, meetings were held with representatives from the following organisations to inform the case study:

- King's College London  
[www.kcl.ac.uk](http://www.kcl.ac.uk)
- Transport for London  
[www.tfl.gov.uk](http://www.tfl.gov.uk)
- Greater London Authority  
[www.london.gov.uk](http://www.london.gov.uk)
- London Councils  
[www.londoncouncils.gov.uk](http://www.londoncouncils.gov.uk)
- Client Earth  
[www.clientearth.org](http://www.clientearth.org)
- Aether  
[www.aether-uk.com](http://www.aether-uk.com)
- London Sustainability Exchange  
[www.lsx.org.uk](http://www.lsx.org.uk)
- British Lung Foundation  
[www.blf.org.uk](http://www.blf.org.uk)
- Arup  
[www.arup.com](http://www.arup.com)
- Camden Council  
[www.camden.gov.uk](http://www.camden.gov.uk)
- Sustrans  
[www.sustrans.org.uk](http://www.sustrans.org.uk)
- Living Streets  
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