GREATER**LONDON**AUTHORITY

REQUEST FOR MAYORAL DECISION – MD2352

Title: C40 air quality hyper-local sensor programme – partnership with King's College London

Executive Summary:

The Mayor has identified improving air quality as one of his key priorities. Critical to this is a comprehensive understanding of air quality in London and enhancing our monitoring and modelling capabilities. The GLA will work with C40, the Environmental Defense Fund and King's College London to deliver an air quality hyper-local sensor network. The value of this programme is £900,000 (funded via philanthropy) with the GLA contributing up to £150,000 to King's College London to deliver a 'wearable' air quality monitoring component targeted at school children. This will, for the first time, characterise real-world exposure of London's school children to air pollution.

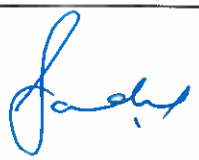
Decision:

That the Mayor approves grant funding of up to £150,000 to King's College London to fund the wearables component of its air quality hyper-local sensor network.

Mayor of London

I confirm that I do not have any disclosable pecuniary interests in the proposed decision and take the decision in compliance with the Code of Conduct for elected Members of the Authority.

The above request has my approval.

Signature: 

Date: 6/9/18

PART I - NON-CONFIDENTIAL FACTS AND ADVICE TO THE MAYOR

Decision required – supporting report

1. Introduction and background

1.1 Improving air quality is a public health priority. Air pollution is estimated to be contributing to over 9,000 premature deaths a year caused by long-term exposure. There is also strong scientific evidence of the acute health effects of short-term exposure to very high levels of pollution, like those experienced during an air pollution episode. It is essential that coordinated action is taken to reduce exposure, especially amongst those most at risk such as school children (and the elderly).

1.2 Critical to doing this is having a comprehensive understanding of air quality in the city and enhancing our current monitoring and modelling capabilities. To do this the GLA will work with C40, the Environmental Defense Fund (EDF), Google, AirMonitors, Cambridge University and King's College London to deliver an air quality hyper-local sensor network.

1.3 The Mayor announced the GLA's participation in a joint programme with C40 in December 2017 during his official visit to India and Pakistan. The total value of this programme is £900,000 with £750,000 in funding for this having been provided by the Children's Investment Fund Foundation, a philanthropic foundation.

1.4 A competitive process was undertaken by C40 to recruit the delivery partners, the winners were a consortium led by EDF. King's College London participated in this process coming second. However, their bid included a particularly innovative and valuable 'wearable' air quality monitoring component targeted at school children. As a result, it was agreed that the GLA would contribute up to £150,000 to help fund this component (making King's part of the consortium), as well as to more generally support the delivery of the hyper-local sensor programme.

1.5 The EDF Consortium have 100 fixed air quality sensors (AQMesh pods) to be deployed in (i) pollution hotspots, (ii) areas close to highly sensitive receptors and (iii) areas identified as experiencing an air quality management intervention during the project. King's will deploy wearable sensors alongside this fixed sensor network by engaging schools and citizens living and working in the identified neighbourhoods. The communities themselves will carry the sensors as they go about their daily lives, travelling to and from school, work and home. This will raise the profile of the project, give communities a greater sense of involvement and empowerment and aid the dissemination of project outcomes.

1.6 The value of the decision falls within the upper limit of a Director Decision. However, approval is being sought via a Mayoral Decision. This is because this project forms a small part of a much larger programme which means it is, in part, exposed to the risks associated with the programme as a whole. In practice this means the success of the wearables project is linked closely to the success of the other components and ability of the delivery partners to disseminate the findings in a cohesive way. In addition, it is not clear what the findings of this project will be. Given that it will examine the exact exposure of young children in London to pollutants on a scale that hasn't been attempted before, the data collected may prove contentious.

2. Objectives and expected outcomes

2.1 This work programme will contribute to the London Environment Strategy objectives:

- Objective 4.1 – Support and empower London and its communities, particularly the most disadvantaged and those in priority locations, to reduce their exposure to poor air quality.

- Objective 4.2 – Achieve legal compliance with UK and EU limits as soon as possible, including by mobilising action from London boroughs, Government and other partners.

- Objective 4.3 – Establish and achieve new, tighter air quality targets for a cleaner London by transitioning to a zero emission London by 2050, meeting World Health Organization health-cased guidelines for air quality.

2.2 The main elements of the work programme, its objectives and expected outcomes are set out below.

(For C40 air quality sensor programme objectives and outcomes see Appendix)

King's College London 'wearables' component:

Objectives

- The data collected in this project will, for the first time, allow accurate characterisation of the real-world exposure of London's school children to air pollution on a large scale;
- Evaluate the reliability and quality of wearable sensors;
- Facilitate engagement and educational activities, including teaching, assemblies and experiments, delivered to 'hotspot' schools;
- Produce and collate content for wider dissemination within the C40 project via websites and social media, to include a guide to the use of wearable sensors for education and engagement;
- Collect anonymised activity tagged personal exposure measurements of all children and teachers taking part in the intensive campaigns (subject to ethical and GDPR approval);
- Develop understanding of the exposure of children to air pollutants throughout the school day.

Expected outcomes

- Increased citizen engagement in the air quality sensor programme;
- London's monitoring network extended at a hyper-local, personal level;
- A publicly accessible sensor test report detailing the performance of all tested wearable sensors against the predefined testing protocol, with recommendations for future use;
- A series of public-facing reports describing child exposure to air pollution within and around each school, home and travel route, with emphasis on modes of transport and active transport routes. Outcomes will be linked to GLA 'school air quality' audit recommendations;
- Technical report detailing the impact of engagement activities on pupil, teacher and parent attitudes towards air quality, its health risks and acceptance of actions to reduce emissions and exposure.

3. Equality comments

3.1 Children from a variety of backgrounds will be recruited for this research, with consideration of the Public Sector Equality Duty (PSED).

3.2 The GLA has published an analysis on exposure to air pollution undertaken by Aether which shows that not only are there huge health impacts of pollution but the way these fall on the most vulnerable means that improving air quality is fundamentally about tackling social injustice and health inequalities.

3.3 The updated report considers pollution exposure in London in 2013 and considers how exposure varies by age, indicators of relative deprivation and ethnic groups in London. It also looks at total exposure (broken down by borough) and exposure at schools. Through the research described in this report, City Hall is seeking to understand inequalities in access to clean air in London and to consider how this will be improved by planned air pollution controls.

3.4 The research shows on average that the most deprived 10th of the population are exposed to concentrations of NO_2 which are 25 per cent higher than the least deprived 10th of the population. It is important to note that hidden within this you also have pockets of extreme wealth with very high levels of exposure, e.g. those living in Westminster or in the Royal Borough of Kensington and Chelsea. Of the 360 primary schools located in areas of high pollution it is estimated about four-fifths are classified as 'deprived' with more than 40 per cent of the school children at a given school being eligible for free school meals.

3.5 In terms of ethnicity, whereas there is a normal distribution of exposure for white people, the pattern shows increasing exposure in areas that have higher percentage of non-white ethnic groups, with a particularly skewed distribution for the Black/African/Caribbean/Black British population. A greater proportion of mixed, black and other ethnic groups are exposed to levels of pollution that exceed the NO_2 limit value than their proportion of the total population.

3.6 The design of the policies set out in this MD will benefit all Londoners, but due to the unequal impacts of pollution on the most vulnerable Londoners there is likely to be a positive effect in tackling social and health inequality of this programme of activity. Having a better understanding of air pollution, particularly at schools will also create new opportunities to take targeted and effective action in accordance with the GLA's obligations in equalities legislation including the public sector equality duty.

4. Other considerations

	Risk description (cause, risk, event, potential impacts)	**Probability (1-5)**	**Impact (1-5)**	**RAG**	**Mitigation/risk response (state if the response is done or pending)**	**GLA Owner**
1	It may be difficult engaging citizens and primary schools to take part in the wearables campaign	2	3	G	Work with Kings' College and EDF to identify potential locations. Priority will be given to schools included in the Mayor of London's 'air quality	Rosalind O'Driscoll

					audit' programme and those participating in the NIHR-funded Childhood Health in Luton and London (CHILL) study, which is assessing the impact of the ULEZ on children's respiratory health.	
2	King's may not receive the ethical and GDPR approval.	2	3	G	King's has extensive experience of school engagement in London through large cohort studies and the BreatheLondon project. If approval is not forthcoming the GLA can work with our Education and Data teams to revise proposal to ensure ethics and GDPR standards are met. There will also be a Project Advisory Committee (PAC) including but not limited to input from health groups and a citizen representative. The GLA will not handle any personal data.	Rosalind O'Driscoll
3	Key deliverables, such as the data platform, may not be delivered on time.	3	1	G	Work closely with delivery partner (EDF) to ensure workload is completed as planned. Weekly catch-ups timetabled to assess if elements of the project are slipping and discuss how workload could be restructured to ensure there is no major slippage in key deliverables.	Rosalind O'Driscoll
4	The wearables component is not integrated effectively with the other components of project.	2	4	A	King's will be key attendees of the weekly catch-ups, ensuring all components of the project move forward together. Schools selected for the wearables study will host one of the fixed air quality sensor units for the duration of the campaign, providing a longer term more reliable assessment of air quality in the school grounds (and improved data quality of the wearable sensors). Google cars will pass by the school during the campaign, providing an exciting new component to outreach and engagement activities, in addition to	Rosalind O'Driscoll

					enhanced air quality mapping around the school.	

Impact assessment

4.1 A comprehensive Integrated Impact Assessment was undertaken to support the London Environment Strategy (LES) which covered air quality, including proposed action at schools and nurseries. The Integrated Impact Assessment (IIA) found that the GLA had considered aspects for improving London's air quality based on four policy options. This was recognised in the LES IIA as the most effective approach for addressing human health impacts. The LES includes targets for some of the pollutants identified in the IIA recommendations. The GLA agreed that it would look to include specific interventions to improve air quality around schools, hospitals and care homes.

Links to Mayoral Strategies

4.2 Policy 4.1.2 of the London Environment Strategy (Improve the understanding of air quality health impacts to better target policies and action) includes the proposal:

"Proposal 4.1.2.b: The Mayor will work with boroughs to safeguard the existing air quality monitoring network, and enhance it by exploiting new technologies and approaches such as personal and localised monitoring"

4.3 The strategy explicitly recognises the importance of both the C40 sensor project and advancing understanding of how and when to use personal monitors:

"The Mayor will work with boroughs and other partners to encourage innovation in monitoring, starting with a new sensor monitoring trial in partnership with the C40 Cities Climate Leadership Group. This is a network of the world's megacities committed to addressing climate change and air pollution.

It is getting easier for people and groups to buy personal and relatively low cost monitoring systems. These can be valuable tools, but knowing how best to use and locate the monitors is vital if the results are to provide meaningful information. It is also important to understand the limitations of monitoring equipment, and how best to interpret and publish results. The Mayor will offer guidance and advice on how air quality is monitored in London, and help people understand what type of equipment is available."

4.4 This programme is in conformity and takes forward the commitment set down in the London Environment Strategy.

5. Financial comments

5.1 Mayoral approval is sought to grant King's College London up to £150,000 to fund the wearables component of its air quality hyper-local sensor network. The grant will be paid in stages during 2018-19 and is to be funded from Environment team's 2018-19 Air Quality budget.

6. Legal comments

6.1 The proposed grant funding is authorised by the Mayor's powers to do anything that furthers the social and environmental improvement of London under section 30 of the GLA Act 1999. For the reasons set out in Section 3 above the proposal is consistent with the Mayor's duty to consider equality of opportunity under section 33 of the Act. The grant of funding should be recorded in a suitably worded grant agreement.

7. Planned delivery approach and next steps

7.1. *Set out how the project will be delivered and complete the outline timetable*

Activity	**Timeline**
Procurement of contract [for externally delivered projects]	August 2018
Announcement [if applicable]	na
Delivery Start Date [for project proposals]	October 2018
Final evaluation start and finish (external) [delete as applicable]:	Start: July 2019 Finish: November 2019
Delivery End Date [for project proposals]	November 2019
Project Closure: [for project proposals]	December 2019

Activity and deliverable deadline	**2018**					**2019**								
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Wearable sensor quality assurance and control																		
Fieldwork																		
D1: Sensor test report				◊														
School deployments within pollution hotspots																		
Fieldwork																		
D2: Engagement activities delivered to each school												◊						
D3: Public-facing school exposure reports													◊					
D4: Production and collation of content within the C40 project												◊						
D5: Anonymised activity tagged personal exposure database													◊					
D6: Technical report detailing the impact of engagement activities																	◊	

Appendices and supporting papers:
Appendix 1

Public access to information

Information in this form (Part 1) is subject to the Freedom of Information Act 2000 (FoIA) and will be made available on the GLA website within one working day of approval.

If immediate publication risks compromising the implementation of the decision (for example, to complete a procurement process), it can be deferred until a specific date. Deferral periods should be kept to the shortest length strictly necessary. **Note**: This form (Part 1) will either be published within one working day after it has been approved or on the defer date.

Part 1 - Deferral

Is the publication of Part 1 of this approval to be deferred? NO

Part 2 – Sensitive information

Only the facts or advice that would be exempt from disclosure under FoIA should be included in the separate Part 2 form, together with the legal rationale for non-publication.

Is there a part 2 form – NO

ORIGINATING OFFICER DECLARATION:	Drafting officer to confirm the following (✓)
Drafting officer: Elliot Treharne has drafted this report in accordance with GLA procedures and confirms the following:	✓
Sponsoring Director: Juliemma McLoughlin in lieu Lucy Owen has reviewed the request and is satisfied it is correct and consistent with the Mayor's plans and priorities.	✓
Mayoral Adviser: Shirley Rodrigues has been consulted about the proposal and agrees the recommendations.	✓
Advice: The Finance and Legal teams have commented on this proposal.	✓
Corporate Investment Board This decision was agreed by the Corporate Investment Board on the (insert date)	

EXECUTIVE DIRECTOR, RESOURCES:

I confirm that financial and legal implications have been appropriately considered in the preparation of this report.

Signature M. D. Gallo **Date** 4.9.18

CHIEF OF STAFF:

I am satisfied that this is an appropriate request to be submitted to the Mayor

Signature D. Bellamy **Date** 5/9/2018