



Request for Expressions of Interest (EOI)
Collection, analysis and presentation of hyperlocal air quality data in London
Tuesday 5 December 2017

The C40 Cities Climate Leadership Group hereby solicits your expression of interest for the above service and is hereby announcing its intent to issue a Request for Proposals (RFP) to interested and qualified companies who, either solely or in partnership, can provide in London a system of air quality sensors, presentation of hyperlocal data derived from these sensors, and data analysis to support policy design and citizen engagement. The project will be carried out in partnership with the Greater London Authority. This expression of interest is not competitive or binding; it is an opportunity to show interest in submitting a formal proposal. An expression of interest need be no more than a short paragraph describing your company and your interest in submitting a formal proposal.

Date of this EOI: 5 December 2017

Closing Date for Receipt of EOI: 20 January 2018

Address EOI for the Attention to: Josh Alpert, Director of Special Projects, C40

E-Mail Address: jalpert@c40.org

Description of Requirements

The RFP will include a request to include the following deliverables, up to a cost of \$1, 000, 000 (750 000 GBP). The below requirements are general and more detailed specifications will be set out in the RFP.

Data collection

The deployment of enough sensors to get an accurate and meaningful hyper-local map of air quality across London, including at pollution hotspots identified by the Greater London Authority.

These sensors can be fixed, remote or mobile, wearable, or a combination thereof; but should have a focus on delivering high-quality, local data. We envisage that mobile data will be a necessary component to achieve this mapping, especially in pollution hotspot areas.

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Key particles to monitor will be NO₂ and PM_{2.5}, but also with an interest in PM₁₀, NO, BC, CO₂. A range of possible instruments for each pollutant at various price ranges that meet the following requirements should be provided:

- High accuracy of time-resolved data at concentrations typical of urban and on-road conditions (ideally within 10-20%);
- 1-10 second sampling frequency;
- Minimal bias and cross-sensitivity;
- General acceptance by the scientific community as a valid and robust measurement approach, as evidenced for example by prior peer-reviewed research results;
- Ensure instruments are configured to properly detect air pollutants.

Sensor operation, maintenance and repair:

- Maintain instruments by designing an appropriate calibration schedule and a regular data quality review protocol. Plans for data quality review should be incorporated into the RFP, and should address issues of instrument performance and response (e.g., bias, noise, cross-sensitivity, comparison with other well-characterized instruments/standards) and other data quality issues that might impact the ability to draw robust inferences related to highly spatially/temporally resolved air quality measurements (e.g., for mobile measurements at ~ 1-10s time resolution);
- Concerns arising from data quality review should be reported and resolved expediently with a goal of at least 70% uptime;
- Provide a data-handling system that brings data from the instruments to C40;
- Automate data cleaning by harmonizing lag times, timestamps and aligning the various data sets from the various instruments;

Data analysis

Data analysis requirements will include:

- Identification of pollutants
- Concentration levels
- timescale of pollution around each sensor on a day-by-day scale
- Source attribution (to the extent possible)
- Synthesis with other London air quality data made available to the tendered company(ies)
- Key conclusions to inform policy recommendations on reducing air pollution and climate-warming
- Key conclusions on how other cities without significant traditional monitoring systems could use hyperlocal data to design air pollution interventions, either solely or in combination with other readily available data sources.

Data presentation

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Data presentation requirements will include:

- All data will be open and made available in its raw form
- Data should be presented using visualisation tools that lend themselves to wider dissemination and public engagement, including by creating an online hyper-local map of London air quality.

Appendix 1: About C40 Cities Climate Leadership Group



The C40 Cities Climate Leadership Group connects more than 90 of the world's greatest cities, representing 650+ million people and one quarter of the global economy. Created and led by cities, C40 is focused on tackling climate change and driving urban action that reduces greenhouse gas emissions and climate risks, while increasing the health, wellbeing and economic opportunities of urban citizens.

The current chair of the C40 is Mayor of Paris Anne Hidalgo; three-term Mayor of New York City

Michael R. Bloomberg serves as President of the Board. C40 is governed by a Steering Committee made up of C40 member city mayors, elected by their peers to represent the geographic diversity of the network. Currently, the C40 Steering Committee includes the mayors of Amman, Boston, Copenhagen, Durban, Hong Kong, Jakarta, London, Milan, Los Angeles, Mexico City, Tokyo, Paris and Seoul.

C40's work is made possible by our three strategic funders: Bloomberg Philanthropies, Children's Investment Fund Foundation (CIFF), and Realdania.

C40 positions cities as a leading force for climate action around the world. We define and amplify their call to national governments for greater support and autonomy in creating a sustainable future. Working across multiple sectors and initiative areas, C40 convenes networks of cities providing a suite of services in support of their efforts, including: direct technical assistance; facilitating of peer-to-peer exchange; and research, knowledge management and communications.

As a climate organisation of the world's greatest cities, C40 supports its members to move on to a low carbon development pathway, adapt to climate change, curb GHG emissions, and engage

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in partnerships among themselves and with global organisations, national governments, the private sector and civil society.

C40 Cities Climate Leadership Group, Inc. is a U.S. not-for-profit 501(c)(3) registered organisation, working with the world's megacities to tackle climate change. With offices in London and New York, and people working across the globe, C40 has about 150 staff members. Around a half are UK based, around a quarter are US based, the remainder cover roughly another 15 countries. C40 is continuing to expand with plans to register entities in other countries this year. C40 Inc. in the U.S. would remain as the party entering into contracts and handling most financial transactions for all its global affiliates.

Appendix 2. Background to the Project

London has the largest network of high accuracy automatic air quality monitors of any city, and a larger network of lower-cost NO₂ diffusion tubes, in addition to providing world-class modelling through the London Atmospheric Emissions Inventory.

However, despite this large network a very small proportion of the city is covered by air quality monitoring, and particulates even less so. This limits the ability of London and other similar cities to fully understand how pollution varies over space and time in local pollution hotspots, to design, target and assess the impact of policies accordingly, and to engage their citizens with information about air quality that is relevant to their lives – as they live, work and travel.

With the recent advances of mobile, portable, remote and wearable sensing technology, it has become possible to generate and analysis new data to fill these gaps, providing the opportunity to revolutionise both policy making and the engagement of citizens. This project seeks to add hyperlocal data to the bigger network of data already collected by London to determine how a more complete set of data shapes new air quality policies.

C40 is currently accepting expressions of interest (EOIs) in advance of issuing an request for proposals (RFP) for hyperlocal data collection, mapping, and analysis in London with a view to supporting policy making and citizen engagement. London with its air quality expertise is ideally placed to conduct a pilot to establish how these new methods of data collection and assessment can benefit cities in tackling the air quality crisis. In addition, the proposals should have a view to replicability in other C40 cities, including those that have a less developed traditional air quality monitoring capabilities.

Air quality is an increasing concern of C40 cities, and increasingly linked to the climate agenda . It is clear that poor air quality impacts climate and climate can impact air quality. Short-lived

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climate pollutants like black carbon, methane and tropospheric ozone are all agents that have a warming influence on climate, and are major emitting particulates from combustion. By addressing these short-lived pollutants, (as opposed to carbon dioxide, which have a much longer lifespan) we can help our cities achieve very near-term reductions in temperature as they're working towards their longer-term Paris Agreement-compliant 1.5-degree strategies.

Further, as air quality issues continue to rise within C40 cities, they add to the list of barriers our mayors face in implementing other climate actions. Or, on the contrary, if framed effectively, rising concerns on air quality in large segments of the global urban population can be an effective entry point for people into climate change issues. At the same time, we must be aware that what may be good for air quality may not always be good for climate and vice versa- as an example, diesel, which is generally better for GHG reductions, but worse from an air quality perspective.

This request for proposals provides the opportunity for London to develop a baseline of data and analysis that can deliver communication tools and policy interventions to aid in their fulfilling their commitments to tackling air quality and climate change. It also seeks to provide an example system that could be replicated to cities that do not have the proper instrumentation in place, if any at all. Between high costs for traditional sensor monitoring and a lack of expertise to fully understand how to create and use the data from a sensor monitoring system, cities begin tackling air pollution at a disadvantage.

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