

Request for Proposals (RFP)

Air Quality Sensor Procurement to Strengthen Air Quality Monitoring in Global Cities

Issued by:

C40 Cities Climate Leadership Group, Inc.

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United States of America

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**C40
CITIES**

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1. C40 Cities Climate Leadership Group Inc. (“C40”)

C40 is a network of nearly 100 mayors of the world’s leading cities, who are working to deliver the urgent action needed right now to confront the climate crisis, and create a future where everyone, everywhere, can thrive. Mayors of C40 cities are committed to using a science-based and people-focused approach to help the world limit global heating to 1.5°C and build healthy, equitable, and resilient communities. Through a Global Green New Deal, mayors are working alongside a broad coalition of representatives from labour, business, the youth climate movement, and civil society to go further and faster than ever before.

The strategic direction of the organisation is determined by an elected Steering Committee of C40 mayors, which is co-chaired by Mayor Sadiq Khan of London, United Kingdom, and Mayor Yvonne Aki-Sawyer of Freetown, Sierra Leone. Three-term Mayor of New York City Michael R. Bloomberg serves as President of

the C40 Board of Directors, which is responsible for operational oversight. A nine-person management team, led by Executive Director Mark Watts, leads the day-to-day management of C40. C40's three core strategic funders are Bloomberg Philanthropies, the Children's Investment Fund Foundation (CIFF), and Realdania.

To learn more about the work of C40 and our cities, please visit our [Website](#), or follow us on [Twitter](#), [Instagram](#), [Facebook](#), and [LinkedIn](#).

2. Summary

C40 is currently accepting proposals to provide air quality monitoring solutions using sensors for 14 cities. We invite suppliers to propose their preferred strategic approach to achieve the most effective balance of spatial coverage and data reliability within the project's budget.

The deployment spans ten countries:

- **South America:** Argentina (Buenos Aires), Brazil (Maceió, Mogi das Cruzes, Salvador), Ecuador (Quito), Guatemala (Guatemala City), Mexico (Guadalajara).
- **Africa:** Cote d'Ivoire (Abidjan), South Africa (Durban, Cape Town, Buffalo City), Uganda (Jinja City), Zambia (Kitwe).
- **West Asia:** Jordan (Amman).

The focus of this request is the selection and delivery of sensor technology/hardware, data accessibility, and virtual support - including technical training, manuals, and help desk - to assist cities during the sensor installation process.

Proposals must follow these guidelines:

- **Comprehensive Scope:** Include all four work packages listed in Section 4 to ensure a complete end-to-end solution.
- **Submission Flexibility:** Submit a proposal outlining support for *all participating cities* or provide a proposal focused on *a specific region (supporting a subset of the cities listed above)*.
- **Budgetary Limits:** The total budget is capped at **\$150,000 USD**; regional proposals must reflect a proportional share of this total budget.

C40 will prioritize solutions that balance cost-efficiency with data integrity. While all proposals must adhere to the established budget, our evaluation will focus on the highest value-to-cost ratio. We recognize that sensor specifications and data quality may influence unit costs; therefore, the final evaluation will weigh technical performance against the total quantity of sensors provided.

The Bidder must provide transparent, competitive pricing for all components. In **Annex A**, Bidders can find the **Technical Compliance Spreadsheet, which is mandatory for submission**; **Annex B** describes the desired specifications upon which the spreadsheet is based.

Note: The Bidder is not responsible for the physical installation of the sensors, but is expected to provide virtual support and manuals.

3. Background & Context

The purpose of this project is to strategically deploy air quality sensors across global cities to enhance cities' air quality monitoring capacity. The selected sensors will help cities monitor important air pollutants and the data collected from the sensors will inform city decision-making, public awareness, and targeted air pollution control measures.

C40's Air Quality Programme works with cities to accelerate reductions in air pollutants and GHG through the implementation of robust air quality management efforts. The programme supports cities by facilitating peer-to-peer knowledge sharing, providing direct technical assistance, organising trainings, building city staff capacity, and conducting research and pilot studies in collaboration with city staff.

4. Project Scope

Work Package 1: Air Quality Sensor Specifications and Delivery

Activity 1.1: Air Quality Sensor Specifications

C40 Cities is seeking sensor manufactures/providers who can offer reliable hardware adapted to the diverse environmental and technical requirements of our participating cities. While **monitoring of PM2.5 is a mandatory requirement** for all proposed solutions, we encourage the inclusion of additional parameters (e.g., PM10, NO2, O3, CO) where possible.

Budget Optimization & Hardware Scenarios

To optimize the allocation of sensors, C40 Cities invites proponents to break down costs by considering different scenarios using diversified hardware configurations when available. Bidders should specify the portion of the total budget allocated for Work Package 1 and, within that amount, provide a detailed breakdown of costs per sensor model and the resulting number of units.

For proponents offering multiple hardware models, we are interested in exploring the various possibilities and trade-offs between different sensing technologies. The following three options are provided as a provisioning framework to guide your proposal and facilitate C40's strategic analysis. Bidders are not required to choose one specific option; rather, these frameworks serve as a guide for understanding the best format to present your hardware combinations and how they meet city needs:

- **Option 1: Basic Coverage (High Volume):** Focuses on maximizing the number of units using relatively simple hardware to map general PM2.5 trends and identify spatial hotspots.
- **Option 2: Advanced Performance (Lower Volume):** Focuses on a smaller number of units with more complex features, such as multi-gas monitoring, and enhanced hardware resilience (e.g., solar energy kits).
- **Option 3: Hybrid Network (Strategic Resource Allocation):** A strategic mix of hardware models, either as a local mix (multiple types per city) or a regional mix (varying by city/region based on infrastructure).

Financial Comparison of Scenarios

Bidders offering multiple hardware options should present their models in a structured format (as shown below). This allows C40 to evaluate the **comparative trade-offs** between sensor models, unit costs, and the resulting quantities feasible within the allocated budget:

Proposed Scenario	Sensor Model(s)	Unit Cost	Quantity per City (avg)	Total Units (across all cities)	Total Cost
Scenario A (e.g., Option 1)					
Scenario B (e.g., Option 2)					
Scenario C (e.g., Option 3)					

Submission Requirements

- **Hardware Specification:** The Bidder must provide detailed hardware specifications for each model, including estimated hardware lifespan and performance stability under diverse climatic conditions. Detailed information on field calibration, remote diagnostics, and sensor replacement cycles is highly encouraged.
- **Connectivity Requirements:** The Bidder must specify if the proposed hardware requires a SIM card and a dedicated data plan for operation.
- **Installation Hardware:** The Bidder must confirm if the proposal includes all necessary mounting accessories and cables required for full configuration and deployment.
- **Power Supply:** The Bidder must specify the power supply options for each hardware option. For solar-powered configurations, the battery capacity should be specified along with the hardware runtime capabilities.

In Annex A, Bidders can find the **Technical Compliance Spreadsheet (mandatory for submission)**, while Annex B describes the **desired specifications** upon which the spreadsheet is based.

Activity 1.2: Sensor Shipment, Customs, and Delivery

The Bidder is responsible for the end-to-end logistics of delivering the air quality sensors and all accessories to the designated physical address provided by each participating city.

- **Comprehensive Delivery:** The Bidder shall manage all stages of transport from the point of origin to the final delivery location in each city.
- **Cost and Clearance Responsibility:** The Bidder must handle all administrative requirements for import and is **responsible for the payment of all customs duties, taxes, and clearance fees**. The cities and C40 Cities will not be responsible for any additional costs or logistics related to the entry of equipment into the country.
- **Protection against Loss:** The Bidder must provide insurance for all items during transit. Any units

that arrive damaged or are lost during shipment must be replaced by the Bidder at no additional cost.

- **Tracking and Documentation:** The Bidder must provide tracking details for all shipments. Each delivery must include a detailed packing list and the corresponding hardware documentation such as the calibration certificates and user manuals for the sensors.

Work Package 2: Data Management

The Bidder shall provide a secure, web-based infrastructure to host, visualize, and manage the data collected by the sensors. It must be accessible to city officials and technical teams without the need for complex software management.

To ensure the cities can use the data for reporting and further research, users must be able to download raw and processed data in editable formats.

Here are the basic requirements:

- **Free Data Access:** Each participating city government must have full, unrestricted access to all raw and processed data at no additional cost. The Bidder is prohibited from charging "data retrieval fees" or "per-download."
- **Subscription-Free:** The online platform must not be based on a "subscription-only" or "per-user license" model that requires recurring payments. Access to a dashboard for the agreed-upon number of users must be included in the initial equipment or service proposal.
 - Software updates, maintenance, and technical support must be covered under the service agreement.
- **Data Ownership:** Explicitly state that all raw and processed data collected by the sensors is the sole property of the city, and the Bidder cannot use this data for commercial purposes without prior consent.
- **Exit Strategy Support:** In the event of contract termination or platform change, the city retains full ownership of all historical data, and the Bidder will facilitate a final bulk transfer of the entire database.

Please complete and submit the enclosed [IT Security Review Form](#). This documentation is essential for our technical team to validate the software's alignment with our internal security and compliance standards

Note: This Request for Proposal does not require developing personalized dashboards for all the cities; it only requires standard provider infrastructure to access data.

Work Package 3: Training and Capacity Building

The Bidder shall develop and deliver a virtual training program in English to enable city staff to independently deploy and manage the air quality monitoring network.

The program must include sessions focused on:

Sensor Installation and Network Management

- **Sensor Installation:** Step-by-step instructions for secure attachment to various urban structures (e.g., utility poles, walls) and the safe connection of plug-in or solar power components.

- **Connectivity Setup:** Detailed procedures for activating SIM cards, configuring Wi-Fi credentials, and verifying that the sensor is successfully "heartbeating" to the central server.
- **Field Testing and Calibration:** Methods for verifying that a sensor is functioning correctly immediately after installation before the technician leaves the site.
- **Network Maintenance:** Basic network management processes for the sensor network to ensure the city can maintain the network infrastructure.

Data Management

- **Interface Navigation:** Training on the user interface, including how to locate specific sensors, view real-time maps, and manage user permissions.
- **Reporting and Exports:** Training on generating customized reports and performing bulk data exports in various formats (CSV, Excel, PDF) for further analysis or public sharing.

Format and Materials: Proposals should specify the number of sessions and duration.

Operations Guide: The Bidder preferably shall provide an Operations Guide in digital format (PDF). This guide must be tailored to the specific sensor model provided and be available in English.

Work Package 4: Help Desk and Replacement

The Bidder is required to provide minimum technical support to city staff to facilitate proper installation and data consistency for the duration of the warranty period.

- **Deployment Assistance:** The Bidder should provide remote support during the initial installation phase to troubleshoot any immediate setup issues.
- **Technical Helpdesk:** The Supplier should establish a clear process for reporting technical failures. Responses to critical technical inquiries should be provided within a reasonable timeframe.
- **Hardware Replacement:** The Bidder should manage the replacement of any units that experience hardware failure within the warranty period, including the logistics of shipping replacement parts or new units to the cities.

5. Proposal Guidelines

This Request for Proposals represents the requirements for an open and competitive process. Proposals will be accepted until **18 June 2026 at 11h59 GMT**. Any proposals received after this date and time will not be accepted.

Proposals should be concise and no longer than 15 pages, not including a cover page/letter, the Technical Compliance Spreadsheet and other attachments. All applications must be submitted in both PDF and Microsoft Word/Excel formats with margins not less than one inch. Text type must be 11 point or larger.

Content must be organized according to the structure below. Technical compliance for all parameters must be confirmed via the **Technical Compliance Spreadsheet (Annex A)**, which is a mandatory attachment.

1. **Company Profile:** Evidence of experience with international logistics and managing multi-city deployments across diverse regions.
2. **Plan for Work Packages:** A clear description of deliverables and the implementation approach for the four Work Packages defined in the Scope.
3. **Hardware Scenarios & Technical Specs:** Detailed hardware and software specifications. This section must include the **Hardware Provisioning Scenarios** (if applicable) to illustrate the trade-offs between sensor quantity and technical features.
4. **Data Integrity:** The use of AI-supported tools must be clearly outlined and justified. An explanation of data correction algorithms if existing (e.g., humidity and temperature normalization) and the methodology for QA/QC flagging.
5. **Pricing & Financial Breakdown:** Itemized pricing in USD. This must include the **Financial Breakdown Table** showing unit costs and quantities per city. Proposals must explicitly confirm zero recurring subscription fees and include all-inclusive estimates for shipping, customs, and duties.
6. **Risk Management:** Mitigation strategies focused specifically on: Handling customs delays, transit damage, and loss-replacement logistics; ensuring platform uptime, server security, and preventing data gaps.
7. **References:** Three professional references from similar air quality monitoring projects.

Please complete and submit the enclosed [IT Security Review Form](#). This documentation is essential for our technical team to validate the software's alignment with our internal security and compliance standards

Any data C40 shares is strictly confidential and cannot be shared with any AI tools.

Supplier Diversity

C40 is committed to supplier diversity and inclusive procurement through promoting equity, diversity and inclusivity in our supplier base. We believe that by procuring a diverse range of suppliers, we get a wider range of experiences and thoughts from suppliers and thus are best able to deliver to the whole range of our diverse cities and the contexts that they operate within.

We strongly encourage suppliers (individuals and corporations) that are diverse in size, age, nationality, gender identity, sexual orientation, majority owned and controlled by a minority group, physical or mental ability, ethnicity and perspective to put forward a proposal to work with us.

Feel welcome to refer to [C40's Equity, Diversity and Inclusion Statement](#) as supplier diversity and inclusive procurement is one element of applying equity, diversity and inclusion to help the world limit global heating to 1.5°C and build healthy, equitable and resilient communities.

Contract

Please note this is a contract for professional services and not a grant opportunity. Organisations unable to accept contracts for professional services should not submit bids. The work will be completed on the [C40 Standard Service Provider Agreement](#). These terms and conditions are non-negotiable. Organisations unable to accept them as drafted should not submit bids in connection with this opportunity.

If C40 is unable to execute a contract with the winner of this competitive process, we reserve the right to award the contract to the second highest Potential Supplier.

Subcontracting

If the organisation submitting a proposal needs to subcontract any work to meet the requirements of the proposal, this must be clearly stated. All costs included in proposals must be all-inclusive of any outsourced or contracted work. Any proposals which call for outsourcing or contracting work must include a name and description of the organisations being contracted.

6. RfP & Project Timeline

All proposals are due no later than **18 June 2026 at 11h59 GMT**. Any proposals received after this date and time will not be considered.

RFP Timeline	Due Date
Request for Proposals sent out	May 18, 2026
Questions submitted to C40	June 5, 2026
C40 responds to questions submitted	June 9, 2026
Deadline for receiving Offers	June 18, 2026
Short-listed bid interviews	June 25, 2026
All Bidders notified of outcome	June 30, 2026

Please note that these dates are to be used as a guide and are subject to change.

Project timeline			
#	Deliverable / Activity	Description	Due Date
1	Kick-off Meeting	Initial project alignment, stakeholder introduction, and timeline confirmation.	Week 1
2	City Coordination & Shipping Alignment	Direct contact with city leads to verify delivery addresses, import requirements, and logistics.	Week 2
3	Provision of Sensor Technical Specifications Portfolio	Delivery of detailed technical data sheets for sensors and mounting accessories.	Week 3
4	Comprehensive Deployment Plan	Strategic logistical roadmap for multi-city delivery.	Week 4
5	Air Quality Sensor Operations Guide	Delivery of the digital (PDF) step-by-step manual for installation and maintenance.	Week 9
6	Shipment & Customs Clearance	Completion of end-to-end logistics, insurance, and delivery to participating cities.	Week 10
7	Virtual Capacity Building Training	Kick-off delivery of structured training program on deployment and data management.	Week 10
8	Sensor Installation & Activation	Kick-off of remote-supported for physical deployment.	Week 11

9	Help Desk & Support Activation	Kick-off of customer support to assist cities with hardware issues.	Week 11
10	Dashboard & Public Portal Launch	Activation of secure web-based platform and citizen-facing visualization tool.	Week 12
11	Training Outcomes & QA/QC Report	Assessment of staff training results and initial data quality validation.	Week 25
12	Final Project Implementation Report	Comprehensive close-out report including success assessment and recommendations.	Week 30

Please note that these dates are to be used as a guide and are subject to change.

7. Proposal Evaluation Criteria

The proposals will be evaluated against the criteria in the table below.

Criteria	Description	Weighting(%)
Technical Specifications & Resilience	Evaluation of sensor specifications, accuracy, capabilities, hardware durability and data management infrastructure; robustness of security controls (encryption/access management), secure hosting arrangements, and compliance with C40's IT/data security requirements.	30%
Value for Money & Budget Optimization	Analysis of the proposed Work Package 1 cost-effectiveness, including the total quantity of units provided per city and the strategic value of the hardware scenarios.	20%
Experience & Proven Track Record	Assessment of the Bidder's history in similar projects, including reliability of hardware and quality of references.	20%
Regional Presence & Ethical Alignment	Preference for organizations with a physical presence or significant project experience in Africa and/or Latin America , demonstrating local context and shared values.	15%
Training & Technical Support	Evaluation of the support package, including maintenance guidance, training materials, and help-desk availability.	15%

8. Project Budget

Total project costs (incl. VAT and other 'hidden' costs) should not exceed **150,000.00 US Dollars**.

All proposals must include proposed costs to complete the tasks described in the project scope, including all VAT and taxes. Costs should be stated as one-time or non-recurring costs or monthly recurring costs. The proposal must indicate a cost breakdown structure, outlining the costs for each component of the project (i.e. preliminary scoping, transport, scales, etc.). All costs incurred in connection with the submission of this RfP are non-refundable by C40. All budgets are to be prepared in US Dollars.

9. C40 Policies

C40 expects third parties to be able to abide by these C40 policies

- Non-Staff Code of Conduct Policy [here](#)
 - Equity, Diversity and Inclusion Policy [here](#)
 - [C40 Non-Staff Travel and Expenses Policy - [here](#)]
-

10. Submissions

Each bidder must submit 1 copy of their proposal **in English** to the following points of contact by **18 June 2026 at 11h59 GMT** with the subject **[RFP] Air Quality Sensor Procurement to Strengthen Air Quality Monitoring in Global Cities**.

- Air Quality Team
airquality@c40.org
- Camila Acosta Camargo
Senior Manager, Air Quality Solutions Exchange
cacostacamargo@c40.org

Potential Bidders can anonymously ask their questions publicly [here](#). Questions must be submitted by May 28. Answers to questions will be provided on the same link on May 29 (see timetable).

On the basis of the applications received, C40 reserves the right to promote the establishment of consortium relationships or to ask potential Bidders to refine their applications after receipt.

Have a concern?

C40 is committed to the highest standards of ethical behaviour. As such, we are committed to being open and responsive to complaints and suggestions on how we can improve from outside the organisation. Please refer to [C40 Complaints Procedure](#) on how to reach us.

11. Disclaimer

C40 will not accept any liability or be responsible for any costs incurred by Potential Suppliers in preparing a response for this RFP. Neither the issue of the RFP, nor any of the information presented in it, should be regarded as a commitment or representation on the part of C40 (or any of its partners) to enter into a contractual arrangement. Nothing in this RFP should be interpreted as a commitment by C40 to award a contract to a Potential Supplier as a result of this procurement, nor to accept the lowest price or any tender.

12. Annex A

Instructions to Bidders: Please indicate whether your proposal includes each requested item by checking the "Included" column in the **Technical Compliance Spreadsheet**. If an item is "Partially Included" or requires further explanation, please provide specific details in the "Bidder Comments" column.

The **Technical Compliance Spreadsheet** is available for download [here](#).

13. Annex B

This section outlines the desired hardware and software specifications, which serve as a strategic guide for developing your proposal. While we recognize that different sensing technologies offer unique value propositions, the criteria below represent a balanced synthesis of the requirements identified across all 14 participating cities.

Guidance for Proponents:

- **A Framework for Balance:** These specifications represent the "ideal" configurations informed by the cities. We understand that a final proposal involves a balance of options, and that certain features may need to be prioritized over others to remain within the budget.
- **Advanced vs. Basic Features:** We recognize that some of these requirements - particularly regarding multi-gas sensing, and enhanced power autonomy - may be available solely in more advanced sensor models (such as those described in Option 2 of Work Package 1).
- **Comparing Models:** If you are offering multiple sensor types, please use this list to show us the differences between them. We want to see which features are included in your "Basic" models and which extra capabilities are added if we move to an "Advanced" model.

Air Quality Sensor Specifications

Measurement Capabilities

- High-accuracy measurement of particulate matter (**PM2.5 and PM10**).
- Temperature and relative humidity to assist in data normalization.
- Integration of gas sensors for **NO2, O3, and CO**.

Measurement Parameters

- **PM2.5 and PM10:** Accuracy $\pm 5 \mu\text{g}/\text{m}^3$; Range 0–1,000 $\mu\text{g}/\text{m}^3$; Resolution 1 $\mu\text{g}/\text{m}^3$; Minimum Detectable Concentration 1 $\mu\text{g}/\text{m}^3$.
- **Temperature:** Accuracy $\pm 0.5 \text{ }^\circ\text{C}$; Range $-10 \text{ }^\circ\text{C}$ to $+50 \text{ }^\circ\text{C}$; Resolution 0.1 $^\circ\text{C}$.
- **Relative Humidity:** Accuracy $\pm 3\%$; Range 0–100%; Resolution 0.1%.
- **Gas Sensors:** NO2 0–500 ppb, accuracy ± 10 ppb; O3 0–500 ppb, accuracy ± 10 ppb; CO 0–50 or 100 ppm, accuracy ± 1 ppm.

Dual Connectivity & Data Management

- **Wi-Fi & Cellular:** Support both wi-fi (2.4GHz/5GHz) and cellular connection (4G/LTE with 3G/2G fallback).

- **Internal Memory:** Store data locally if the connection fails, automatically syncing and uploading all stored data once reconnected to ensure no data loss. *Please explicitly specify the maximum storage capacity of the device in the proposal.*
- **Failover Capability:** Automatic switching between wi-fi and cellular to prevent data gaps during network outages.
- **Connectivity Loss Alerts:** Trigger notification if a device goes offline due to connectivity loss or malfunction.
- **Secure Messaging:** Data transmission to the cloud/server should utilize secure protocols such as MQTT or HTTPS.

Detectability & Responsiveness

- **Response time:** pollutant changes detected within 1–5 minutes.
- **Transmission reliability:** packet loss not exceeding 1%.
- **Internal memory recovery:** 100% of stored data synced after reconnection.
- **Humidity compensation:** particulate accuracy at >90% RH.

Power Supply and Autonomy

- **Dual Power Options:** Operating via a standard plug-in power source (AC/DC).
- **Solar:** Units may include an integrated solar panel and battery system for autonomous deployment.
- **Acceptable Voltage Range:** Support a wide input voltage range to ensure compatibility with varied urban infrastructure.
- **Battery Backup:** Regardless of the primary power source, units should include an internal backup battery for at least 48–72 hours of continuous operation during power failures.

Durability and Security

- **Weatherproofing:** Fully outdoor-rated and weatherproofed (sealed against dust, dirt, heavy rain, and wind).
- **Operating Range:** Remain fully operational in extreme temperature environments.
- **Longevity:** A guaranteed operational lifespan and product warranty of at least 2 years. Proposals must specify if sensor modules are field-replaceable (modular/plug-and-play) or if the entire unit must be returned to the manufacturer for servicing.
- **Theft/Vandalism Resistance:** The mounting hardware should be robust or include security screws to deter theft or tampering.

Calibration, Reporting & Replacement

- **Real-Time Transmission:** Capability to provide data at configurable intervals (e.g., every 1–15 minutes).
- **Verified Accuracy:** Sensors must be factory-calibrated; the Supplier should provide individual calibration certificates for each unit.
 - **Recalibration Procedures:** Detail the recommended recalibration interval and the procedure for maintaining accuracy over the device's lifespan.
 - **Drift Specification:** Is preferential that the proposal specifies the maximum expected sensor drift per annum for each measured parameter.
- **Remote Management:** Capability to check sensor "health" (battery levels, signal strength) and perform firmware updates remotely.

- **Factory calibration:** Traceable certificates for each unit, performed against reference-grade analyzers.
- **Pre-deployment verification:** calibration within 3 months of shipment.
- **Re-calibration:** annual recalibration or sooner if drift exceeds $\pm 10\%$.
- **Remote calibration support:** zero/span checks and firmware updates.
- **Drift limits:** PM $\pm 5 \mu\text{g}/\text{m}^3$; gases $\pm 5\%$ of full-scale; temperature $\pm 0.5 \text{ }^\circ\text{C}$; humidity $\pm 3\%$ RH.
- **Calibration data management:** certificates uploaded to dashboard, audit trail maintained, automatic alerts for recalibration due.
- **Coastal-specific calibration:** account for salt particle interference, high humidity scenarios, and rapid storm-related changes.
- **Replacement Requirement:** Replacement schedules, cost estimates, and safe disposal procedures for any sensors requiring annual electrochemical cell (ECC) replacement. Please note that sensors capable of recalibration and modular replacing are strongly preferred.

Dashboard Functionality and Visualization

- **Real-Time Map:** A geospatial visualization showing the location and current status (e.g., color-coded by Air Quality Index) of all deployed sensors.
- **Data Visualization Tools:** Capability to generate time-series graphs, heatmaps, and comparison charts for different pollutants (PM2.5, PM10, etc.) and timeframes (hourly, daily, monthly).
- **Metadata Management:** The ability to add and edit information for each sensor location, such as installation height, street address, and photos of the installation site for future maintenance reference.
- **Additional metadata:** The ability to include calibration history, maintenance records, and sensor model/version, to support long-term data management and traceability.
- **User Management and Security:** Administrative panel to manage user permissions. The system should support multiple user roles (e.g., **Admin** for full control, **Editor** for site metadata, and **Viewer** for data analysis only).
- **Authentication mechanisms:** The ability to secure authentication mechanisms (e.g., multi-factor authentication or role-based access policies) to strengthen system security.
- **Device Health Monitoring:** A "System Health" view showing real-time connectivity status, battery levels, and signal strength for every sensor in the network.
- **Automated Alerts:** The ability to configure custom notifications (via email, SMS, or API) when specific pollutant thresholds are exceeded or when a device goes offline, and alert history logs to support operational monitoring and reporting.

Data Access and Export

- **Data Exports:** Exports should support standard data formats (e.g., CSV, or Excel) and include timestamp, sensor ID, location metadata, and data quality indicators to facilitate analysis and interoperability.
- **Historical Storage:** The platform should store and provide access to the full history of collected data.
- **API Access:** The Supplier shall provide an API (Application Programming Interface) to allow cities to integrate the air quality data directly into their own websites or third-party environmental software.
 - The API should be well documented and support standard data exchange formats, enabling integration with external applications, research platforms, and smart city systems.
- **User Management:** The platform should allow for different levels of user access (e.g., "Admin" for

city leads and "Viewer" for general staff).

- **Language Support:** Dashboard interface available in **English, Spanish, Portuguese, Swahili and French**.

Public-Facing Visualization for Citizens

- **Public Web Map:** The system can include a mobile-responsive, public-facing map that utilizes geolocation to provide residents with real-time, color-coded air quality data (and desirable health recommendations) based on their current physical location.
 - Clarify which Air Quality Index standard will be used to ensure consistency and comparability of public information.
- **Health-Based Color Coding:** Data can be presented using a standard Air Quality Index (AQI) or a similar color-coded scale (e.g., Green for Good, Red for Unhealthy) to make the information easy to interpret at a glance.
- **Health Recommendations:** The platform can include basic health advice based on the current pollution levels (e.g., "Good day for outdoor activities" or "Sensitive groups should reduce outdoor exercise").
- **Embeddable Widgets:** The Supplier can provide a "widget" (e.g. API-based embedding) or an easy way for the city to embed the real-time air quality map or specific sensor readings directly onto the official City website.
- **Multilingual Interface:** Like the expert dashboard, the public visualization must be available in the city's local language (English, Spanish, Portuguese, Swahili and French).