



Urban Air Quality Management Course: Monitoring Networks, AQI and Clean Air Plans



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Introduction:

Urban air quality management, covering monitoring networks, the Air Quality Index AQI and clean air plans, is a 1-week course for municipal environment, environmental authority and public health staff that ends with a City Clean Air Action Plan for a case municipality. Cities run stations that miss traffic hotspots, publish index values without health advice and adopt measures without knowing which sources drive local pollution. Nominees already oversee city air data, permits or health advisories, and the course is taught through case studies on network, inventory and receptor data. CoreConcept Training Center delivers this urban air quality management course.

Course Objectives:

- Design a city ambient monitoring network that places traffic, urban background and suburban stations against population exposure and data capture targets
- Evaluate low-cost sensor deployments by co-locating them with reference analysers and correcting them for humidity and drift
- Calculate AQI sub-indices from averaged pollutant concentrations and issue banded health messages for sensitive groups and episode days
- Compile an urban emissions inventory for road traffic, residential, construction, commercial and small industrial area sources
- Interpret dispersion and receptor model results, including positive matrix factorization and chemical mass balance, to attribute measured particulate to source sectors
- Prioritise traffic, industry, construction dust and green infrastructure measures within a City Clean Air Action Plan with indicators and stakeholder roles

Target Audience:

- Municipal staff responsible for environmental health, air quality reporting and urban environmental programmes
 - Environmental authority staff responsible for ambient monitoring stations, air quality data publication and episode response
 - Public health staff responsible for health advisories, vulnerable group guidance and exposure surveillance
 - Transport and urban planning staff responsible for traffic schemes, zoning and green space that shape city exposure
 - Policy and planning staff responsible for preparing, funding and tracking clean air measures across city departments
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Course Outline:

Day 1: Urban Air Pollution Context and City Exposure Baseline

- PM2.5, PM10, NO2 and Ozone Health Effects Profile
- Urban Pollutant Sources From Road Traffic to Construction Sites
- Ambient Air Quality Standards and Averaging Periods Compared
- City Exposure Hotspot Mapping Along Corridors and Schools
- Current City Air Quality Management Maturity Self-Assessment

Day 2: Monitoring Network Design, Sensors and the AQI Method

- Station Classification for Traffic, Urban Background and Suburban Sites
- Network Density Planning Against Population Exposure and Area
- Reference Analyser Data Capture and Ratification Routines
- Low-Cost Sensor Co-Location, Humidity Correction and Drift Checks
- AQI Breakpoints, Sub-Indices and Dominant Pollutant Calculation

Day 3: Emissions Inventories, Public Alerts and City Reporting

- Bottom-Up Road Traffic Emission Estimates From Fleet Counts
- Residential, Commercial and Small Industrial Area Source Estimation
- Construction and Resuspended Road Dust Emission Factors Worksheet
- Banded Health Messages and Episode Alert Triggers for Sensitive Groups
- Public Air Quality Dashboard and Annual City Report Design

Day 4: Source Apportionment, Dispersion Modelling and Measure Appraisal

- Positive Matrix Factorization Factor Interpretation for Urban Particulate
- Chemical Mass Balance Source Profiles and Fit Diagnostics
- Street Canyon and Urban Dispersion Model Scenario Runs
- Low Emission Zone Design, Enforcement and Evaluation Evidence
- Green Infrastructure, Dust Suppression and Industrial Permit Measures Appraisal

Day 5: Case Study Work on a City Clean Air Action Plan

- Case Municipality Monitoring Data and Inventory Review
 - Case Source Contribution Ranking for Particulate and Nitrogen Dioxide
 - Case Measure Shortlist With Cost and Exposure Reduction Estimates
 - Indicator Set, Stakeholder Roles and Department Responsibility Matrix
 - City Clean Air Action Plan Completion and Peer Challenge
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Skills You Will Gain:

- Monitoring Network Planning
- Sensor Data Correction
- AQI Calculation
- Urban Emissions Inventory Compilation
- Receptor Model Interpretation
- Urban Dispersion Scenario Analysis
- Clean Air Measure Appraisal
- Cross-Department Air Quality Coordination

Why Attend This Course:

- Present a City Clean Air Action Plan for a case municipality to the head of environment and the public health director for endorsement
- Decide which neighbourhoods need new stations or sensors and which sources deserve traffic, dust or permit measures first
- Avoid spending on low emission zones, sensor fleets or greening schemes that do not cut the pollutants driving local exposure
- Equip monitoring, health and planning colleagues with station siting criteria, AQI calculation sheets and inventory templates

Conclusion:

Back at work, the participant presents the City Clean Air Action Plan to the head of environment, the public health director and the transport and planning leads who own the measures. The plan supports decisions on where to extend the monitoring network, how to word index alerts, and which traffic, construction dust, industrial and green infrastructure measures to fund first. After the first year of reporting under the plan, the unit should compare measured concentrations, alert days and measure progress against the indicators and revise priorities.

Frequently Asked Questions FAQ:

What should participants know before the urban air quality management course?

Participants should already work with city air quality data, environmental permits or health advisories and be comfortable with spreadsheets. No modelling software skill is expected. Bringing anonymised station data, an existing inventory or a draft city plan helps the case studies reflect their own city.

How does urban air quality management differ from industrial site environmental monitoring?

It works at city scale for public authorities. Industrial monitoring courses cover stacks, emission analysers and site sampling for one plant, while this course covers city station networks, sensors, the AQI, citywide inventories, source apportionment and measures across traffic, construction, industry and green space.

Why does urban air quality management need source apportionment before choosing measures?

Source apportionment shows which sectors actually drive measured particulate and nitrogen dioxide at each station. Without it, cities risk funding traffic or greening schemes while construction dust, residential burning or industrial areas remain the main contributors to exposure.

What do participants take back from the urban air quality management course?

Participants take back a City Clean Air Action Plan for a case municipality, with a network siting review, an AQI calculation and alert sheet, an emissions inventory worksheet, a source contribution ranking and a prioritised measure list with indicators and department roles.