AIR MONITORING - DATA & INTELLIGENCE

BUSINESS & SOLUTION SHOWCASE

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MONITOR AIR
ANALYZE INSIGHTS
IMPROVE ENVIRONMENT

Monitor ANYWHERE

ABOUT ESI

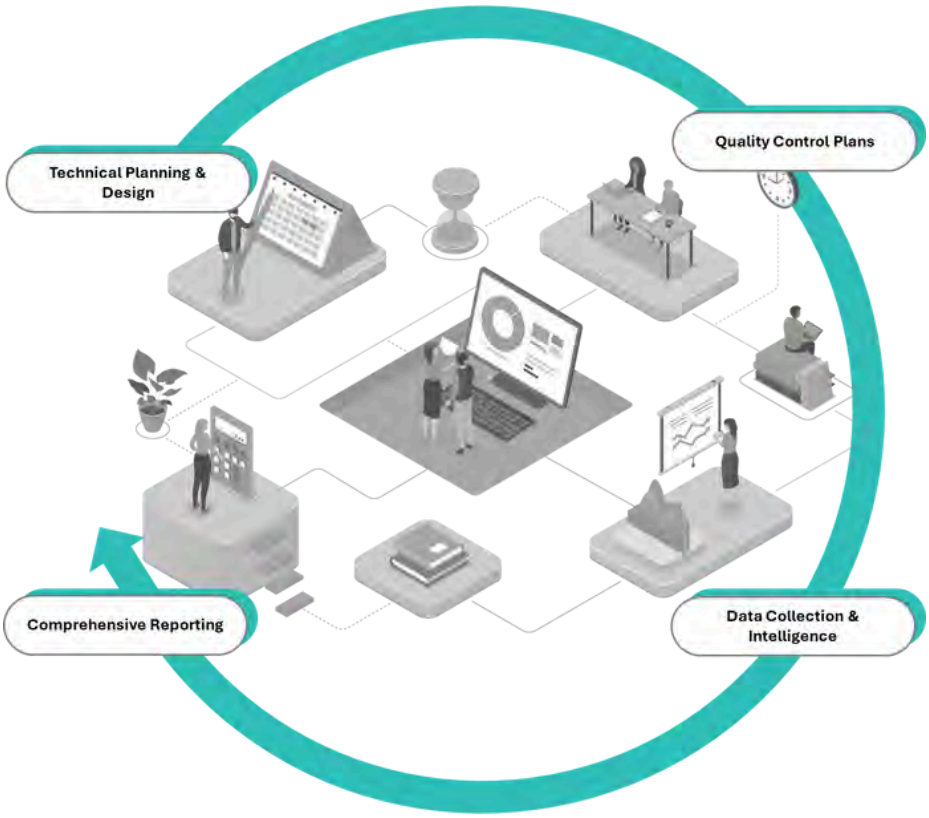
Ecosystem Informatics Inc. offers comprehensive end-to-end solutions, bridging gaps in data availability, integration, and usability, from sensing to intelligence. Catering to sectors such as government bodies, industries, environmental justice, and academic research, our systems provide real-time data collection and monitoring, automated alarms and notifications, and a suite of advanced analytics.

Our advanced data collection equipment features easy installation, operation, and maintenance while enabling continuous, accurate monitoring with low power consumption, making them ideal for diverse environments. Our solutions can be deployed not only in stationary configurations, but also on mobile or aerial platforms, allowing for extensive data collection over large areas at a fraction of the cost of traditional solutions.

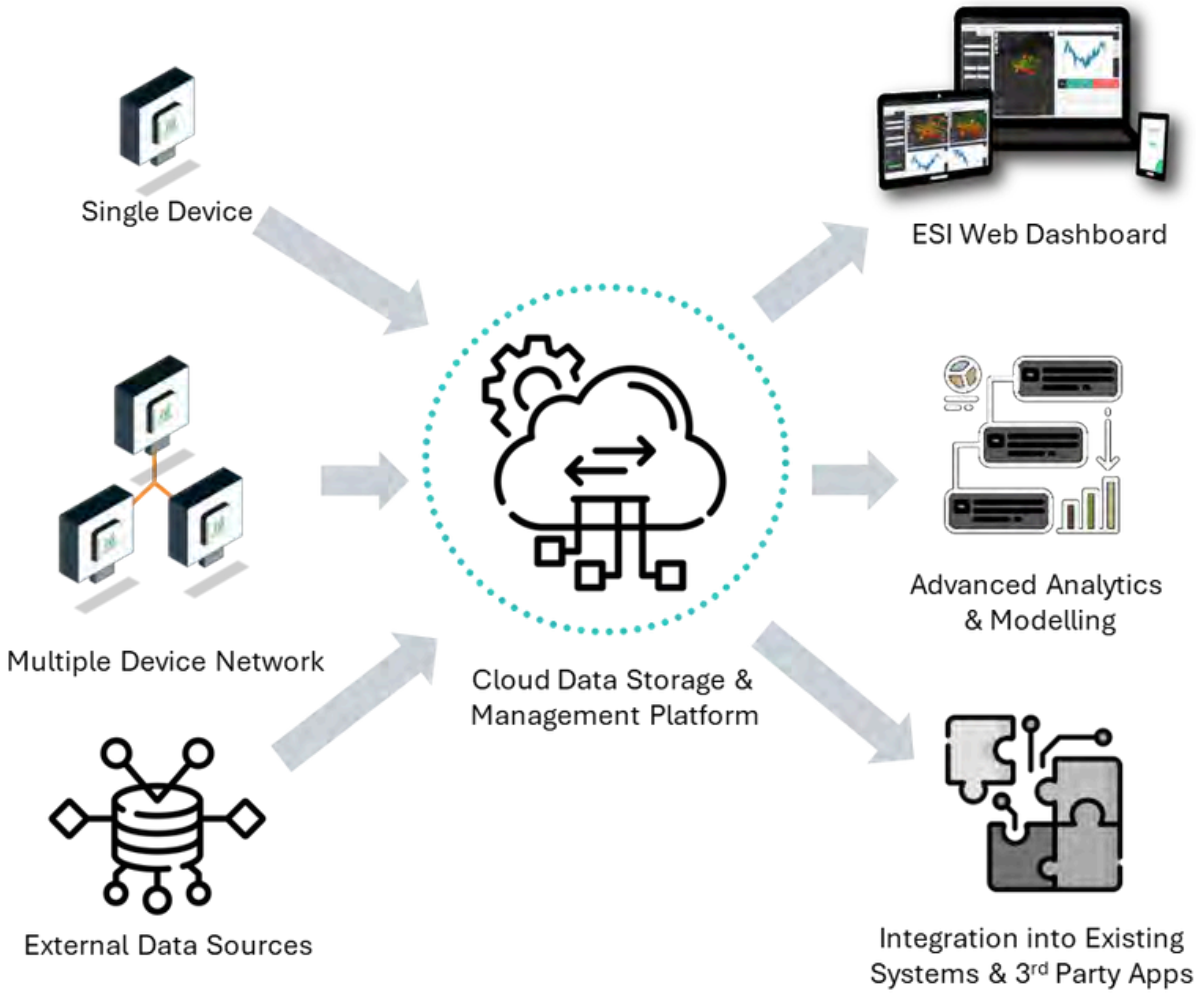
Our patented AI algorithms work their magic in the cloud, continuously calibrating the data in real-time. This not only enhances the accuracy and reliability of the data but also minimizes the need for regular maintenance and physical calibration, thereby further reducing costs.

SERVICES

- Hyperlocal Air Quality Monitoring (For full list of pollutants monitored, please consult our Technology Catalogue).
- Meteorological conditions (Wind speed/direction, RH, temperature)
- Odours - tracking and source identification
- Noise and Vibration Monitoring
- Mobile Monitoring units (vehicle and drone-mounted) and fixed sensor networks
- Sensor-based spill response support (pollution detection & confirmation)
- Web-based dashboards for visualization, alerting, reporting
- APIs for Data Access and Integration
- Historical trend analysis and hotspot mapping
- Predictive modeling using tools such as AERMOD, CAL3QHC, and EPA's MOVES
- Customized sustainability metric tracking and automated reports
- Provide dynamic reporting templates that streamline the generation of routine environmental updates
- Integration of real-time air quality -pollutants and GHGs data with broader ESG and regulatory reporting needs
- GIS integration and 3D/2.5D spatial mapping



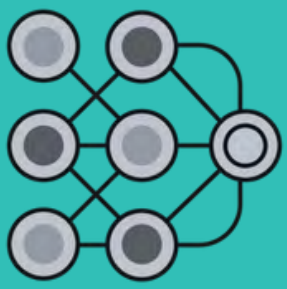
SOLUTION



End-to-End Service Platform

ESI's PATENTED ADVANTAGE

Software Calibration Using Patented AI Algorithms



Multiple Generations of Algorithms Developed:

- Initial approach: near reference calibration
- Advanced approach: predictive calibration

Significant cost, maintenance, and resource advantages compared to hardware calibration.

Multi-layered calibration from source OEM to ESI in-lab and continuous software calibration, addressing issues like sensor drift resulting in superior accuracy & reliability over low-cost sensors.

DATA & INTELLIGENCE

Web Dashboard (SaaS)

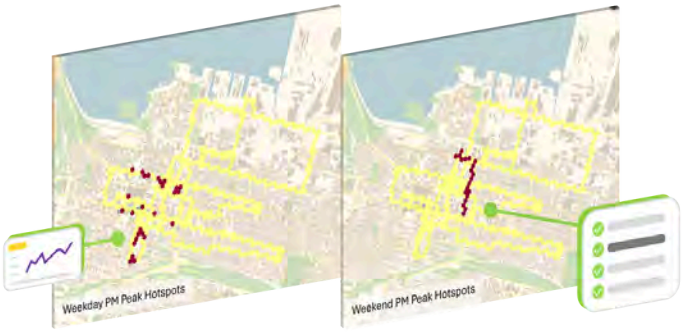
FIWARE | FIWARE-Ready

Data APIs (DaaS)

Advanced Analytics

Custom Integration

OUTCOME SPOTLIGHTS



Customer Stories

Urban Monitoring – Public Health

Client : City of Hamilton, Ontario, Canada

Context

- City of Hamilton was experiencing elevated odour complaints and concerns over Air Quality in the city's downtown core with several Public complaints from areas closer to the port.

Requirement

- Air Quality data collection and odour hotspot and source identification, within a 25 SQKM. Area of interest with focus on critical locations like hospitals and green spaces.

Solution

- Mobile Monitoring of Area of Interest over several seasons with units deployed on ESI vehicles.
- Spatial Analysis for Hotspot identification.
- Critical Location Monitoring, Analysis & Reporting.

Result

- Establishment of Pollution and Odour Hotspots.
- Critical Location identification and Monitoring.
- Comprehensive Public Health initiative analysis.

Customer Stories

Infrastructure Planning

Client : City of Hamilton, Ontario, Canada

Context

- City of Hamilton planned a downtown core emissions and odour reduction initiative by changing truck routes to bypass certain city areas.

Requirement

- Impact Assessment of Pollution reduction initiative and actions.

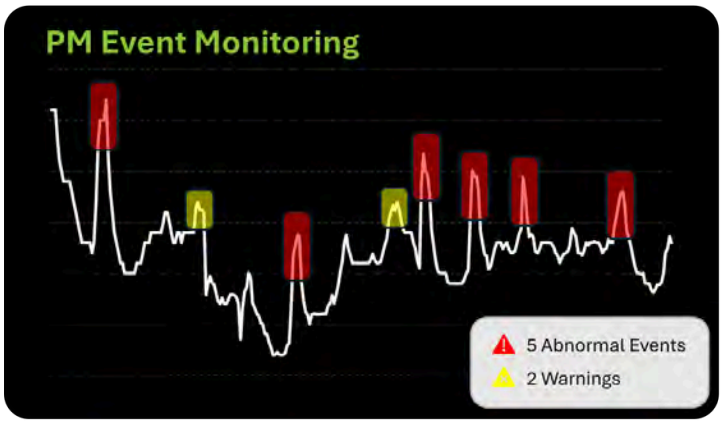
Solution

- Create a baseline of ambient air level pre-initiative.
- Data collection and analysis post-initiative execution to understand differences in air quality levels along truck route corridor.

Result

- Impact Analysis and comprehensive reporting of Action-Effect analysis for pollution and odour reduction Initiatives.
- Enabling Informed decision making and policy creation.

OUTCOME SPOTLIGHTS



Customer Stories

Wildfire Remediation

Client : Arcadis (Site: Village of Lytton, British Columbia, Canada)

Context

- Village of Lytton was devastated by Wildfire and was looking for continuous dust monitoring to inform authorities during wildfire remediation efforts.

Requirement

- Air Quality data collected at strategic locations and continuously monitor dust levels.

Solution

- Two ESI units deployed north and south of Lytton to measure dust concentration.
- Real-time PM monitoring for event identification and Health and Safety Alerts.

Result

- Effective dust monitoring and event identification.
- Comprehensive insights and real-time alerts.

Customer Stories

Smart City Technology Integration

Client : City of Tallinn, Estonia

Context

- City of Tallinn, Estonia integrating a new smart city platform that is being developed by Arcadis.

Requirement

- 24*7 Monitoring and data, Integration into smart city platform.
- Large and comprehensive coverage.

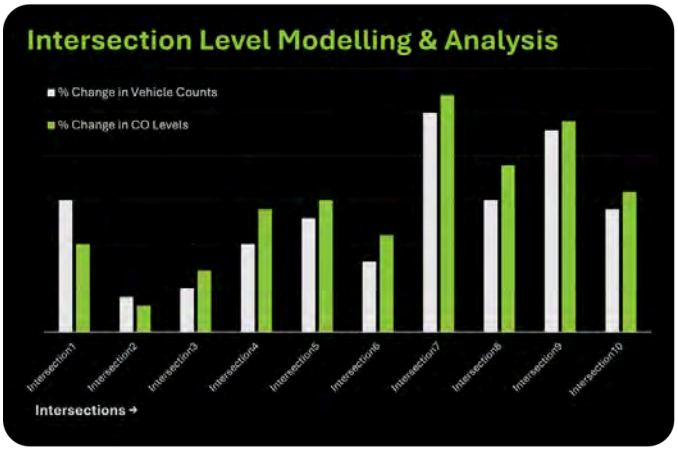
Solution

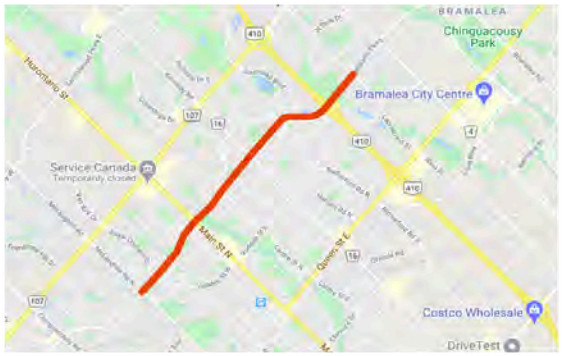
- Stationary & Mobile data collection of pollutants and odour causing substances.
- Real-time mobile data collection device deployed on streetcar.
- Smart City Integration.

Result

- Innovative low maintenance data collection.
- Data integration into smart city platform.
- Advanced Analytics like pollutant hotspots and heat islands.

OUTCOME SPOTLIGHTS





Customer Stories

Urban Mobility Planning & Impact Analysis

Client : City of Brampton, Ontario, Canada

Context

- City of Brampton was planning to expand a major roadway as part of their Vision 2041 Infrastructure expansion planning.

Requirement

- Scenario Construction & Modelling for Impact Analysis.

Solution

- Multi-Scenario Air Quality Impact Modelling and Impact Analysis.
- EPA MOVES modelling for transportation emissions.

Result

- Impact analysis for informed decision making on roadway expansion.
- Comprehensive Insights from Multi-Scenario and intersection Modelling.

Customer Stories

Transportation Planning

Client Town of Milton, Ontario, Canada

Context

- Town of Milton planning to upgrade public bus fleet to electrified buses.

Requirement

- ROI Analysis and Environmental Impact of bus electrification.

Solution

- Automated data capture with units on buses for establishment of ambient air level baseline.
- EPA MOVES modelling for transportation emissions and custom scenario modelling for cause-effect analysis.

Result

- ROI demonstration with Environmental Impact analysis and reporting.
- Comprehensive analysis Milton's air quality based on collected data.

OUTCOME SPOTLIGHTS

Customer Stories

Mine Perimeter Monitoring

Client: Arcadis Group (Site: Chino Mine, New Mexico, USA)

Context

- Address surrounding community complaints on odours and air quality from operations at Chino Mine, New Mexico.

Requirement

- Baseline measurements to aid large-scale project design.

Solution

- Perimeter mobile monitoring.
- Baseline measurement and benchmark with regulatory equipment.

Result

- Effective monitoring in compliment with regulatory equipment.
- Community impact mitigation planning and directional trends for regulatory monitoring plan.

Customer Stories

Cement Manufacturing Impact Analysis

Client: Cement Manufacturer, Ontario, Canada

Context

- Ontario based Cement Manufacturer wanted a deeper understanding on the emissions – both pollutants and odorous compounds - from a manufacturing plant that is adjacent a major highway.

Requirement

- Impact Assessment of Emissions from primary stack and other sources.
- Data Collection with a wide area coverage.

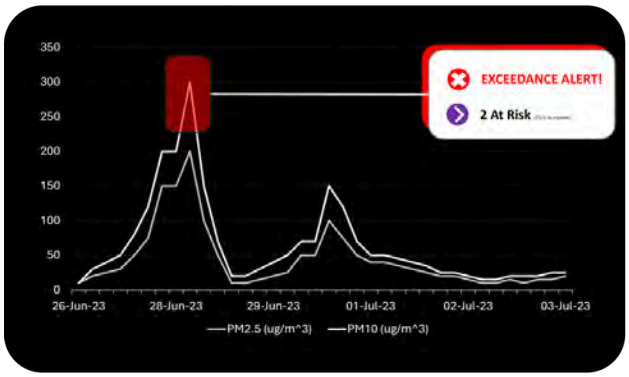
Solution

- Drone deployment for data collection.
- Real-time data collection and comprehensive analysis.

Result

- Innovative technology with Comprehensive Data collection.
- Understanding of surrounding community impact.

OUTCOME SPOTLIGHTS



Customer Stories

Construction Site 24*7 Fenceline Monitoring

Client : Metrolinx Canada (Site: Aurora, Ontario, Canada)

Context

- Construction work in a suburban area. Local by-law required continuous PM monitoring.

Requirement

- Real-Time PM Monitoring at a construction site.
- Threshold Exceedance Alerts & Source Identification.

Solution

- Monitoring design, operation and maintenance.
- Comprehensive PM monitoring & automated threshold exceedance alerts.

Result

- 24*7 real-time Monitoring.
- Configurable Threshold exceedance Alerts & Notifications.

Customer Stories

Data for Academic Research

Client: McMaster University, Canada

Context

- McMaster University's research team aimed to enhance their urban mobility research model with high-resolution data related to air quality and emissions in urban environments.

Requirement

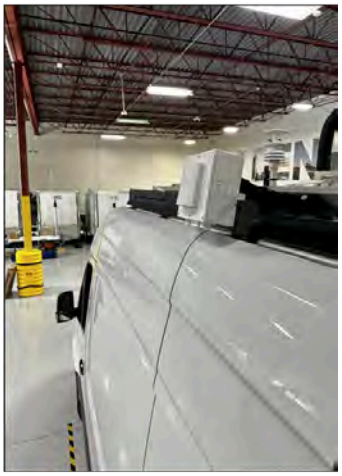
- Access to a broad data set covering different pollutants and environmental conditions across multiple locations.
- Data Integration for developing and refining analytical models.

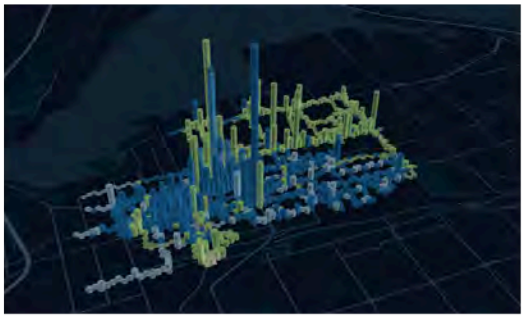
Solution

- Collaborative approach: ESI worked with McMaster University to ensure seamless data integration and interpretation for research purposes.

Result

- Model Improvement: ESI's data supported cutting-edge research, contributing to broader academic understanding of air quality dynamics in urban environments.





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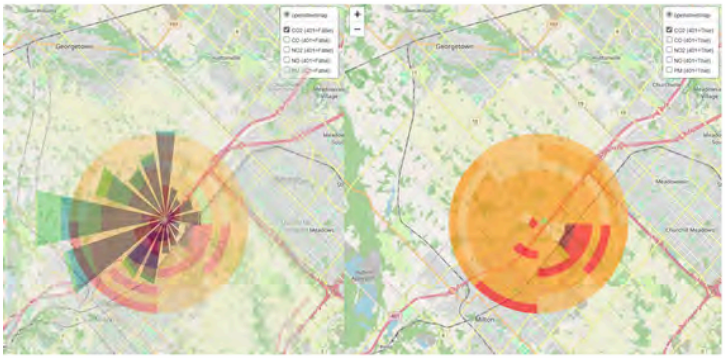
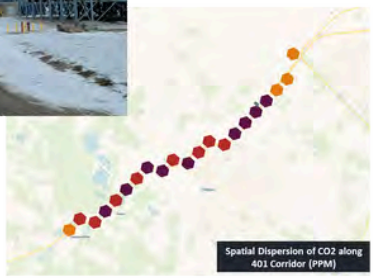




Customer Stories

Industrial Facility Air Quality Impact

Client : Utilities Provider, Ontario, Canada

Context

- Atura Power needed air quality monitoring to distinguish facility emissions from Highway 401 traffic and other surrounding facilities around the Town of Milton.

Requirement

- Fixed & mobile monitoring for accurate air quality tracking.
- Data modelling and analysis for public engagement.

Solution

- 4 fixed monitors at facility boundary (N, S, E, W) – 24/7 data collection.
- 3 mobile monitors on ESI vehicles covering buffer zones & 401 corridor.
- 10 data collection days/month across AM, PM, and off-peak periods.

Result

- Accurate emissions dataset for source attribution.
- Data-driven impact assessment.
- Improved public transparency & engagement.

Customer Stories

In-Service Mobile Emissions Measurements

Client: City Transport Authority, USA

Context

- Evaluate public transit bus emissions while bus is in regular operation. The primary challenges are to manage the high temperatures of the bus tailpipe exhaust and measure while the bus is in-service.

Requirement

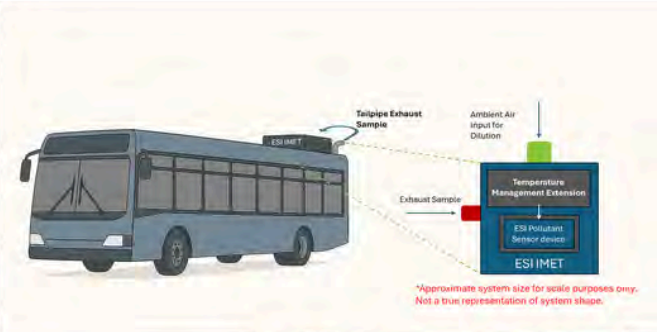
- Capture accurate tailpipe emissions during normal bus operation across diesel and hybrid fleets.
- Assess overlooked emission sources like auxiliary heaters and evaluate emissions variability across conditions.

Solution

- ESI's In-Service Mobile Emissions Testing (IMET) system was deployed directly on transit buses to manage high temperature exhaust and measure tailpipe emissions in real time along regular service routes.
- Supplemental tests included heater emissions and flow rate analyses for full-spectrum evaluation.

Result

- Groundbreaking Insights: The study delivered a high-fidelity assessment of real-world bus emissions, informed emissions benchmarking, and guided strategies for fleet-wide emission reduction and operational improvements.



GROWING GLOBAL PRESENCE

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Shirook Ali, Founder and CEO

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FIWARE FIWARE-Ready