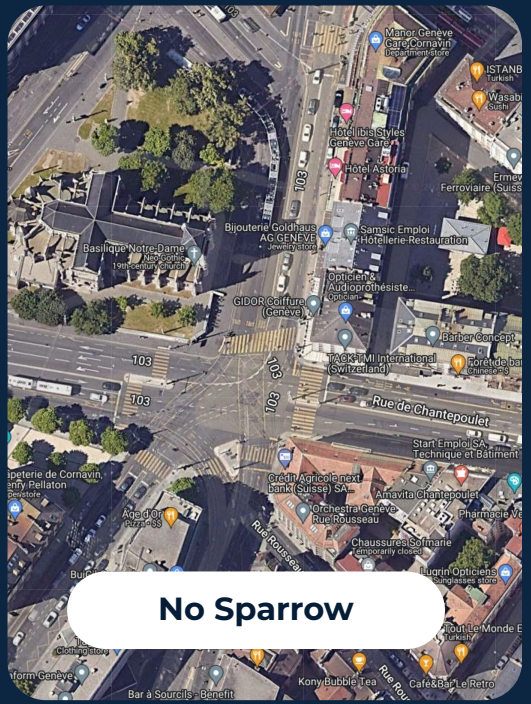
Why Sparrow is a must-have?

Nonstop **detection**, **monitoring**, and **analysis** are required



Cities will be able to

- Identify "hot spots" and "green areas"
- Get real-time, street-level big data
- Make data-based decisions
- Resolve pollution problems
- Propose measurable actions
- Predict and forecast with AI insights
- Communicate effectively with citizens
- Minimize the risk of innovations
- Integrate data-driven solutions

Benefits for citizens

- Move around the city in a healthy way
- AQ-based sports and family activities
- Achieving NetZero levels city-wide
- Winning community engagement and support

... making cities a better place to live in

Sparrow methodology

Detect • Monitor • Analyse

Street-level pollution data acquisition in real time round the clock - Big Environmental Data

Detection

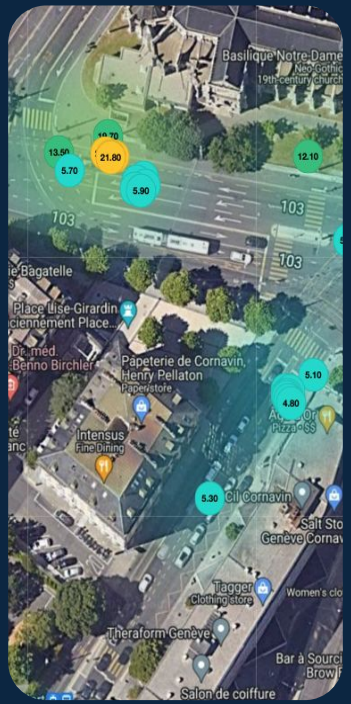
- Air pollution, greenhouse gas hotspots
- Road quality, bumps and potholes
- Noise levels and noisy occurrences
- Commonalities of urban environments

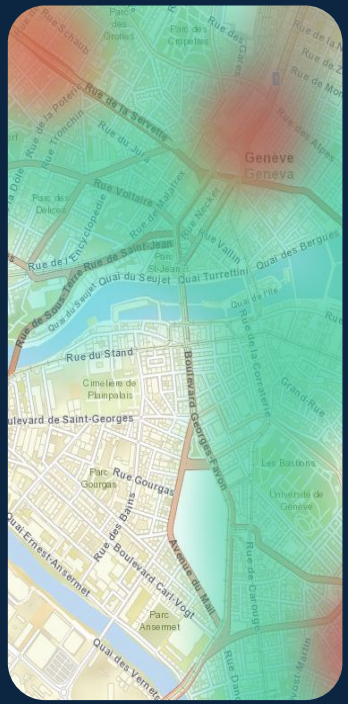
Monitoring

- Pollution source identification
- Pollutant behavior tracking
- Anomalies verification

Analysis

- Urban Big Data analysis
- Data-specific analytical tools
- Forecasts and predictions





- **Detection**

We design and build networks of mobile sensors to scan cities, collect and analyse environmental data

Detection

Sparrow Node - Hardware

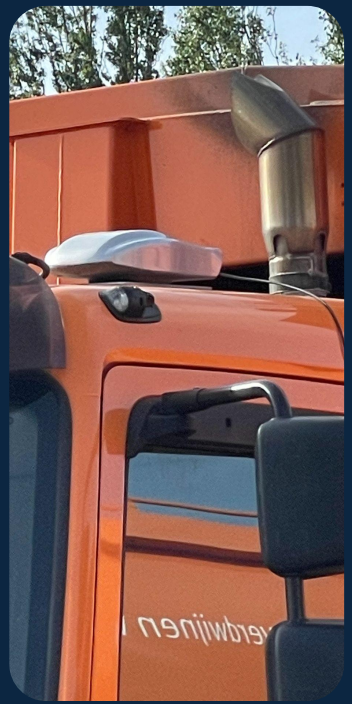
- Easy "Plug & Forget" vehicle mounting
- Use any circulating public transport
- Immediate data collection and results

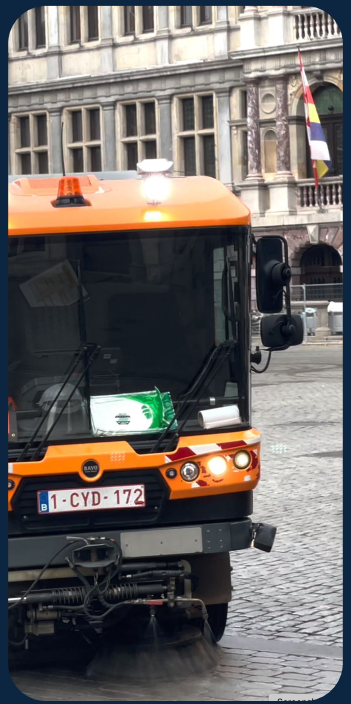
GPS + Time + Parameters

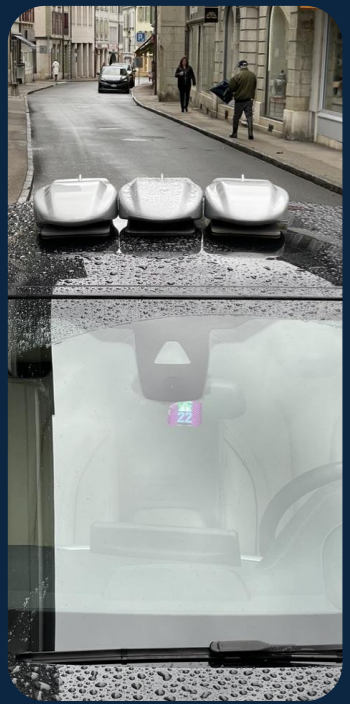
- Precise GPS coordinates
- Each sampling is time-stamped
- Various data sets (air, roads, noise ...)

Map of City Hotspots

- Real-time and historical data
- Custom maps with "heat islands"
- Integrated API for existing maps





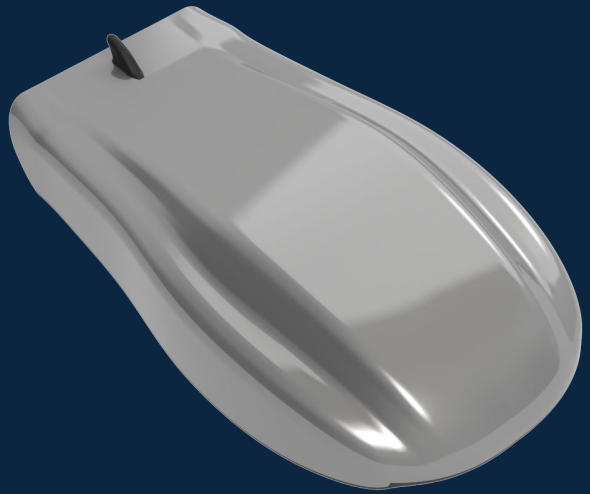


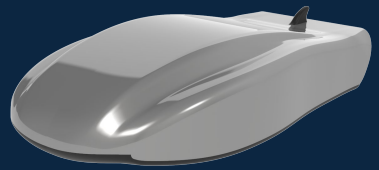
- **Sparrow Node**

We equip any public transport with a Sparrow Node. By linking the GPS position and Timestamp for each measurement, we create a highly accurate environmental map of the city

Sparrow Node

Sparrow Node Detects





Air Pollution

- Particulate Matter: PM 1, PM 2.5, PM 10
- Toxic Gases: NO2, O3, CO2, CO
- Temperature
- Relative Humidity
- Atmospheric Pressure

Road Quality

- Determining surface smoothness (IRI)
- Bumps and potholes detection (SDV)

Noise Pollution

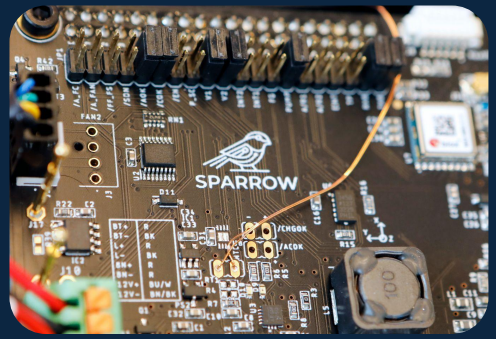
- Exposure and noise mapping
- Noisy event detection

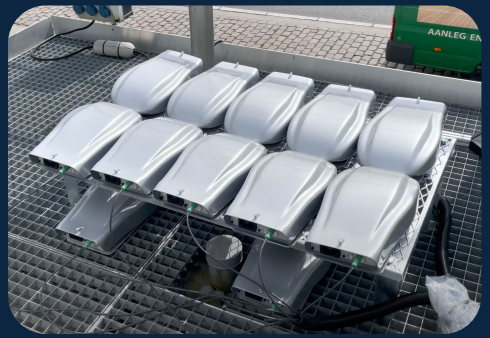
System info

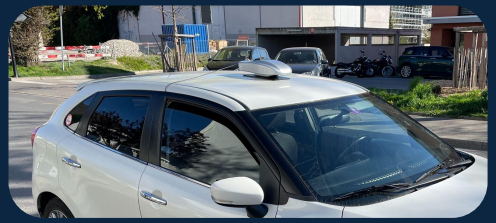
- Accelerometer Data
- Precise GPS and Timestamp
- 3/4/5G Quality of the Network
- Measurement Interval: Gas-1 min., PM-1 sec.
- Operational from -30 up to +50 C°

Sparrow Node

Trusted data: Sparrow nodes are constantly calibrated and validated for best performance using Cities reference stations







Monitoring

City monitoring

Pollution source

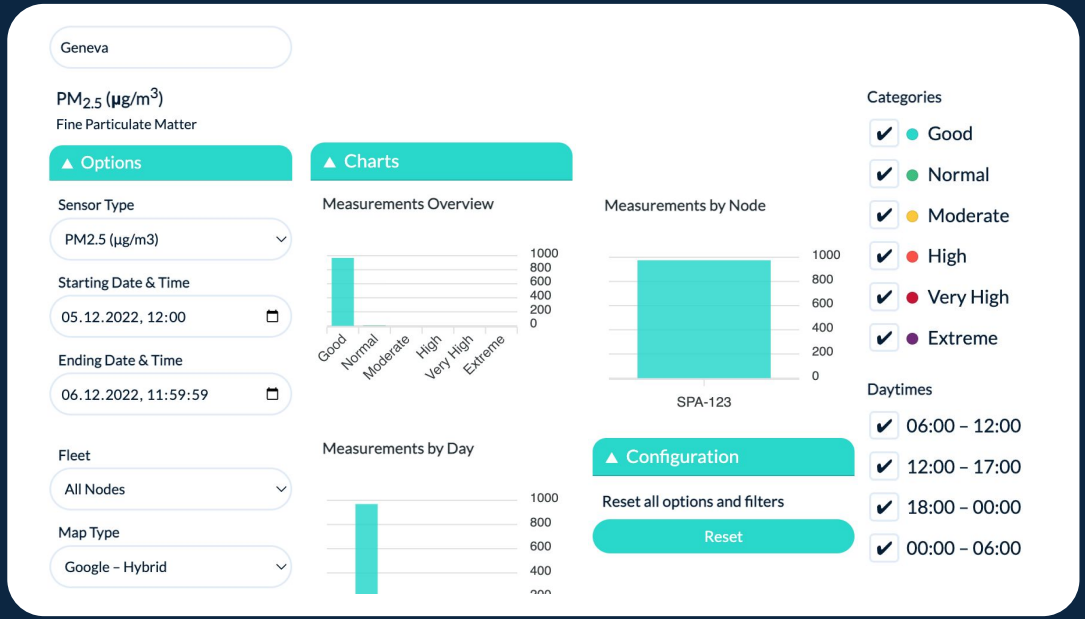
- Determining pollution source
- Particle, greenhouse and toxic gases
- Urban traffic and congestion
- Construction and industry compliance

Pollution behavior

- Tracking pollutant behavior
- Verifying anomalies
- Hotspot maps
- Pollutant definition
- Correlation modeling
- AI implementation

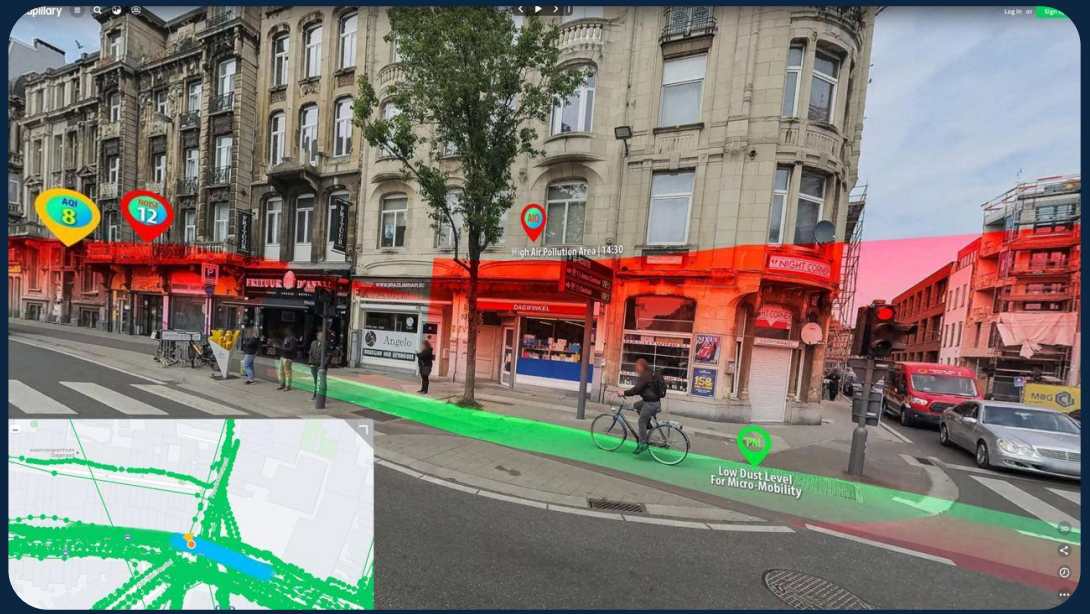
Include Big Data into city development strategy for cleaner and sustainable future

Wide range of monitoring tools



Analysis

Analyse and Include clear identification of the presence of pollution
Example: Antwerp, Belgium - Street View with Sparrow Data. April 2022



Urban Analytics

The City will have access to

- Real-time and Historical Data
- A flexible and adopted API integration
- Fully confidential and encrypted
- Supported “Open-Data” approach

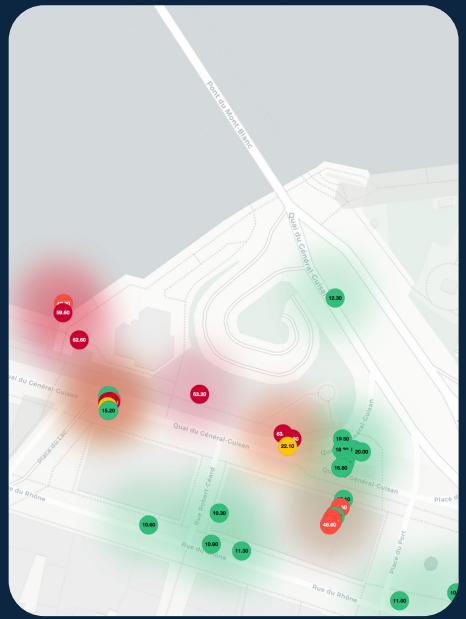
Cross sectors benefits

- Cross data approach
- Air and Noise pollution departments
- Transport and Road Quality
- Environmental Policymakers
- Forecast and Prediction

We work in complete confidentiality and trust with the municipal authorities of the City

Analysis

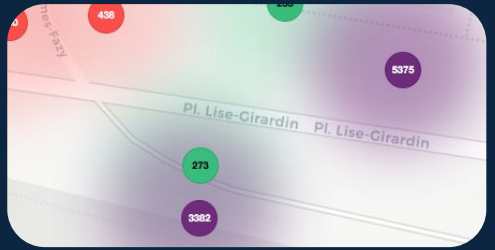
Include an important layer of Big Data for urban planning
Example: Geneva, Switzerland - Traffic Map, 2022



Use Case:
Correlation between Air pollution (PM2.5) and Road quality (Bumps, SDV)

High PM2.5 indicated

Bumps and potholes in the same area



Turnkey solution implementation

Implementation

Phase 1 “City Audit”

“City Audit” details:

- Duration: **1-3 months**
- Number of Nodes: **5-10**
- Vehicles: **City Fleet**
- **Targets**:
  1. Initial city scan
  2. Hotspot detection
  3. Data quality
  4. Calibration

Outcomes:

- AI algorithm for Phase 2 requirements
- Map with covered areas
- Across departments collaboration
- Analytics and processing
- Identification of local issues

Phase 2 “City Control”

“City Control” details:

- Duration: **1-3 years**
- Number of Nodes: **AI definition by Audit**
- Vehicles: **Entire public transport**
- **Targets:**
  1. 24/7 Scanning
  2. Multilayer detection
  3. Constant Monitoring
  4. Big Data and Analytics for the cities

Stakeholders of the Sparrow solution

Stakeholders

Government

- Cities and Urban areas
- Environmental Agencies
- Air Quality Reference authorities
- Academia and Laboratories
- Smart City departments
- Innovation Hubs
- UN sectors: ITU, UNEP, WHO.

City Integrators

- Telecom
- Infrastructure
- Engineering
- Port Management
- Construction
- Business Development

City Transport

- Pub. Transport: Busses, Trams, etc.
- Taxis and Ride-hiling cars
- Carsharing services
- Delivery services
- Postal fleets
- Micro-mobility

Feedback from the city

"... For us it can be regarded as a successful experiment in terms of the opportunities/possibilities to measure environmental hazards in the city by means of mobile sensors mounted on city vehicles..."

CTO, Antwerp City. September 2022.

Sparrow is ...

Aligned with the SDG

SUSTAINABLE DEVELOPMENT GOALS

3 GOOD HEALTH AND WELL-BEING

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

More info

ITU-T Associate Member

ITU ASSOCIATE

UNEP Partner

UNEP

Swiss made

- sparrow.city
- info@sparrow.city
- youtube.com/@sparrowdotcity