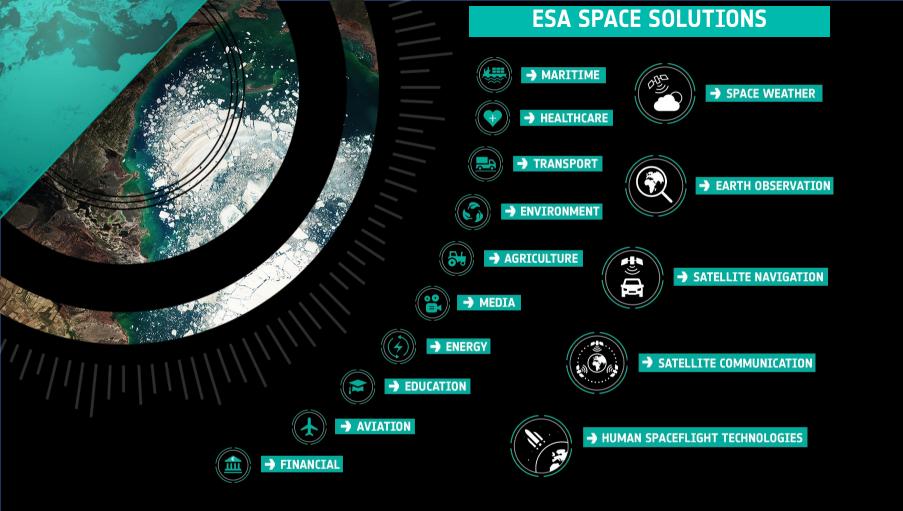


# Space for Twin Cities: Air Quality

Roberta Mugellesi

Partner-led and thematic initiatives Business Applications and Space Solutions European Space Agency

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- UMS
- HAPS
- RPAS
- VR/AR
- 5G
- IoT
- Artificial Intelligence
- Megaconstellations
- Cybersecurity
- Blockchain





## Aircheckr – Monitoring Air Pollution from Space



space solutions



- The Aircheckr Air Quality Index translates the complex set of pollutant concentrations into a health-based and easy to understand index.
- Aircheckr is focused on B2B and B2C
- Different businesses need AQ information as an input for their services. The Aircheckr API allows communication between the users' device & the Aircheckr servers.

The differences in air quality between two locations 200m apart within one day

6pm

Hourly mean Air Quality Index (AQI) on Tuesday 15 March 2016. The aircheckr AQI is a health-based indication on the quality of the air.

7pm

8pm

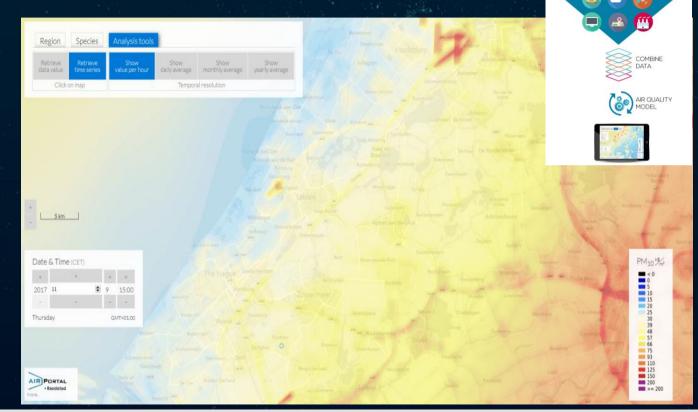


### AIR-Portal – Air Quality Forecasting



space solutions

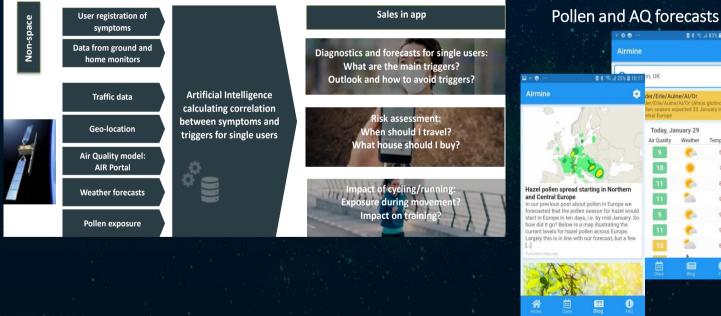
- AIR-Portal provides air quality forecasts to be used in decision making processes by the cities and to inform the public about air quality on a local scale.
- The users involved are the regional governments and cities, general public, 3<sup>rd</sup> parties using the data
- Forecasted air quality information is required to analyse trends, statisctics, assess measures, generate alerts, provision of data to clients.

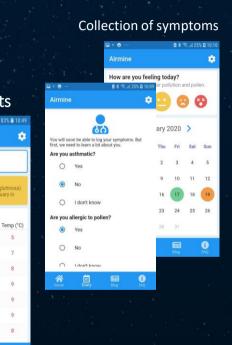


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# Airmine- Mining Air Data for smarter, Healthier Decisions

Airmine consists of a set of analytical services to mitigate the impact of air pollution and pollen on people's health using satellite data and artificial intelligence techniques to develop dose-response functions for the individual users of the services.





Weather

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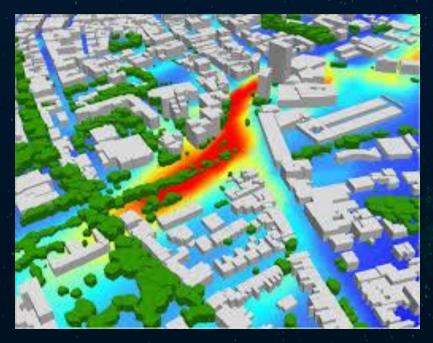


# uTRAQ- Monitoring Air Quality in Traffic Management



SS SIMULATION

uTRAQ brings Air Quality and Weather Monitoring Systems, Modelling and Traffic Forecasting tools and Adaptive Traffic Management Systems into one integrated solution.



- Space application used for management of traffic and air quality
- **Optimises traffic signal timings** for **improved air quality and traffic flow**, instead of just for optimal traffic flow
- uTRAQ is used in the Leicester Traffic Control.
- Commercialization under way in Dubai.
- Discussion ongoing with TFL London.

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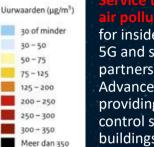
# **Green Buildings - Examples of**



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Services building is environmental responsible, efficient, reducing resource negative impacts on human health and natural environment by: efficiently using energy, water and other resources and reducing waste, pollution and environmental degradation. Space data are essential to monitor air quality for green buildings

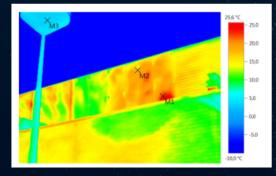




Service to monitor outdoor air pollution (CO2 and N) for inside ventilation, using 5G and space data. In partnership with the Advanced Climate Systems providing measurement and control solutions for utility buildings

### Service to to monitor thermal leaks in

buildings and to identify technical malfunctioning of installations so these can be solved, using 5G and space data.



Service to site selection of new construction, it is essential to analyse the site's natural surroundings (sun, soil, wind, water, and trees) as well as the surrounding built environment (buildings, roads, and local transportation options).

### Space for Cycle Pollution Monitoring and Reduction



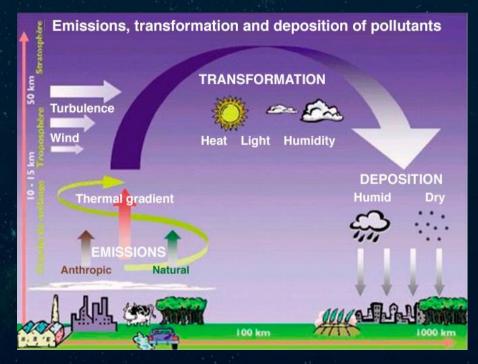
space solutions

Injection of pollutants into the atmosphere, soil water disturb the natural composition of the air, soil and water.

The pollutants entering the water cycle can move throughout the Earth connecting ocean, to land and atmosphere and paving the way to a "pollution cycle".

- Examples of use cases are:
  - monitor and reduce emissions from transport, particularly in urban areas, proposing cleanest modes of transport and recommendations for route map, including services to cut airport-related emissions by introducing new lower emission technologies and practices.
  - helping farmers to reduce emissions by innovating infrastructure and equipment that will reduce emissions, including proposing a land management system to protect habitats impacted by ammonia and adopting low emissions farming techniques.

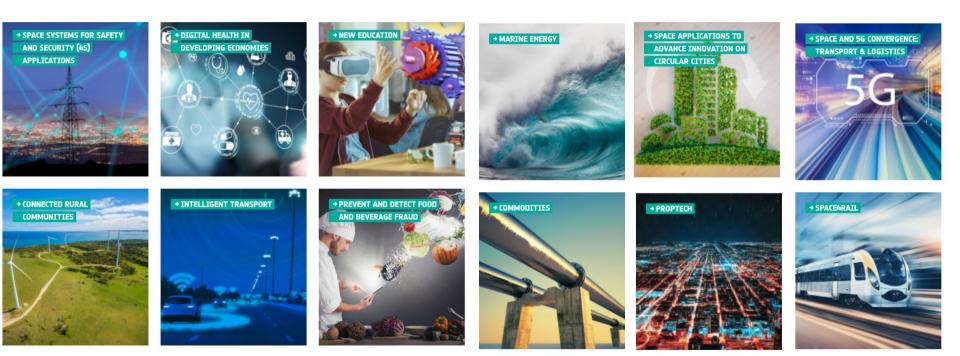
Services to detect water pollution by integrating submersible sensor data and combine this technology with space data and air quality data to transmit contamination alerts in real time with useful implications for water monitoring agencies, government authorities and public.



### Image credit: Encyclopedia of the Environment

# Funding opportunities - Currently open





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roberta.mugellesi.dow@esa.int