

VIAQ-28

November 9th 2023

Map based real-time car service for
reduction of in-cabin pollution

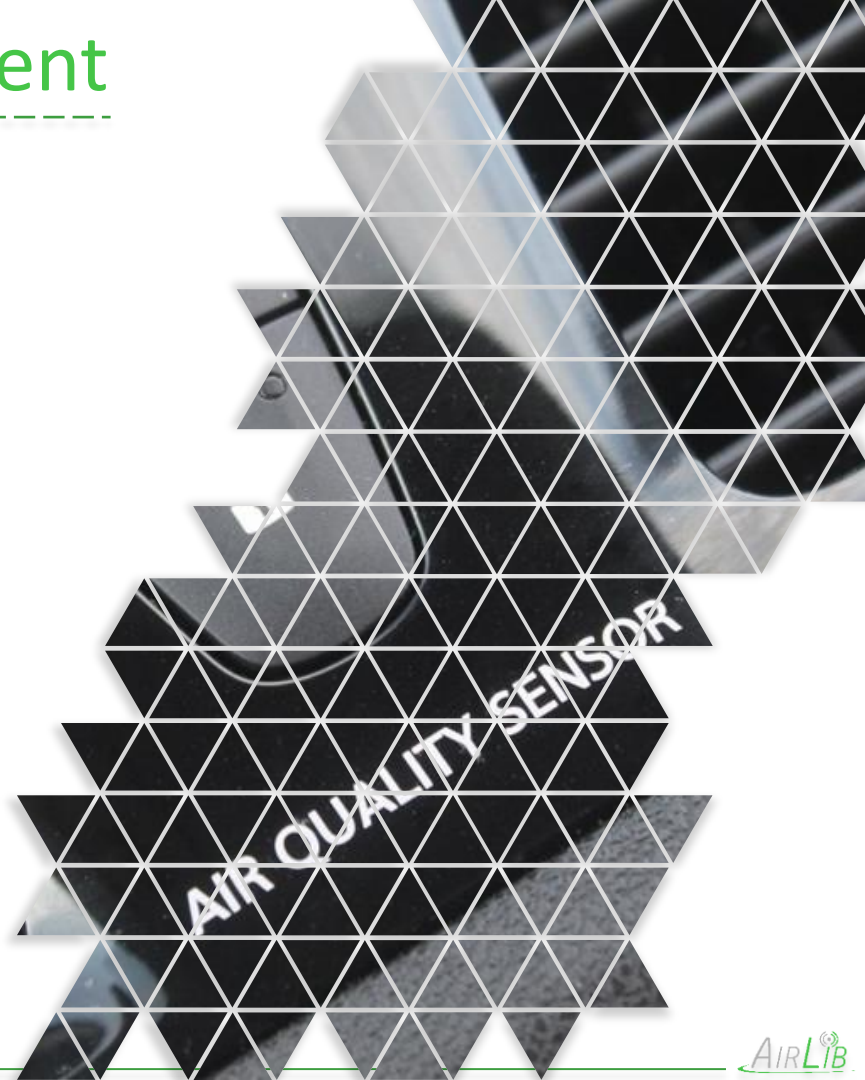
Herve Borrel and Paolo Taddonio, Airlib Inc.

www.airlib.co



In-cabin air quality management

- ✓ OEM have been working on the subject for >30 years
- ✓ First Air Quality Sensor on a BMW 7 series in 1989
- ✓ Now ~ 8 million AQS /year (mostly CO/NO2)
- ✓ Other features: cabin filters, air cleaners, etc...
- ✓ PM is becoming the key pollutant
- ✓ Most OEMs propose new air quality features
- ✓ Hardware cost remains a constraint



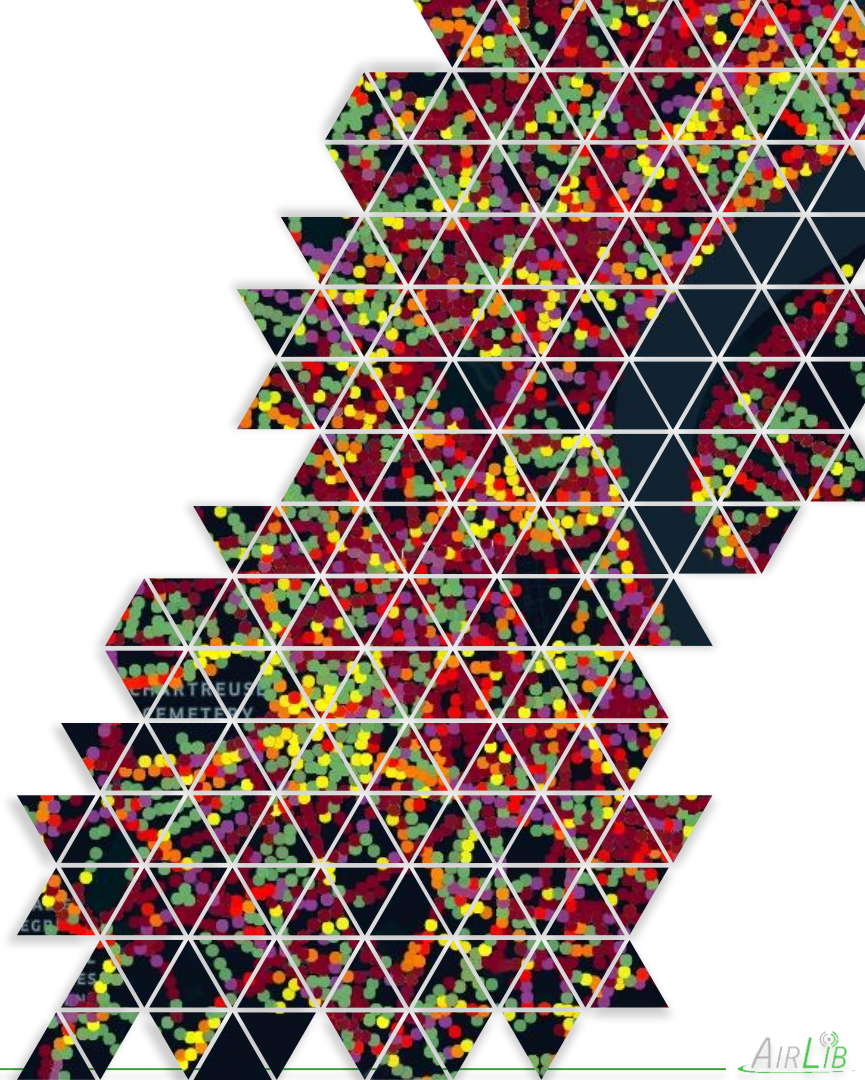
Recent OEM air quality features



... aiming at improving air quality and informing car users

Hyperlocal Air Quality maps

- ✓ Data collected from AQS on-board cars in traffic
- ✓ High spatiotemporal resolution at realistic cost
- ✓ Plan to map the top 50 US and European cities
- ✓ Accessible near real-time on Google Cloud Platform
- ✓ Usable for air intake management

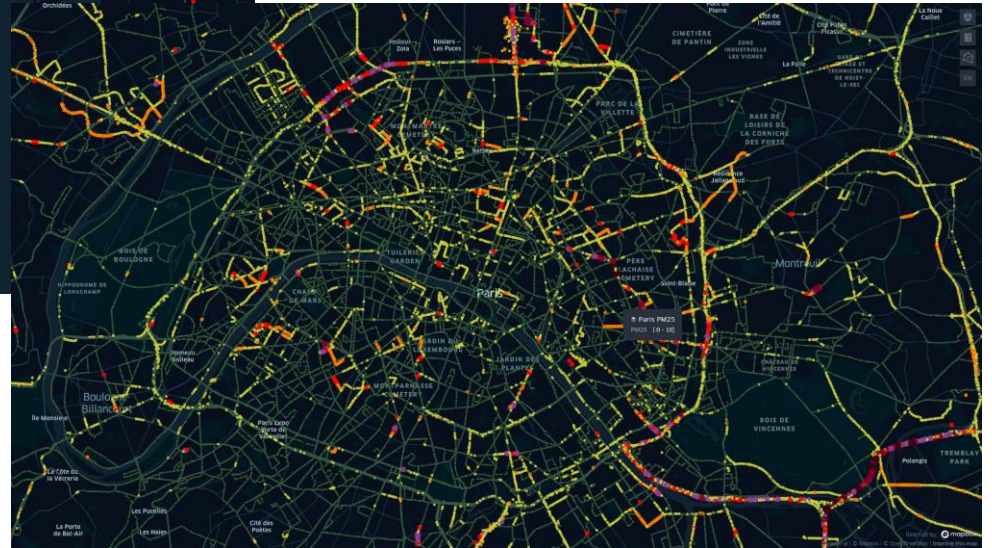
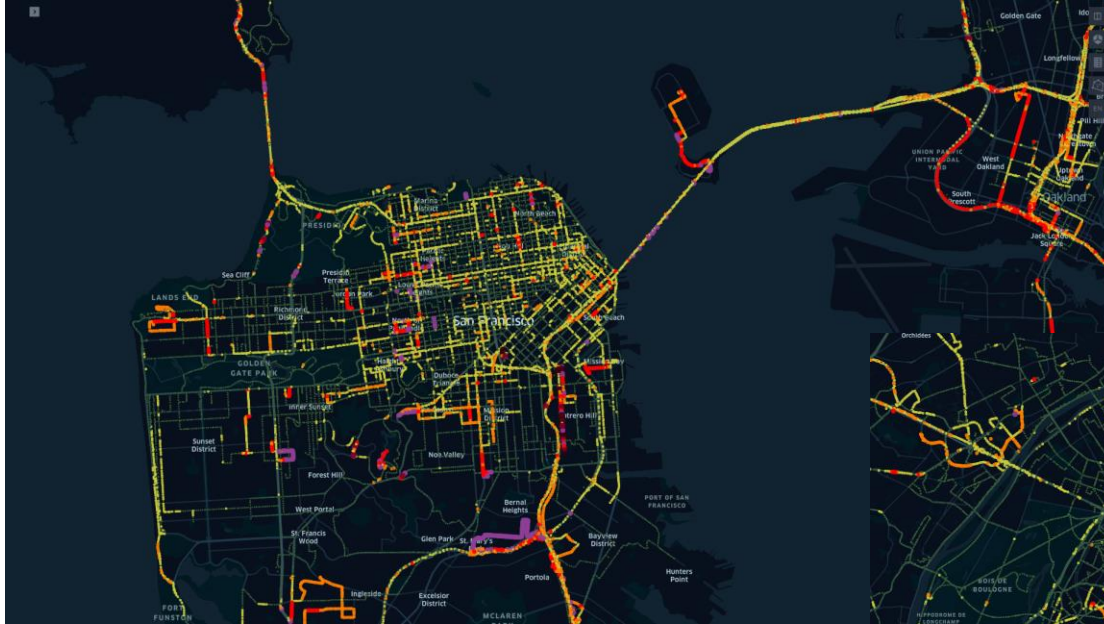


Map info

- ✓ VOCs / NO2 / PM 1, 2.5, 4, 10, RH, Temp from a multitude of ride hailing trips
- ✓ Predictive component: data from last few months
The key assumption is that the past AQIs for a specific location and time of day (and type of day) are a good predictor of the actual AQI due to “repetition of patterns”
- ✓ Real-time component: data collected in the last minute of few minutes
As the data density increases, the real-time component gains increasing weight

San Francisco and Paris maps

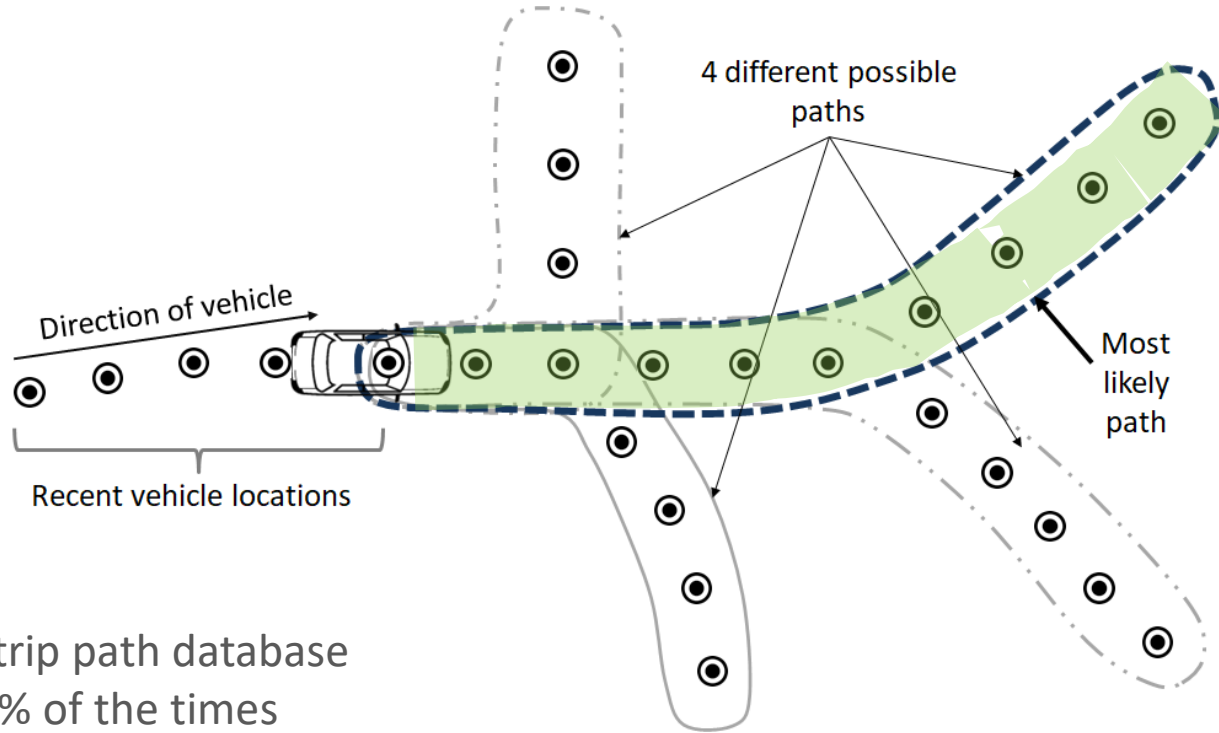
PM 2.5
Pitch ~ 50 meters
Coverage ~ 50 times



Map based pollution exposure reduction



Real-time predictive path

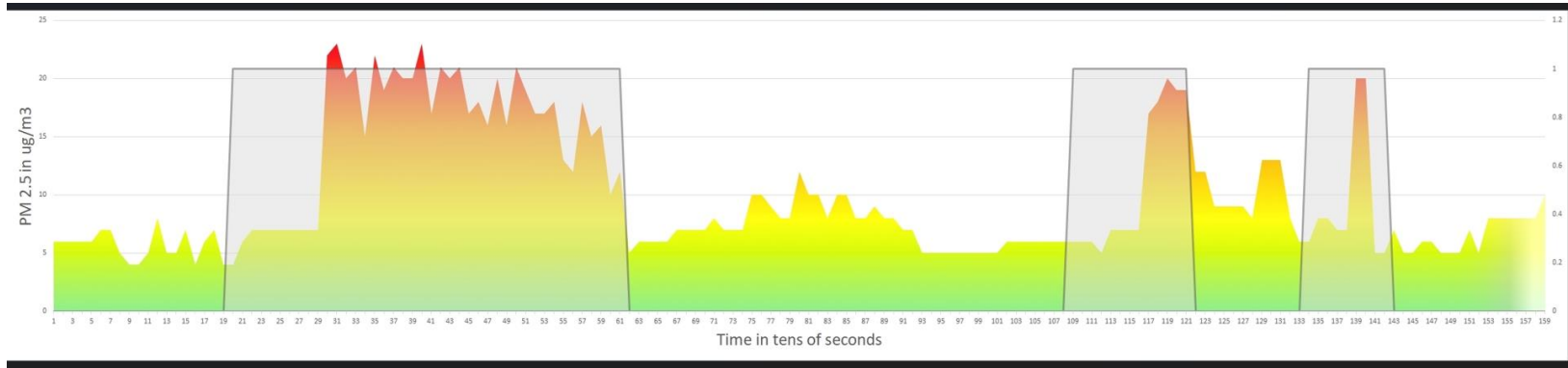


- Based on trip path database
- Right ~ 90% of the times
- Immediate correction otherwise

Car service demo

(to be shown live)

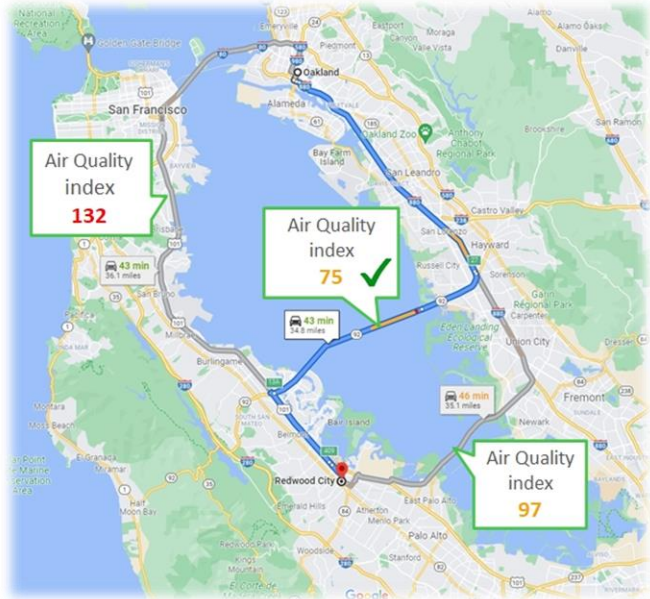
Air quality gains



- Gains can be calculated *
- Better performance than on-board AQS
- Actual on-road gains: measurements underway

* see <https://doi.org/10.4271/2023-01-0139>

Some Airlib user features



Cleaner route information

Air quality map information

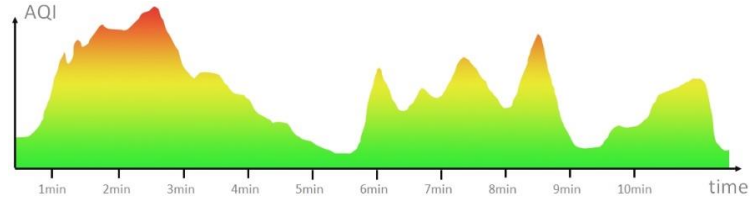


Air quality gains

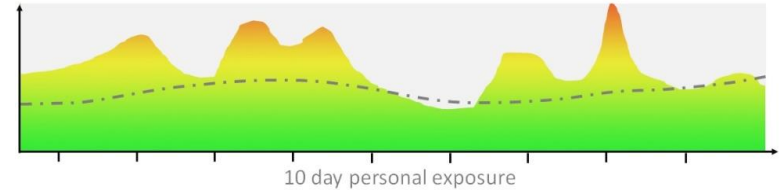


Other user features

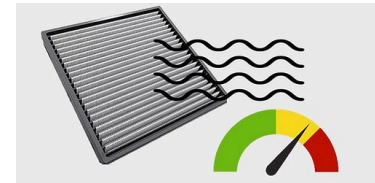
Individual trip exposure



My exposure versus others



Cabin-air filter load gauge and alert



THANK YOU

www.airlib.co

Scottsdale, Arizona

Herve Borrel

herveborrel@airlib.co

