

AVERE WEBINAR: CLEAN AIR AND NOX EMISSIONS FROM VEHICLES

21

APRIL
2021

AVERE
The European Association
for Electromobility

WEBINAR

**Clean air and NOx
emissions from
vehicles**

The end of the ICE Age means cleaner air for everybody



How to address climate change?

- Air pollution is a surrogate for climate change.

When the problem is visible
there has always been
consensus driven solutions.

London 1950's



China 2010's

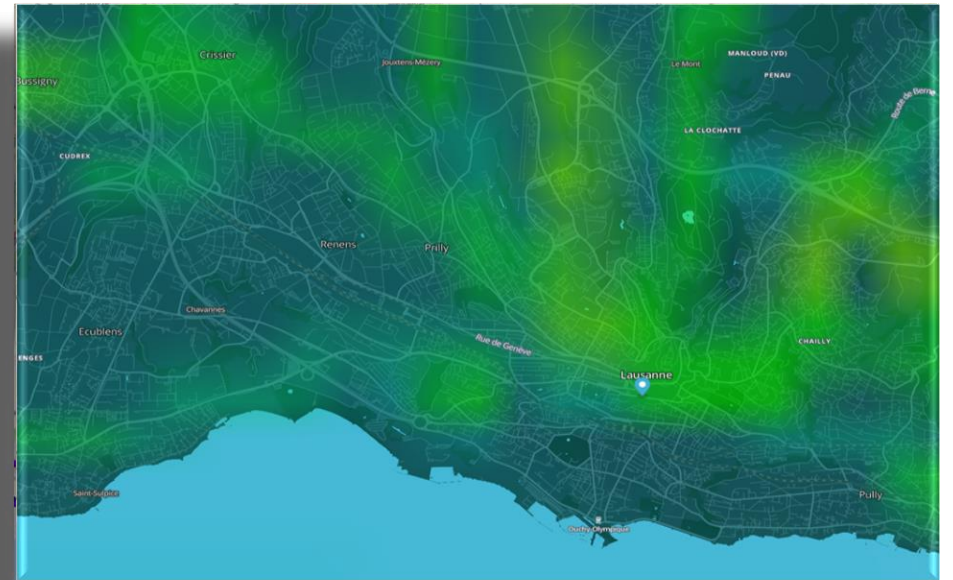


Germany 1980's



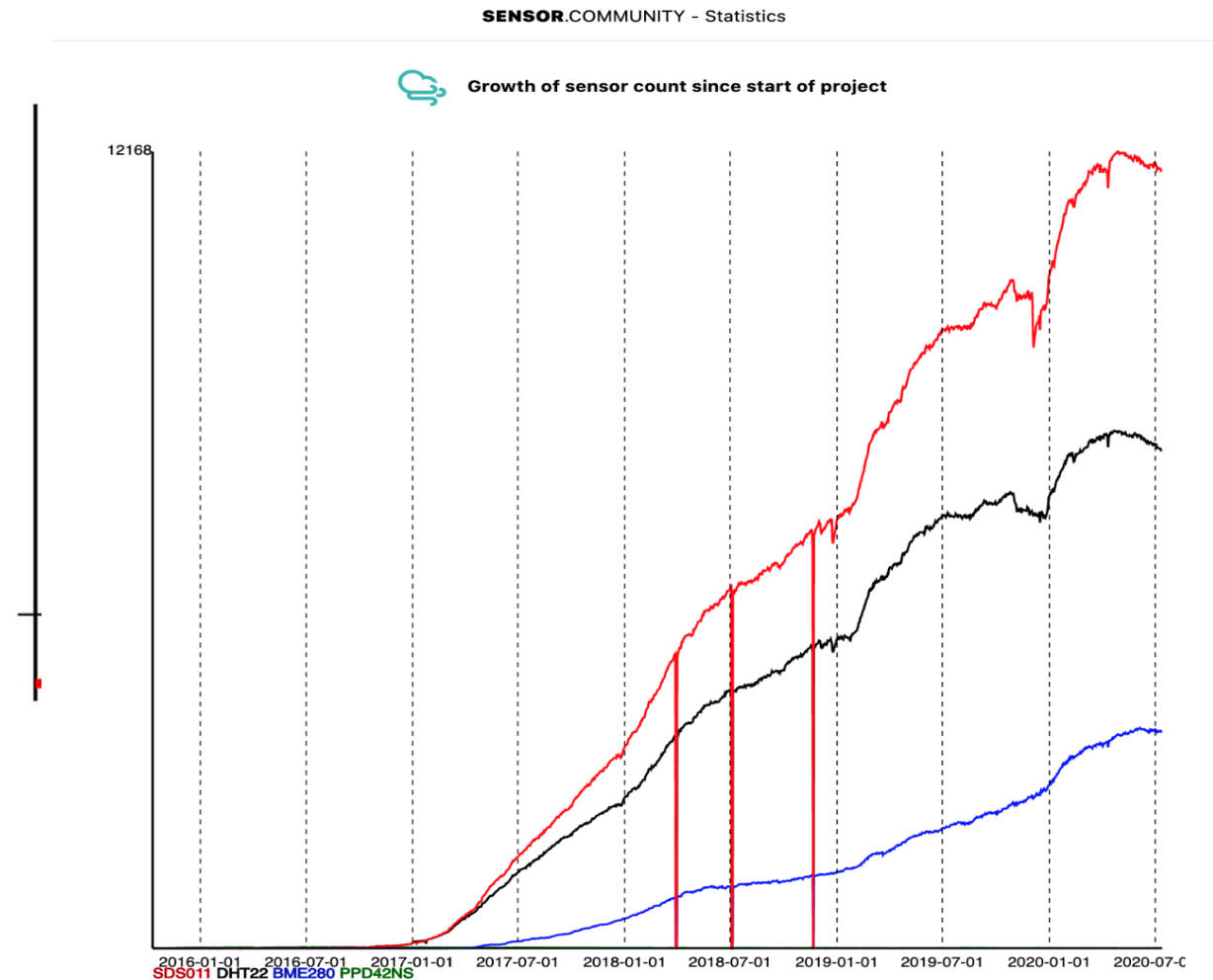
Biggest Issues: Complexity & Collaboration

- Air pollution is complex.
 - Hyper-local, often not visible and highly influenced by weather
- How to get people to collaborate when they can't accurately define the problem?
 - Existing air pollution maps are largely a mirage
 - This not **actionable** information
- Previous approaches have not worked
 - Regulatory limits set in 2005 have not kept pace with science.
 - Deaths in Europe due to traffic accidents ~18k due to air pollution ~400k.



Solution: Simplicity & Enlightened Self-Interest

- Rapid growth of low-cost (LCS) air pollution sensors.
 - municipal IoT enabled LCS market is growing at an astounding **25.4%** per year
 - EU JRC named these devices as potential “**game changers**” for how we deal with air pollution.
- Networking personal air pollution sensors via a mobile network of accurate sensors is the **key** to unlocking this game changing potential.



Solution: Smart Air Quality Network

- How do you make a relatively cheap electromechanical device as accurate as a highly complex set of lab equipment?

Very accurate but expensive



Improving accuracy and inexpensive



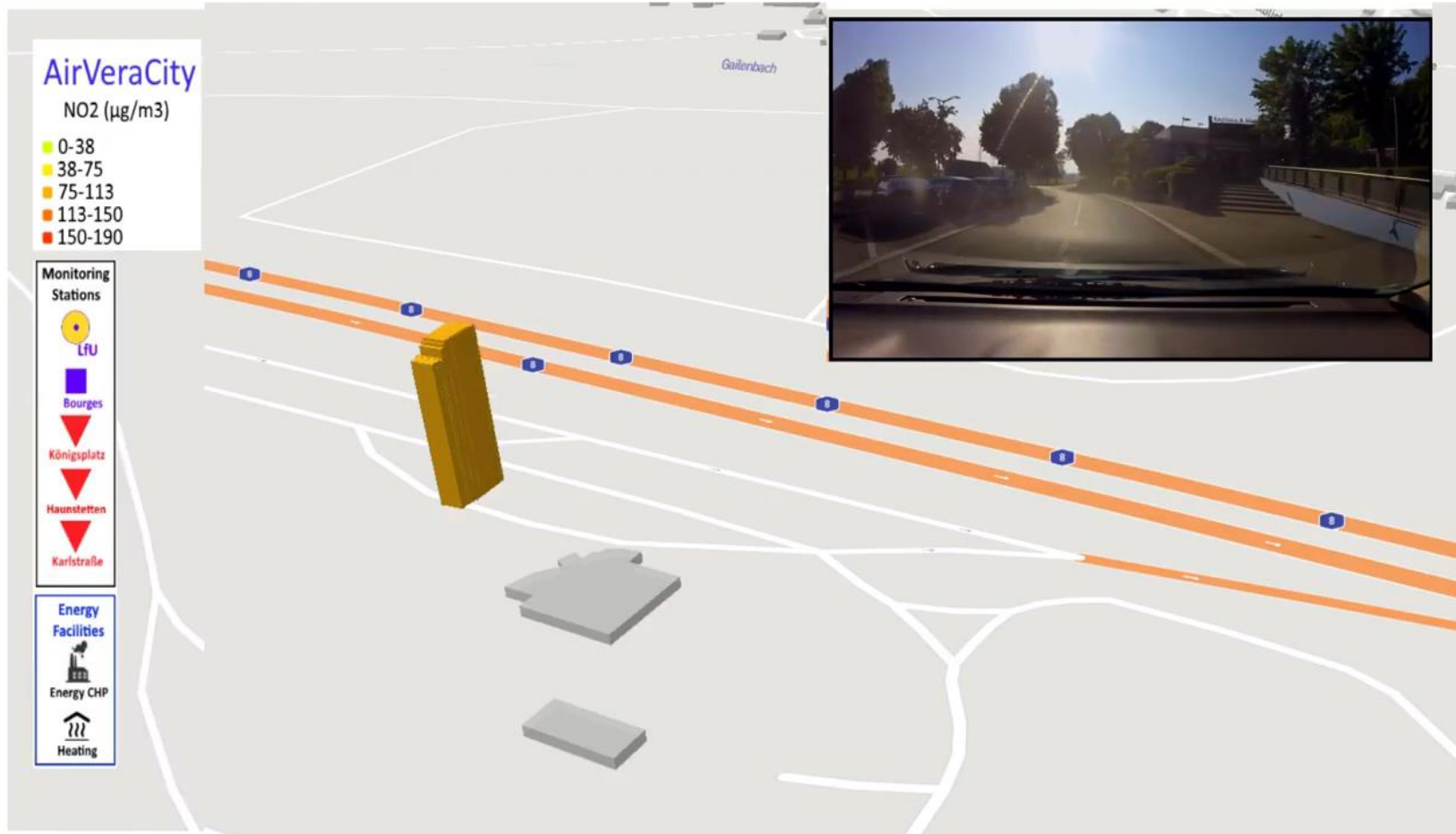
Solution: Smart Air Quality Network

- We achieve this through AI, Machine Learning, advanced signal processing, dynamic daisy chaining calibration and solving for the mobility-caused distortion on slow responding chemical sensors.
- This was achieved over the course of 6 years of nationally funded research across 7 labs in Switzerland including the largest continuous deployment of mobile sensors to normally operated vehicles in the world.

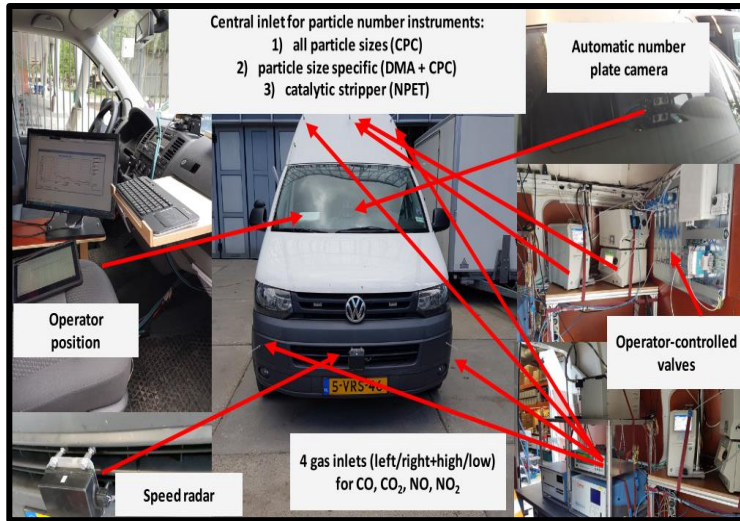


Dieselgate

- Why did it take so long?



Which is more effective?

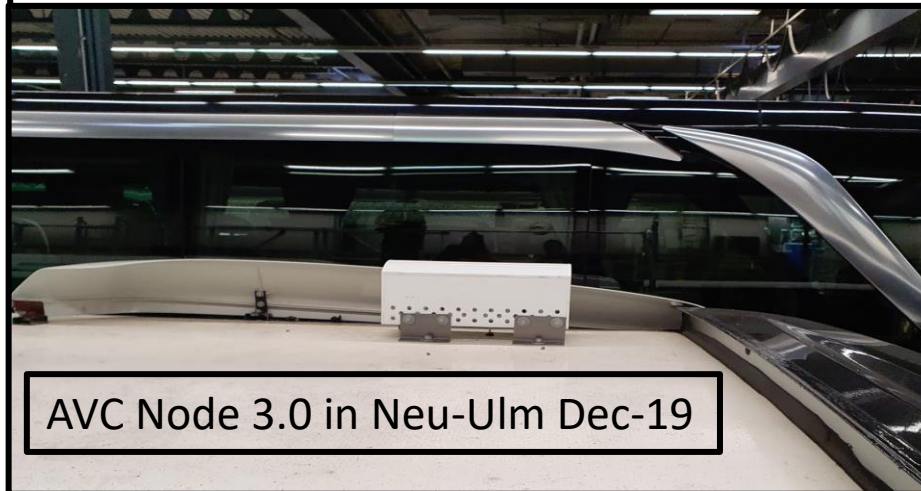


Pollutants Measured: NO₂, CO, O₃, PM_{2.5}, PM₁₀.

Simple and easy installation. The only requirement is a power supply.

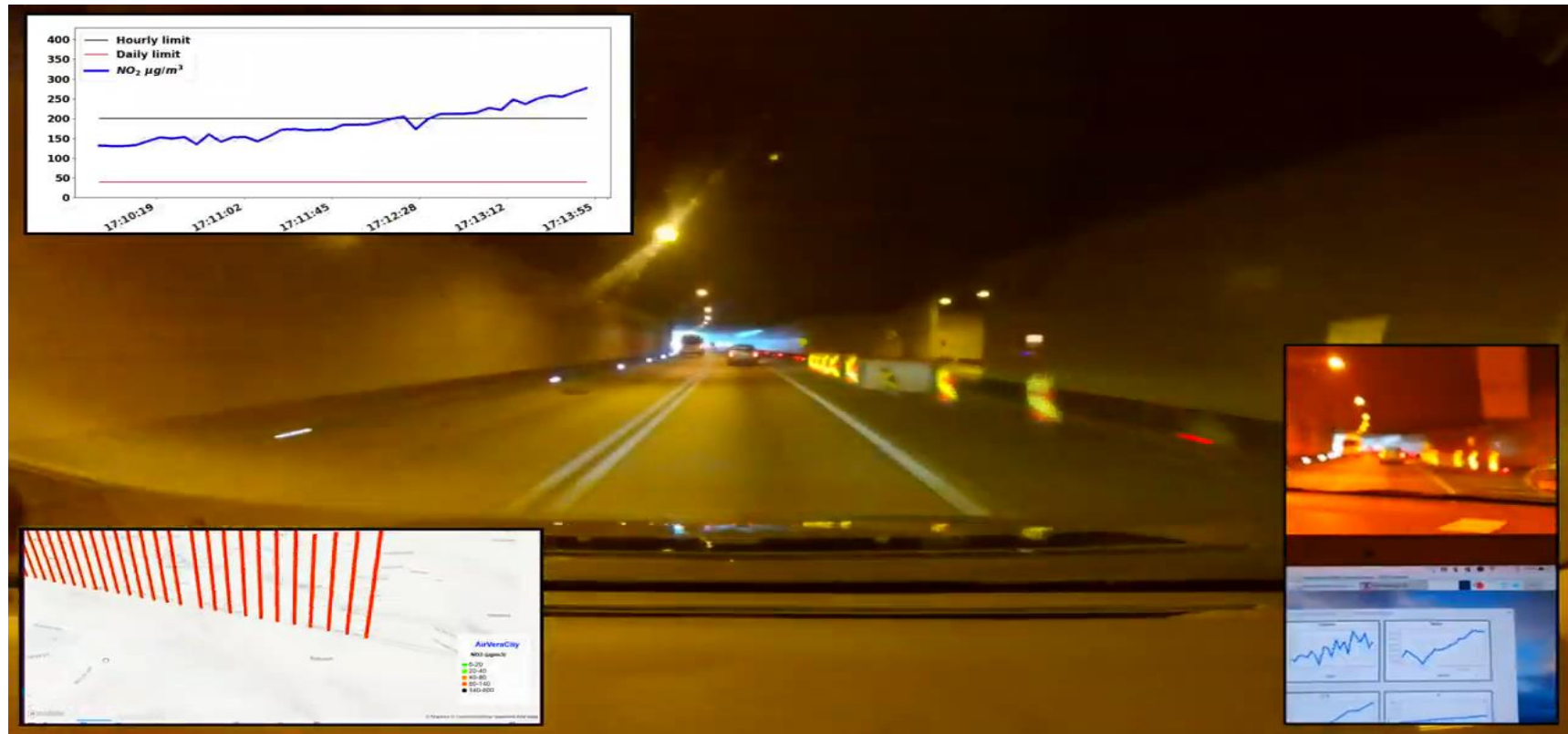
Plug-and-play designed and waterproof to IP66.

Measures air pollution every 4 – 8 seconds.



Some areas are exempt

- Any idea what the pollution level is like in a relatively empty tunnel or parking garage?



Solution: Community Enforcement

- Idling restrictions?



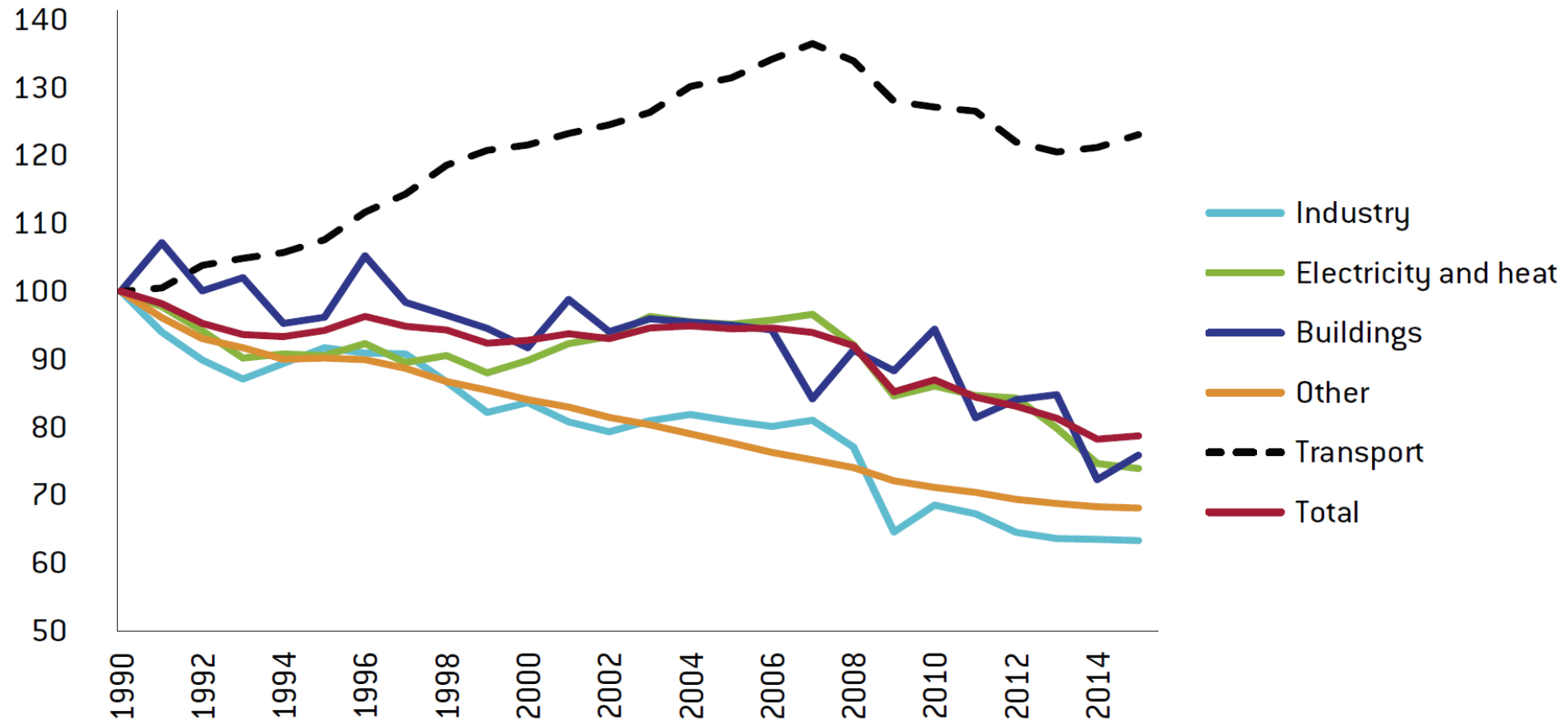
Solution: Visual Displays on Public Transport and Air Purification

- Visual signals can be placed on the exterior and interior of the electric bus to promote bus ridership.
- Exterior LED lights indicate a higher level of pollution as indicated by the color red on the outside the electric bus than exists inside the bus which is in blue.

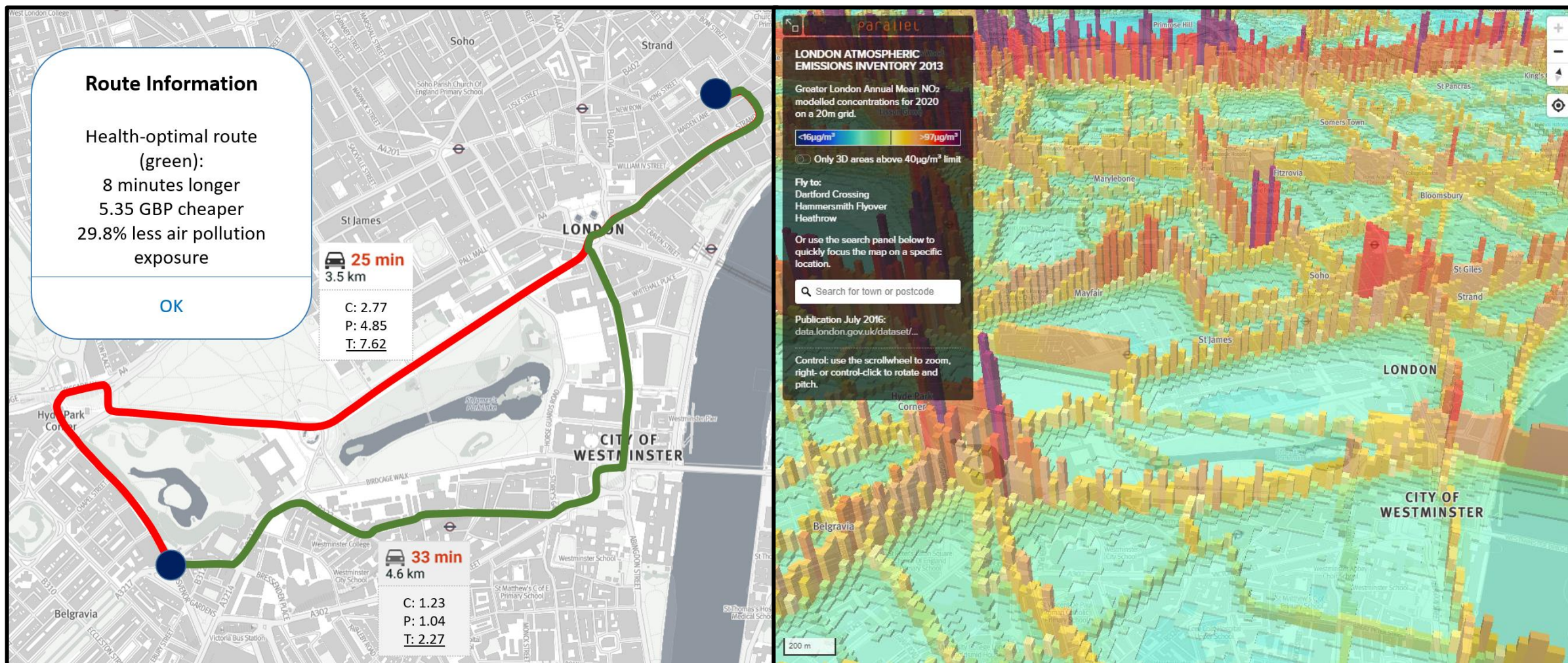


Solution: EU ETS – Transport and Buildings

TRANSPORT: THE ONLY SECTOR IN WHICH EUROPE'S CO2 EMISSIONS ARE ON THE RISE



Solution: Road/Congestion Pricing



Conclusion

- Until we have a critical mass of informed citizens in our society we will get away with gestures. – Paul Collier, Economist
- “Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.” – Margaret Mead, cultural anthropologist



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