



**COST**

**Example of applications of sensors for urban air quality  
in the Netherlands**

**- *EuNetAir***

**COST Action TD1105**

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**Function in the Action: WG3 and SIG2 member**

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# Example of a future sensor network in the Netherlands

- **Location:** City of Eindhoven

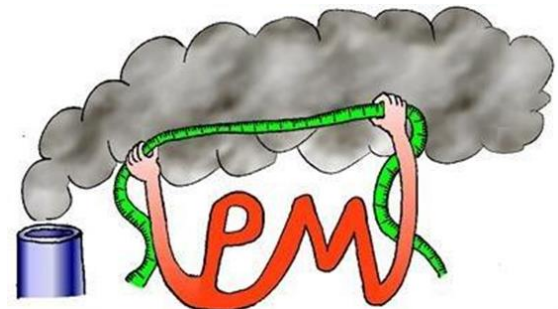


- **Challenge:** to execute AQ measurements with more devices against less costs but with sufficient accuracy >> deploying sensor systems

## Example of a small sensor network in the Netherlands

### **A****AREAS** aims at:

- Protecting health of the population
- Improving communication with the public about AQ and health effects
- Better justification of (unpopular) traffic measures
- Acquiring a data set that might be useful for health research and traffic flow regulation
- Solving and preventing AQ “hot-spots”



# Example of a small sensor network in the Netherlands

<http://www.geogids.info/thema/luchtkwaliteit/default2.asp>



## Sensor network design:

- 30 sites + 5 mobile units in Eindhoven area
- NO<sub>2</sub> (30x) (electrochemical)
- PM<sub>10</sub> + PM<sub>2.5</sub> (optical)
- O<sub>3</sub> ...
- UFP (5x): Areasense Nanotracer (Philips)
- Waspote/GPRS Module interfacing sensor unit with the database

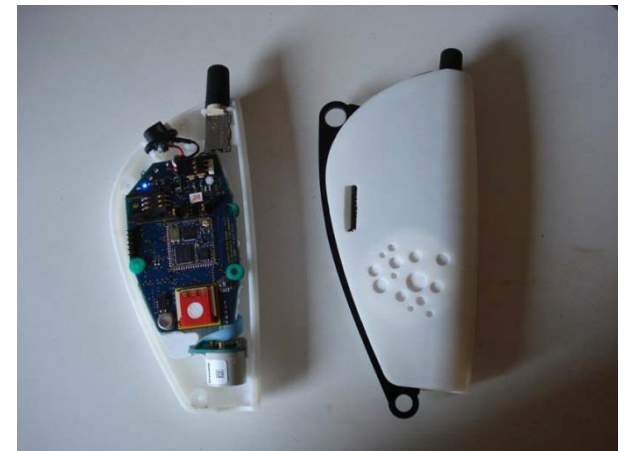
## Example of a small sensor network in the Netherlands



- **Nitrogen Dioxide Sensoric NO2 3E 50 (City technology)**
- Tested by EPA (2010): “highly correlated with reference NO2 levels and little O3 cross-sensitivity.”

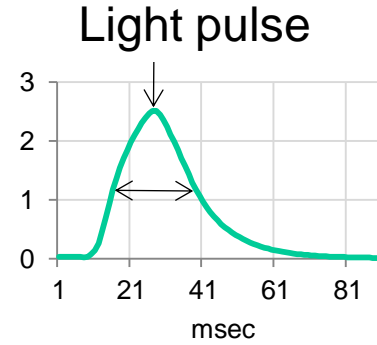
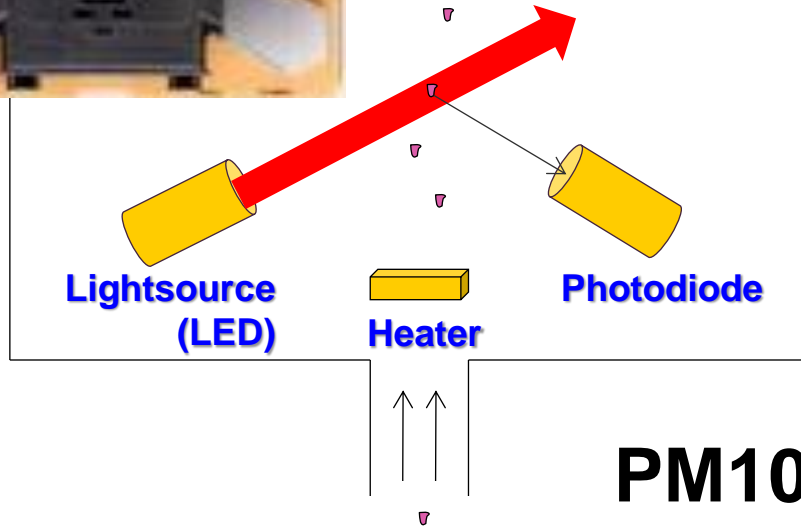
[Characterization of Low-Cost NO2 Sensors,  
Draft Final Report STI-910112-3958-DFR,  
prepared by Sonoma for EPA]

- Now testing in Amsterdam AQ site



# Particle sensor

(SHINYEI Technology, Japan)



## PM10 and PM2.5

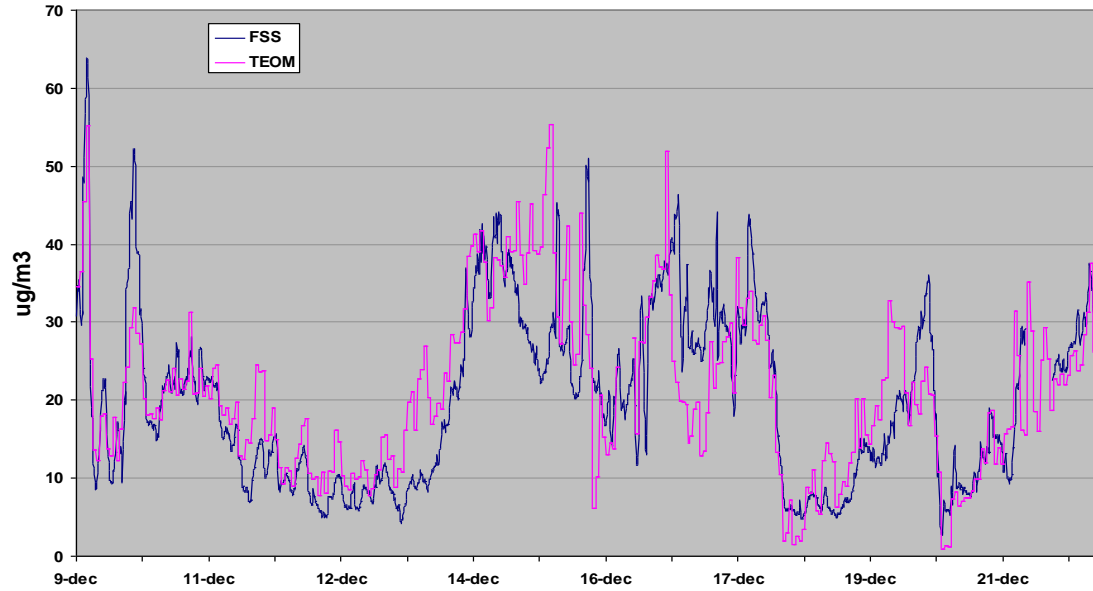
ultralow cost  
dry conditions





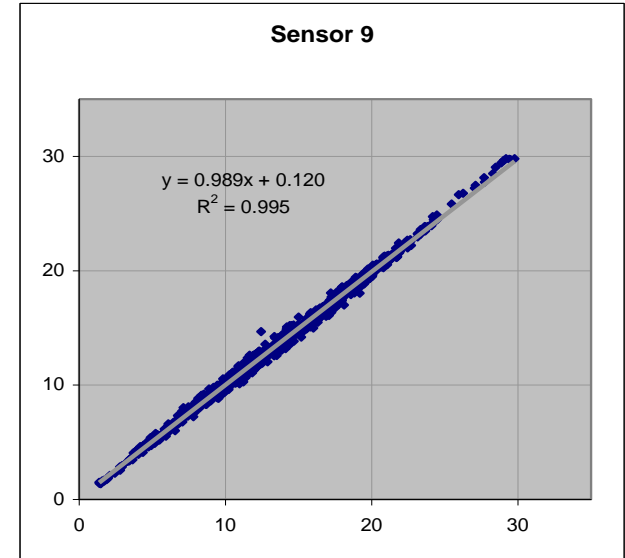
# Some results

### FSS vs TEOM

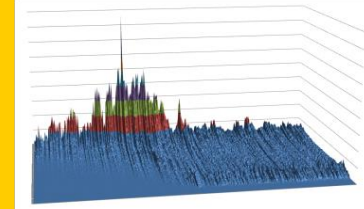
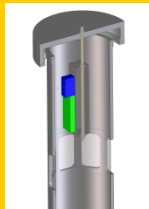


### comparison

### Sensor 9



### precision



# Example of a small sensor network in the Netherlands



- Aerasense Nanotracer (Philips)
  - particle number and average diameter
  - 10-300 nm size range
  - Now: comparison with SMPS



FIGURE 3 The Aerasense NanoTracer.

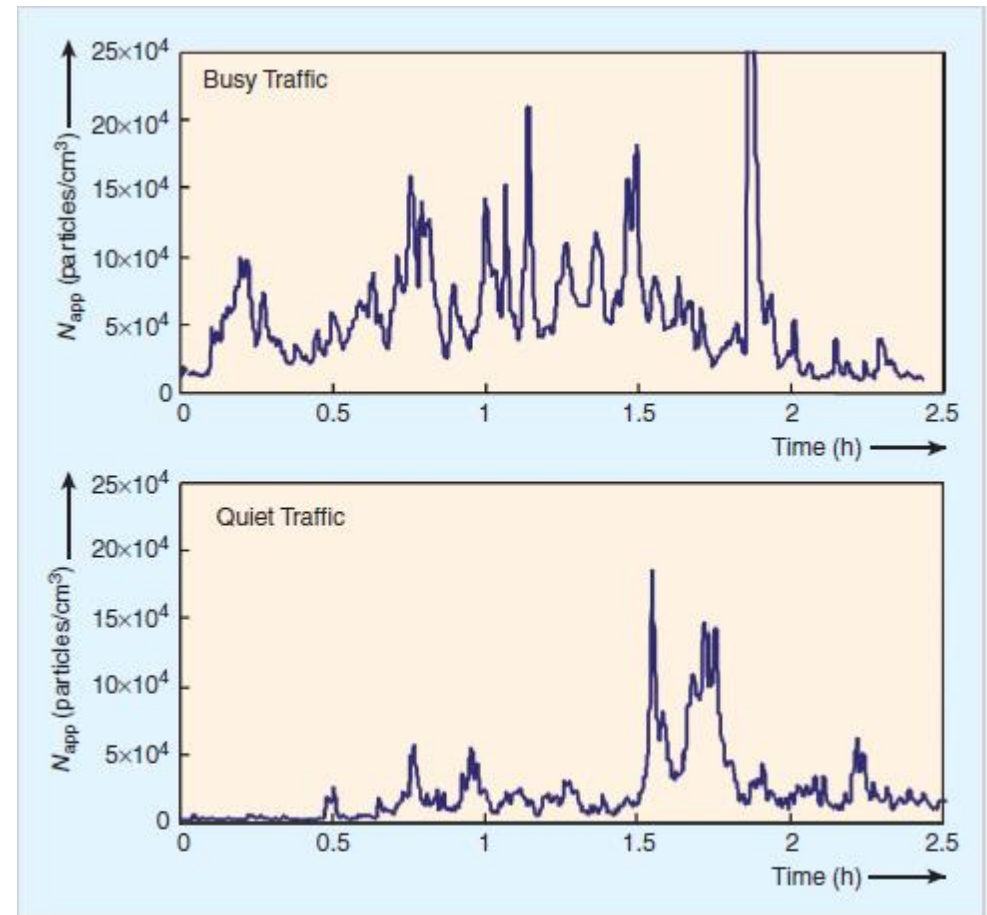


FIGURE 8 Measurements of  $N_{app}$  in a car cabin during driving under both busy and quiet traffic conditions.