REMOTE SENSING OF EMISSIONS

1. CONTEXT

The improvement of the air quality for all citizens, especially in the cities, is one of the main targets for all the stakeholders involved in the mobility and transport development. From April 2016, a major improvement has been introduced: the Real Driving Emissions (RDE) regulation, to control and validate the emission performance of the vehicles not only in specified driving conditions in laboratories but in real driving conditions.

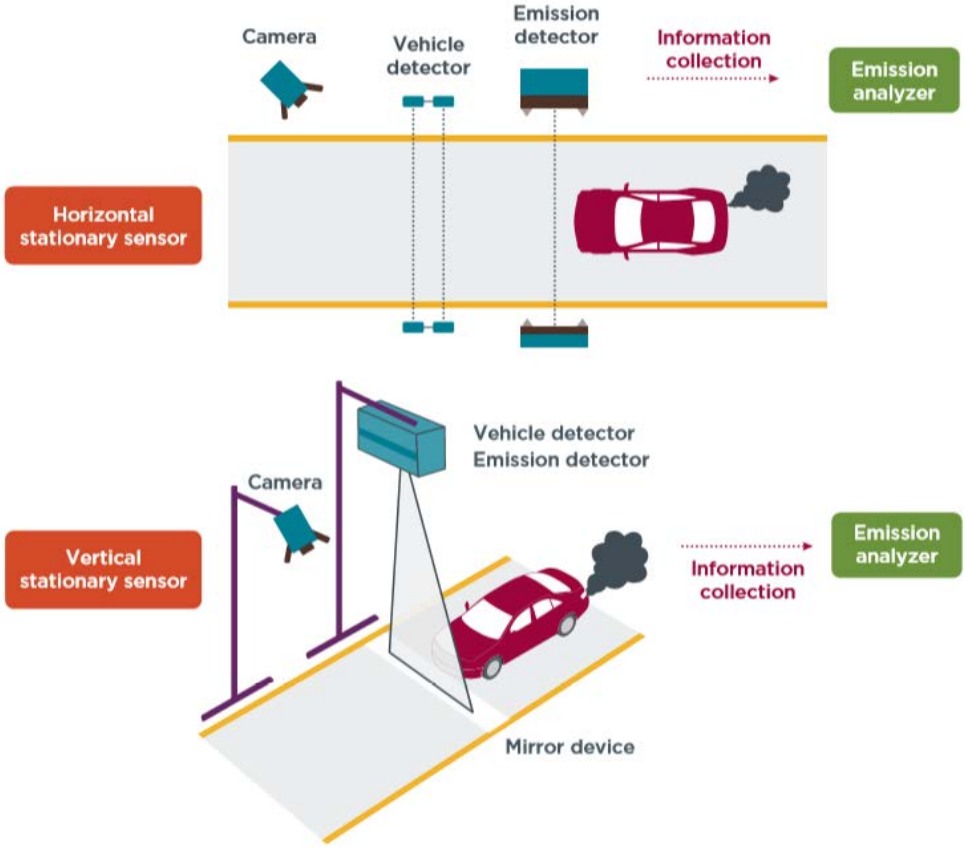
2. RDE TEST

The RDE tests are performed with a Portable Emission Measurement System (PEMS) on roads and cover a large range of driving speeds: city, rural and motorway. In addition to the tests performed in laboratories in reproducible conditions, the RDE tests allow to cover a wide range of conditions (altitude, temperature, acceleration …) and/or driving behavior. The RDE tests are not reproducible because each test is a snapshot of special conditions. The PEMS is an equipment able to measure NOx, CO and PN with an accuracy acceptable compared to the lab equipment (margin below 50%).

Nevertheless, the preparation (installation of the PEMS…), the test-drive (between 1.5 and 2 hours per test) and the data analysis take a long time (globally a few days) and are expensive. Consequently, only a low total number of vehicles is tested with a PEMS.

3. REMOTE SENSING

Remote sensors are devices positioned at the roadside and able to measure in real time the emissions (gaseous and particles) of vehicles in the traffic. By their concept, they can measure the emissions of many vehicles in a specific place. In parallel, by scanning the registration plate of the vehicle, it is possible to make the link to the homologated whole vehicle type (TVV Type Variant Version). The precision of the measurement is not as good as analyzers in Chassis Dyno or PEMS and is significantly dependent on climatic conditions. Because they measure only in one specific condition of traffic, they must be placed in several points to be representative of several driving conditions).



The technology and its accuracy need still to be demonstrated for the different measured pollutants. The emission level will have to be expressed in concentration (ppm or %) and not in mg/km like PEMS or Chassis dyno.

PFA proposal

Remote sensing devices could be very useful to quickly screen many vehicles, make statistics and alert authorities. For scientific reasons they cannot be used as an absolute measuring device for a pass/fail test with specific emission limits. As their measuring points give information which is only locally valid and does not cover bigger areas, it is not recommended to base city policies regarding traffic restriction on these local results

They should be used to identify which vehicles or homologated whole vehicle types seem to emit significantly more pollutants than the others of the same emission level (Euro X step). This data may trigger additional tests of these vehicles, with the regulatory test method to control their real level of emissions.based on statistical plan like ACEA proposal .