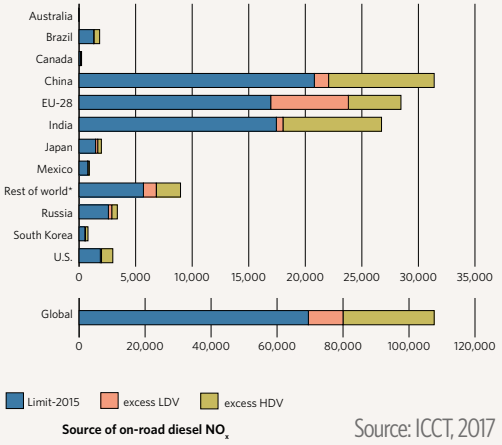
true

THE REAL URBAN
EMISSIONS INITIATIVE

THE CONTEXT

The Dieselgate scandal highlighted the gap between real-world and lab-tested vehicle emissions, and the negative impact of rising air pollution on public health and mortality rates which is significant. Diesel vehicles in major markets produce over 50% more nitrogen oxide (NO_x) than official certification limits indicate, according to a recent study, published in Nature[1]. These excess NO_x emissions have been linked to as many as 38,000 premature deaths worldwide in 2015—mostly in the European Union, China, and India.

FIGURE 1: GEOGRAPHIC SOURCE OF ON-ROAD DIESEL NO_x



Source: ICCT, 2017

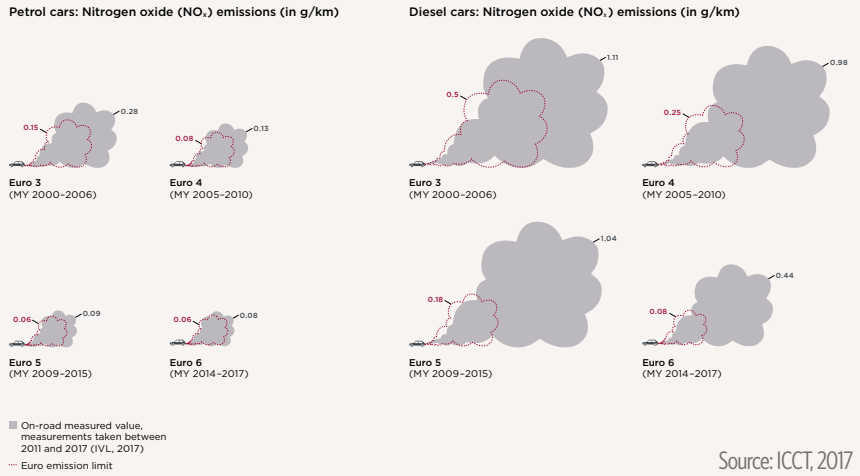
The health of residents of urban areas, where vehicle traffic is most concentrated, is disproportionately impacted. Premature deaths and other adverse health impacts as a result of transportation-related air pollution include heart disease, pulmonary disease, and lung cancer.[2]

For too long the vehicle emissions data on which regulations and policy are based has been inaccurate. In many cases, the real-world emissions of vehicles massively exceed the tested values at which they were certified for sale (Figure 1). Real-world testing of vehicles as they are driven on our roads is essential to address this data deficit. Better data should lead to better policy, better consumer choices and better air quality. Capturing and sharing real-world emissions data is the key tenet of the TRUE Initiative mission for cleaner cities worldwide.

While national governments are typically responsible for setting and enforcing motor vehicle emission and fuel economy standards, pressure is building on city governments to do more to ensure clean air for their residents. City governments are directly impacted, financially and otherwise, by poor urban air quality. Increasingly waiting for action from national governments, mayors of major cities are taking action to fight air pollution from vehicles. Paris and Mexico City have announced plans to ban the entry of diesel vehicles by 2025, for example, and London has established a fee scheme to charge to older vehicles when entering the city centre.

However, differentiating vehicle access based solely on the fuel type or registration year is a blunt instrument which risks penalizing better-performing vehicles or overlooking high-emitters. The key to the best possible policy is the availability of the best possible data. As Figure 2 shows, real-world testing can be very useful in exposing the difference between real and tested emissions levels.

FIGURE 2: REAL-WORLD VS OFFICIAL NO_x EMISSIONS FROM EU CARS



Source: ICCT, 2017

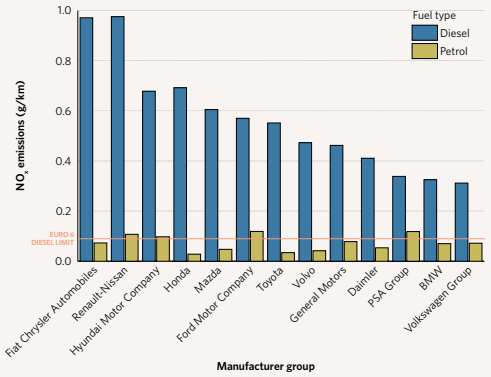
[1] Impacts and mitigation of excess diesel NO_x emissions in 11 major vehicle markets. Authors: Susan Anenberg, Joshua Miller, Ray Minjares, Li Du, Daven Henze, Forrest Lacey, Chris Malley, Lisa Emberson, Vicente Franco, Zbigniew Klimont, and Chris Heyes, *Nature*, 25 May 2017, **doi:10.1038/nature22086**

[2] **https://horizon-magazine.eu/article/ultrafine-pollution-particles-create-air-menace_en.html**

CAUSES OF HIGH EMISSIONS

All large manufacturers in Europe have produced vehicles with higher real-world diesel emissions values than the set limits in recent tests (Figure 3).

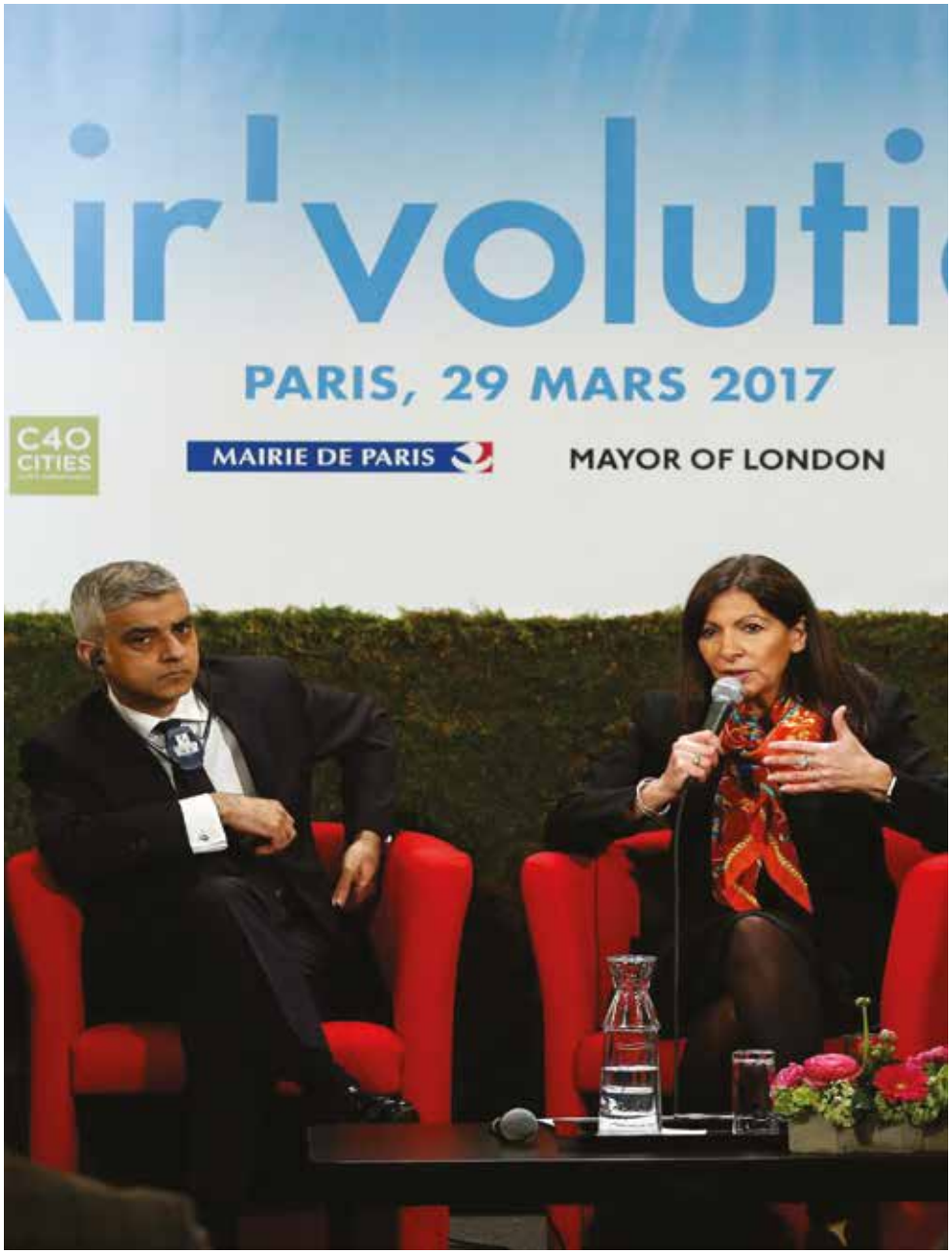
FIGURE 3: NO_x EMISSIONS BY VEHICLE MANUFACTURER



Source: ICCT, 2017

High vehicle emissions can be attributed to a fault of either the manufacturer or the actions of the owner. Systemically high emissions from all vehicles of a particular make or model may be caused by defective parts, deterioration, or deliberate cheating by a manufacturer, as evidenced by the Dieselgate scandal. Individual vehicle owners can be responsible for high emissions, either by neglecting vehicle maintenance or deliberately tampering with emission control system components.

Some discrepancy between laboratory test results and on-road performance is unavoidable because laboratory conditions can never replicate actual driving conditions. Too great a gap between these results, however, signals the presence of a systemic problem, with serious implications for public health in areas with high concentrations of high-emission vehicles.



ABOUT THE TRUE INITIATIVE

The Real Urban Emissions (TRUE) Initiative is a partnership of FIA Foundation and the International Council on Clean Transportation (ICCT) TRUE is currently funded by FIA Foundation, Bloomberg Philanthropies, and the Joshua and Anita Bekenstein Charitable Fund, and further funding sources are actively being explored.

TRUE's advisory board, which includes C40 Cities, the Global New Car Assessment Programme (Global NCAP) and Transport and Environment (T&E), will help to determine high-level strategy and provide institutional guidance. A technical committee provides expert scientific advice and review. We also work with corporate partners that provide paid emissions testing services and data.

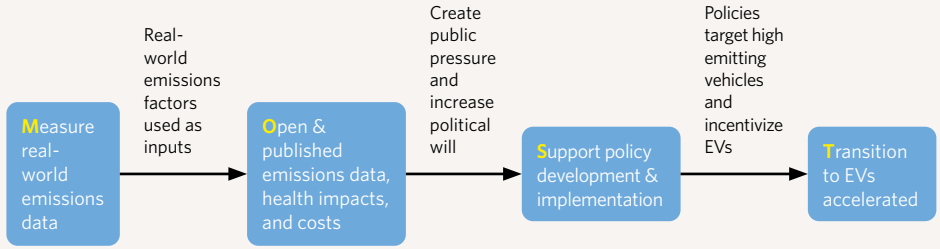
TRUE has hosted a number of forums to connect cities and technical specialists from around the world to discuss and share experiences of remote sensing data to inform city policies, such as low emission zones.

TRUE GOAL

TRUE's goal is to improve urban air quality and reduce the negative health impacts of pollution by closing the gap between real-world and regulated vehicle emissions in cities across the globe. TRUE will create a global network of research institutions, civil society, and - primarily city - governments dedicated to using real-world emissions data to support low-emission transportation policies and actions as part of the move towards zero tailpipe emissions transportation solutions.

The programmatic work of TRUE is driven by the MOST model of change (Figure 4) which identifies measurement, open data, support and transition as the drivers of action towards healthier urban air. Real-world emissions data can be used in a number of ways: as inputs for health impact studies; as supportive data for consumer choices; or published directly to show the extent of real-world vehicle emissions in a given city. TRUE will then support the development of policy to target high-emitting vehicles, such as measures that restrict certain vehicles from cities boundaries, as well as incentivizing electric vehicle uptake (EVs).

FIGURE 4: MOST MODEL - THEORY OF CHANGE



TRUE OBJECTIVES:

- Be the source of transparent and accurate data for real-world emissions of vehicles in urban areas
- Inform and engage with policy-makers, consumers, and other stakeholders
- Influence manufacturers to clean up their act in relation to real-world vehicle emissions

TRUE ACTIVITIES:

- Establish and develop a methodology for measuring and rating real-world emissions of cities' vehicle fleets as well as categorizing the causes
- Collect and publish data on real-world vehicle emissions
- Publish evaluation and analysis of policy measures to curb urban emissions
- Grow the TRUE network to include more cities and stakeholders
- Host forums to share work and build consensus

TRUE CITIES

In March 2017, the Mayors of Paris and London announced plans to be TRUE pilot projects and to measure and make public real-world emissions levels from vehicles in their cities. Testing has now been carried out in both cities, and the TRUE database reflects the results of that testing and is now based on over 1 million vehicle observations.

TRUE data provides cities with a clearer understanding of the levels and causes of high emissions, information on vehicle fleet characteristics, and insights into effective emission curbing measures such as vehicle bans, fee-charging schemes, low emissions zones, or incentive programs.

In both cities diesel vehicles have been shown to be over-emitting on tested values, and specific groups – black cabs in London and two-wheelers in Paris - have been shown to pose a particularly city-specific problem. In London, Mayor Sadiq Khan enhanced his policy to accelerate the clean-up of black cabs in response to the conclusions of the TRUE data.

The TRUE project will be rolled out with participating cities across the globe. Beyond individual city measures, the results will inform wider policy development for cities, countries and regions. TRUE will work with cities who seek support for cleaner vehicle initiatives.

HOW ARE REAL-WORLD EMISSIONS TESTED?

TRUE aims to collect emissions data on as many vehicles as possible in the cities in which we work.

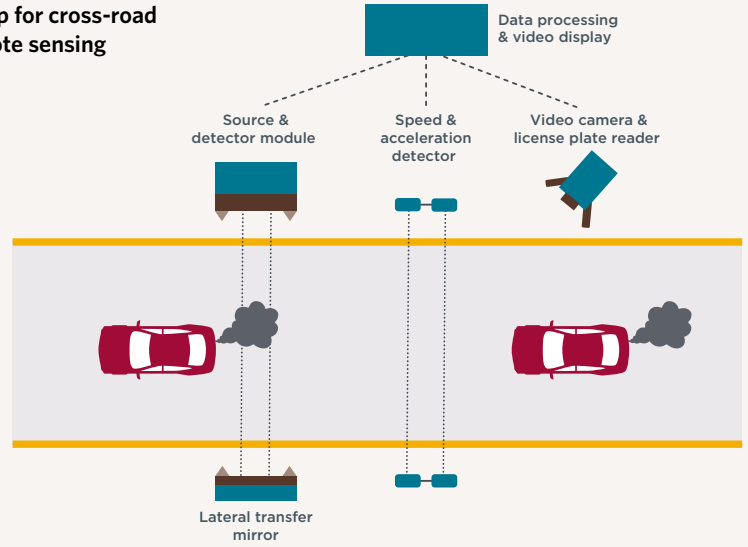
A number of different real-world emissions measurement methods exist today, including Portable Emissions Measurement System (PEMS) and remote sensing. Each of these methods has its own unique strengths, however, neither can provide us with all the information we need to know about real-world emissions. In the absence of such a 'silver bullet' emissions measurement method, the TRUE initiative aims to focus on understanding how existing methods can be efficiently applied to help us answer pressing questions about real-world vehicle emissions.

REMOTE SENSING is a non-intrusive technique that captures a snapshot of emissions data as a vehicle drives by. Once enough data points are collected the remote sensing technique is accurate enough to determine the average real-world emissions over a wide range of conditions for a particular vehicle model or family.

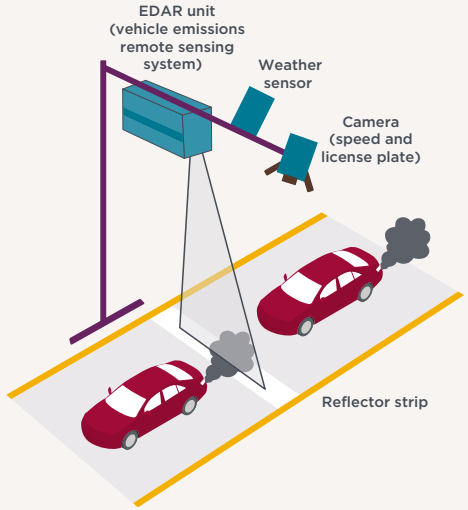
PORTABLE EMISSIONS MEASUREMENT SYSTEM (PEMS) TESTING measures the second-by-second emissions of a vehicle as it is being driven on the road or track. The data that comes from a single PEMS test of a given vehicle is very detailed - typically consisting of hours worth of data. This makes PEMS an ideal technique for understanding the precise conditions that lead to high emissions.

FIGURE 5: SCHEMATIC SETUP OF TWO DIFFERENT TYPES OF REMOTE SENSING SYSTEMS

Setup for cross-road remote sensing



Setup for top-down remote sensing

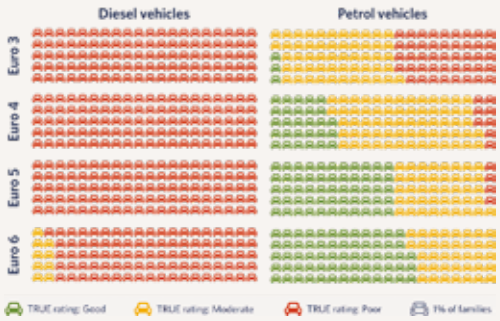


Source: ICCT, 2017

WHAT IS THE TRUE RATING?

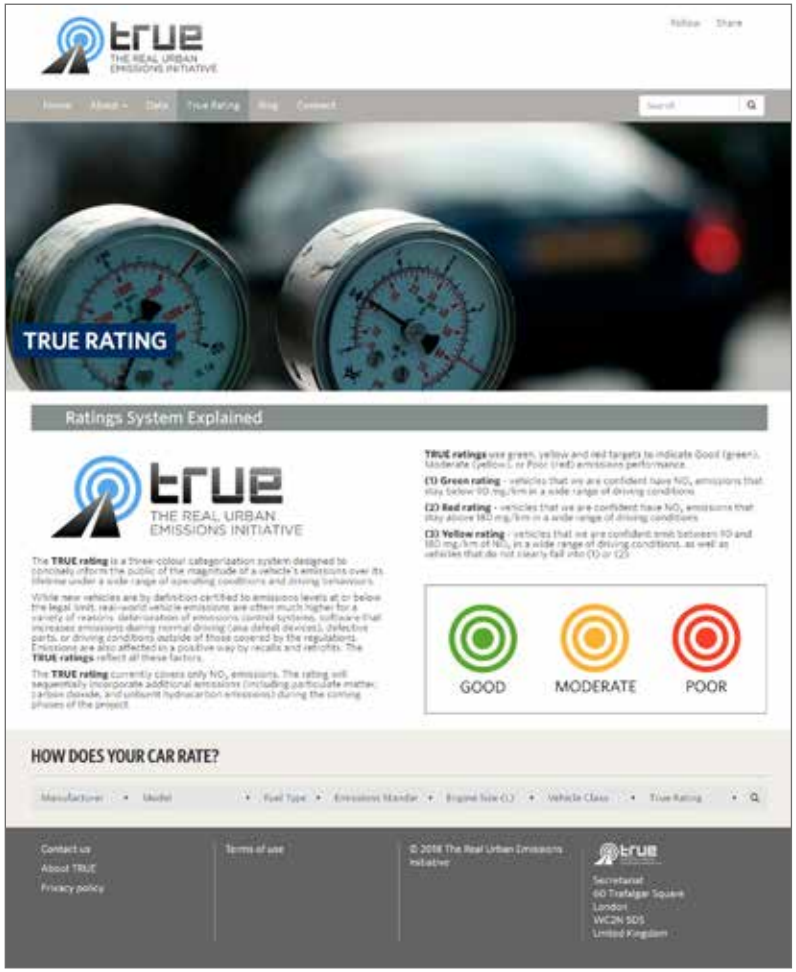
The TRUE rating is a three-color rating system to inform the public about individual vehicle emissions. The rating covers a car's full lifespan under a wide range of operating conditions and driving behaviours. Emissions are tracked over the lifetime of the vehicle primarily through the use of remote sensing technology which is able to collect emissions snapshots of thousands of vehicles per day. The TRUE ratings rank all vehicles using the same methodology regardless of fuel type or Euro Standard.

FIGURE 6: PASSENGER VEHICLE FAMILIES BY RATING, FUEL TYPE, AND EURO STANDARD



First TRUE results show that most diesel cars, including some of the recent 'Euro 6' vehicles, are in serious breach of health regulations.

A green rating is considered to encompass all vehicles with the lowest available in-use emissions. A red rating means that in-use emissions are higher than three times the latest Euro Standard emissions limits - these are the highest emitting vehicles in the fleet.



For more information:

www.trueinitiative.org **@TRUE_Emissions**

FIA FOUNDATION

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THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION