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**Disclaimer**



# uCARe consortium

# Document information

### Additional author(s) and contributing partners

| Name | Organisation |
|---|---|
| Partner managers | All consortium partners |
| | |

### Document Change Log

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| | Name | Date |
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| Verification Final Draft by WP leader | Catelijne Rauch | 3-11-2020 |
| Check before upload by coordinator | Paul Tilanus | 3-11-2020 |

# Executive summary

This document reports the dissemination activities performed in the first eighteen months of the project. This includes publication of all public deliverables on the uCARe website, online presentations, publications and other means of communication such as videos. Due to COVID-19 the most important events have been cancelled and presentations have been postponed to 2021.

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# Definitions & Abbreviations

| | |
|---|---|
| AEM | Augmented Emission Map[1] |
| DoA | Description of Action, a.k.a. DoW |
| DoW | Description of Work, a.k.a. DoA |
| NRMM | Non-Road Mobile Machinery |
| PCP | Pilot Contact Person |
| PDAB | Pilot and Dissemination Advisory Board |
| WP | Work Package |

[1] An AEM provides the pollutant emissions for a specific car model and make. The AEM shows how e.g. the NOx emissions depend on speed and CO2 for a hot engine, but also for a cold engine. Other engine maps include non-tailpipe emissions such as wear emissions from tires and brakes.

# 1 Introduction

## 1.1 Background uCARe

With four million people dying annually due to outdoor pollution, improvement of air quality has become one of society's main challenges. In Europe, traffic and transport have a large effect on air quality, specifically passenger cars and commercial vehicles and to a lesser extent non-road mobile machinery. While technical improvements and more stringent legislation have had a significant impact, traffic and transport emissions are still too high and air quality is still poor. Although the use of electric and other zero-emission propulsion technologies may drastically reduce the pollutant exhaust emissions from traffic, the slow introduction of such vehicles as well as the trend of increasing vehicle lifetimes means that vehicles with internal combustion engines are expected to dominate the fleet beyond 2030. This project is the first opportunity to improve emissions of vehicles, not by improving vehicle technology, but by actively involving vehicle users and enabling their contribution to clean driving.

So far, expertise on pollutant emissions has mainly been used to advise European policy makers on limited effectiveness of emission legislation (through real-world emission factors such as HBEFA and COPERT) and how to reduce traffic and transport pollutant emissions. The numerous mitigation methods are rarely extended to include the perspectives of users uCARe enables a next essential step: providing user targeted emission reduction measures. These measures will be implemented and evaluated in real-life pilot projects.

The overall aim of uCARe is *to reduce the overall pollutant emissions of the existing combustion engine vehicle fleet by providing vehicle users with simple and effective tools to decrease their individual emissions and to support stakeholders with an interest in local air quality in selecting feasible intervention strategies that lead to the desired user behaviour*. The overall aim is accompanied by the following objectives:

1. To identify **user-influenced vehicle emission aspects** (such as driving behaviour and vehicle component choice).
2. To determine the **emission reduction potential** of each vehicle emission aspect with help of the uCARe model developed within a toolbox.
3. To develop a **toolbox**, containing models and emission reduction measures, that enables stakeholders to identify the most appropriate intervention strategies that reflect the specific users and their motivation.
4. **Support policy makers** and other **stakeholders with an interest in air quality,** such as municipalities and branch organizations, **in identifying intervention strategies** that translate the measures into desired behaviour of the user.
5. **To test and evaluate** intervention strategies in a set of pilot projects conducted with various target user groups in at least four European countries. The pilot projects illustrate effectiveness and feasibility of the toolbox and intervention strategies developed on its basis.
6. Perform an **impact assessment** of the intervention strategies effectiveness, in terms of cost, penetration, achieved emission reduction and lasting effects.
7. **Actively feed** European cities and international parties with uCARe learning and results, via awareness raising campaigns, communication tools, interactive web application and other dissemination activities. Open access to the broad public to the toolbox, data and developed tools.
8. Summarise the findings **in blueprints for rolling out** different user-oriented emission reduction programmes, based on successful pilots.

This document is part of Work package 5, Communication and Dissemination and reports the Communication and Dissemination activities of the consortium in the first 1,5 year of the project.

## 1.2 Purpose of the document

This document gives an overview of the most important dissemination activities of the project in the first eighteen months.

## 1.3 Document Structure

Chapter 2 contains an update of the performed dissemination activities so far.
In Chapter 3 some conclusions and recommendations are made.
Annex A - D show some examples of dissemination material. The full set of dissemination materials is available on the website (see 2.1.1).

## 1.4 Deviations from original DoW

### 1.4.1 Description of work related to deliverable as given in DoW

Continuous reporting of dissemination, complemented by the production of the mid-term and final dissemination reports. Relevant dissemination material such as papers, leaflets, presentations, etc. will be annexed to the dissemination reports.

### 1.4.2 Time deviations from original DoW

No time deviations.

### 1.4.3 Content deviations from original DoW

No content deviations.

# 2 Updates on dissemination activities

The full dissemination report is in Part A. In this document the highlights are presented.

## 2.1 Website and Social Media

The website is the primary channel for disseminating the uCARe results. Via Social Media such as Twitter, Facebook and LinkedIn messages are sent out when new content is available on the website or when something interesting is happening related to uCARe.

### 2.1.1 Website

The website sitemap is as follows:


**Figure 2:1 uCARe website sitemap**

### 2.1.2 Twitter

Twitter (https://twitter.com/project_ucare) has being used to draw attention of our followers to the uCARe website. So far we only have seven followers. We are thinking about adding more tag-words.

### 2.1.3 Facebook

11 people are currently following the project via Facebook. We try to post regularly a short item there and thus draw attention to uCARe and related news items.

### 2.1.4 LinkedIn

At the moment the most successful medium is LinkedIn. We have 20 people interested in uCARe there.

## 2.2 Project deliverables

All public project deliverables are listed on the uCARe website.

| Title | Delivery date |
|---|---|
| D5.1 uCARe website | 22-7-2019 |
| D1.6 Guiding document for pollutant reducing operations and maintenance of NRMM, PTW and HD | 5-11-2019 |
| D1.1 Technology and Vehicle Taxonomy | 25-11-2019 |
| D2.1 Catalogue of requirements for the simulation method | 16-12-2019 |
| D1.3 Tampering | 19-12-2019 |
| D1.2 Augmented Emission Maps | 14-2-2020 |
| D1.4 Cheap and simple monitoring solutions | 26-5-2020 |
| D3.1 Interim description of intervention strategies and methodological details for implementation of measures | 29-10-2020 |
| D3.3 Interim results of the pilot projects in terms of user feedback and user awareness | 29-10-2020 |

**Table 2-1 List of public deliverables**

## 2.3 (Online) presentations

| Title | Where | Date |
|---|---|---|
| Ionization smoke detector based tool for particle number measurement (CVUT) | European Aerosol Conference | 25 – 30 August 2019 |
| General presentation of the uCARe project for EMPA board members | EMPA, Switzerland | 23-9-2019 |
| Webinars Crossyn | The Netherlands | 28-4-2020<br>14-5-2020<br>3-6-2020 |
| Identification of defunct diesel particle filters through roadside sampling (CVUT) | European Aerosol Conference (online) | 27 August – 1 Sept 2020 |
| Assessment of real-world primary emissions of reactive nitrogen species from mobile sources using molecular spectroscopy in mid-infrared region (CVUT) | 51th International Scientific Conference of Czech and Slovak University | 9 – 10 Sept 2020 |

**Table 2-2 List of (online) presentations**

## 2.4 Publications

| Title | Published in | date |
|---|---|---|
| Reducing pollutant emissions from existing passenger car fleet: generic approach to personalised recommendations (TNO/TUG) | Book of abstract of the TRA 2020 in Helsinki (event was cancelled but abstracts are online) | April 2020 |
| https://www.vti.se/sv/sysblocksroot/om-vti/vti-aktuellt/vti-aktuellt-nr-3-2020.pdf (VTI) | Article in "VTI aktuellt", VTI's magazine 3:2020 | September 2020 |
| Driver awareness of pollutants (UnLeeds) | Journal of Transport and Health | December 2020 |

**Table 2-3 List of publications**

## 2.5 Other dissemination activities

| Activity | Date | Partner |
|---|---|---|
| Dirtiest car of the Netherlands (Toyota) | 18-5-2019 | TNO |
| uCARe flyer available for hand-out | 20-1-2020 | TNO |
| POLIS workshop in Brussels | 6-2-2020 | TNO and VUB |
| Meeting with Milieu Centraal in Utrecht, the Netherlands | 12-3-2020 | TNO |
| 5 videos for citizen science produced and published on the website<br>CO meter<br>Exhaust PM (particle matter)<br>Swipe test<br>Brake PM (particle matter)<br>Driving style | April 2020 | TNO |
| Press release (in Flemish news)<br>https://www.vrt.be/vrtnws/nl/2020/02/28/meetapparatuur-vervuilende-wagens/ | 21-5-2020 | VUB |
| Press release about VTI participation in uCARe<br>https://www.vti.se/sv/nyheter/hur-du-kor-och-skoter-din-bil-paverkar-luftkvaliteten/ | 16-6-2020 | VTI |
| Animation on Emission maps | July 2020 | TNO |
| LinkedIn notice<br>https://www.linkedin.com/posts/vtisweden_hur-vi-k%C3%B6r-och-sk%C3%B6ter-v%C3%A5ra-bilar-p%C3%A5verkar-activity-6696345931966681090-yuhJ/ | August 2020 | VTI |
| Half-day web seminar for Swedish EPA and FORMAS (Swedish Research Council for Sustainable Development) | 7-9-2020 | IVL |

**Table 2-4 Other dissemination activities**

There are regular contacts with (members of) the CARES and MILE21 project in which some of the uCARe partners participate as well. In December 2019 bilateral cooperation with the MODALES project has been discussed.

# 3 Conclusions and recommendations

Due to COVID-19 it is more difficult to reach a broad (scientific) audience. The most important events for uCARe ( TAP 2020 and TRA 2020) have been cancelled without the possibility of giving an online presentation. For the TAP 2020 in Graz, two abstracts have been submitted: one on break wear emissions and one on FTIR measurements. A paper has been accepted with the title: 'Reducing pollutant emissions from existing passenger car fleet; generic approach to personalized recommendations'. This same abstract has been accepted by the TRA 2020 in Helsinki and has been published in their online book of abstracts. https://www.traficom.fi/sites/default/files/media/publication/TRA2020-Book-of-Abstract-Traficom-research-publication.pdf

The activities that could not be completed in the first eighteen months, have been planned in the update Communication plan D5.4. Due to the rapidly changing COVID-19 situation an adaptive planning approach also for the dissemination activities is recommended.

# Annex A

**uCARe flyer**

## Behavioural changes to reduce pollutant car emissions

uCARe
You Can Always Reduce Emissions
because you care

## And you are invited too...

**The uCARe project enables campaigns by cities, regions and NGOs to reduce pollutant emissions. The starting point is that drivers can emit less pollutant emissions by adapting their behavior. All materials for such a campaign are developed and subsequently tested with a pilot group. The lessons learned from the pilot, including the updated campaign materials, can be used for a full-scale roll-out of local measures to tackle air pollution.**

uCARe
Invites
your organisation!

Independent vehicle emission testing and research institutes from across Europe are collaborating via funding from the European Commission to make their knowledge and experience available to the widest audience for understanding vehicle emissions in the broadest sense. uCARe invites you as a stakeholder with an interest in improving air quality by reducing vehicle emissions to participate. The ultimate goal is to explore multiple options to reduce emissions and improve local air quality.

So far, expertise on pollutant emissions has mainly been used to advise European policy makers. The mitigation methods for national and local governments are rarely extended to include the perspectives of *users*. The uCARe project enables a next essential step to do so by providing user-targeted emission reduction measures. These measures will be implemented and evaluated in real-life pilot projects, in a collaboration of uCARe partners and you as a stakeholder representing a city, region or NGO.

## Together with stakeholders

**The active participation of cities, regions and NGOs is considered essential for successful pilots: you understand the local pollutant issues and know how to address the campaign target group(s). In cooperation with uCARe, you will select the right pilot participants for testing the campaign.**

The uCARe project can supply support to campaigns covering a wide spectrum as demonstrated by the examples in the following pages.

We offer e.g.:

- Simple driver feedback
- A "How clean is your car?" test campaign
- Simple emission test procedures to be done at home
- Vehicle monitoring

For individual car owners, information will be available on the environmental impact of their vehicle. At the same time, uCARe, together with you as a stakeholder, examines the users' psychological, social and economic incentives. Based on the combination of this knowledge, the most promising intervention strategies will be selected for full-scale campaigns later on. The active participation of stakeholders is considered essential for successful pilots. The campaigns cover a wide spectrum and are not limited to the examples: your ideas are welcome. The pilot projects will provide monitoring data and feedback from participants.

## Simple driver feedback

**Direct driving feedback encourages $NO_x$-conscious driving. A visual indication on the dashboard alerts the driver when $NO_x$ values measured at the tailpipe exceed a certain threshold value. In this way, participants become aware of the impact of their driving habits on high $NO_x$ emissions.**

uCARe will supply a sensor reader and indicator light for 25 – 30 participating vehicles as well as an easy installation guide. Participants are selected in advance by you as a uCARe stakeholder. Prior to the monitoring phase of the vehicle and its user, the baseline $NO_x$ emissions will be measured, followed by the installation of the simple feedback system. Through questionnaires uCARe will assess if this simple form of feedback can help drivers reduce their pollutant outputs.

Within this pilot, the feedback system can be moved on to other participants 1 or 2 times to extend the reach to 75-90 participants, each using the equipment for 2-3 months. This allows us to study a broad sample of drivers, and to monitor them over a substantial period of time.

## How clean is your car?

### Fairground/Parking lot event

**A portable monitoring booth, provided and manned by uCARe at one or more of your events, invites participants interested in sustainable driving to test their vehicles for pollutants. Such events could include car rallies, old-timer days, or fairs. In 15-30 minutes, a vehicle's performance with respect to soot and $NO_x$ emissions can be determined.**

Prior to the pollutant measurement, the car owner will be asked to complete a questionnaire and afterwards his/her response to the obtained values will be noted.


Follow-up advice will be given to the participating car owner after comparing the measured emissions with the limit values dictated by legislation, or supplied by manufacturers. This advice could include referral to information sources, or added maintenance recommendations.

The monitoring booth will be eye-catching, but the outreach of the event is much broader than only towards the participating owners. Information will also be provided to observers to raise the awareness of pollutant emissions and what can be done by the drivers to reduce these.

## DO try this at home

**Educational material helps participants investigate their own vehicles beyond official road-worthiness requirements. Tutorial videos and how-to guides outline small-scale tests that can be performed at home. Background information on how to interpret the measured results will also be provided. The tests include, for instance, a tissue-test for soot emitted by diesel vehicles, or using a simple household smoke detector to test for particulate emissions.**

This pilot is therefore also suitable for a larger group of participants and has virtually no age restrictions. Also, the roll-out after the pilot to a large target group is relatively easy.

During the pilot, uCARe will provide, in addition to all other educational materials, questionnaires to the participants to obtain feedback aimed at improving the effectiveness of this campaign material.

## Driving style and vehicle performance

**Broad range of trip-based feedback**

**In this type of pilot campaign, a participant's vehicle is monitored for 6 – 12 weeks to give a more in-depth and car-specific analysis. All resulting advice will therefore be specific to the car make and model.**

uCARe will provide up to 30 measurement devices and provide digital reports to the drivers, addressing different pollutant emissions. This pilot campaign is suited for participants who are interested in more technical feedback with regards to the performance of *their* vehicle, going beyond the generic advice.

Note that the availability of this pilot is expected from Autumn 2020, and that parameters are tailored to your interest as a stakeholder. Our focus is on a limited set of parameters to avoid the driver being overwhelmed by the digital report.

## The uCARe offer

uCARe is an H2020 project assisting cities/regions to reduce pollutant emissions.

Cities/regions that want to implement measures as presented in the examples on the previous pages or have their own ideas for a campaign, can receive assistance from the uCARe project.

The help consists of:

- design of the pilot and communication materials by professional psychologists trained in this domain
- creation of educational material
- running the pilot and receiving feedback and then advise on a large scale roll out

What we expect from the cities/regions is:

- reach out to participant drivers
- local communication

## Contact information

If you are interested in the uCARe offer above, please contact our pilots coordinator:

Savas Geivanidis

aki@auth.gr

If you want general information about the uCARe project, please have a look at

https://www.project-ucare.eu/

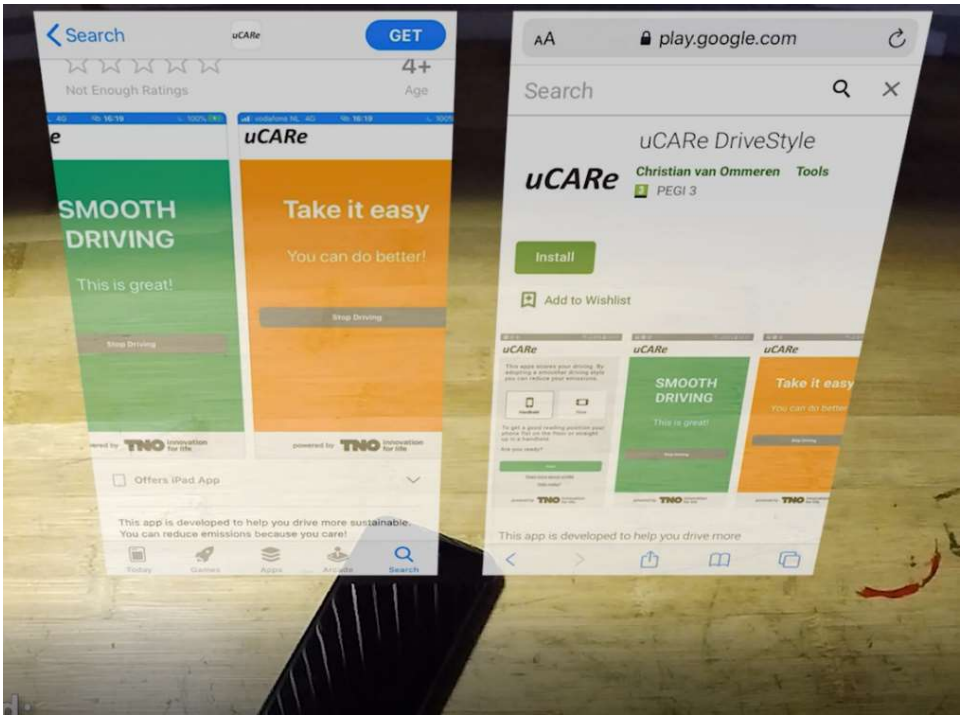
# Annex B

## Citizen science videos

### DIY CO meter test


**DIY swipe exhaust test**

**DIY Driving style app**



## Annex C

**Presentation at the European Aerosol Conference 2019**

# Ionization Smoke Detector Based Tool for Particle Number Measurement: Detection of Defective Diesel Particle Filters and of Nanoparticles in Workplace

European Aerosol Conference 2019 – O1_F4_S Low-Cost PMSensors – backup talk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uCARe You Can Always Reduce Emissions because you care

# Annex D

## Emission maps animation