GA 815002

Deliverable number: D5.7
Deliverable title: Dissemination report (final)

Document ID: uCARe-D5.7-v1.0
Dissemination level: Public
Main Author: Catelijne Rauch (TNO)
Issue date: 28-10-2022

Disclaimer and acknowledgement

This project has received funding from the European Union's Horizon 2020 Programme Research and Innovation action under grant agreement No 815002

Disclaimer

uCARe consortium

Document information

Additional authors and contributing partners

Name	Organisation
Partner managers	All consortium partners

Document Change Log

Version	Date	Comments
v0.1		First draft of document
v0.x		Revised version based on the inputs of most partners
v1.0		First final version, approved by Executive Board, (will be) submitted to EC.

Document Distribution Log

Version	Date	Distributed to
v0.1		All partner managers
V0.2		All partner managers
V1.0		EC

Verification and approval

	Name	Date
Verification Final Draft by WP leader	Catelijne Rauch	27-10-2022
Check before upload by coordinator	Geoff Holmes	28-10-2022

Executive summary

This document reports the dissemination activities performed in the 42 months of the project. This includes publication of all public deliverables on the uCARe website, online presentations, (scientific) publications and other means of communication such as videos. The Zenodo website has proven to be the most effective form of online dissemination of uCARe results and this is verified by the number of downloads of uCARe resources. Further successful dissemination of results was performed at a number of events both externally and internally organised. This includes presentations given at the ITS conference in 2021 and VEHITS in 2022. Finally, dissemination was also performed via a number of publications and other activities including press releases, online presentations and animations.

Due to COVID-19 restrictions reaching a broad (scientific) audience was made challenging in the uCARe project. Despite this, traditional and alternative channels were successfully pursued to disseminate results. Dissemination will continue after the completion of uCARe via the uCARe website (until expiry) and indefinitely via the Zenodo page.

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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.

1.3 Document Structure

Chapter 2 contains an overview of the performed dissemination activities in the project. In Chapter 3 conclusions are drawn and recommendations are made. Annex A - F show some examples of dissemination material. The full set of dissemination materials is available on the website (see 2.2.1).

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

Because of the COVID-19 pandemic the project has been extended with six months. Therefore the deliverable due date has been postponed with six months.

1.4.3 Content deviations from original DoW

No content deviations.

2 Updates on dissemination activities

The full dissemination report was submitted in the Part A periodic review. In this document the highlights are presented. This includes an overview all dissemination channels and activities including the uCARe website, social media, project deliverables, presentations, publications and other dissemination activities.

2.1 COVID19 and dissemination

Due to COVID-19 restrictions reaching a broad (scientific) audience was made challenging in the uCARe project. This was due to the fact that the most important events for uCARe (TAP 2020 and TRA 2020) were cancelled without the possibility of giving an online presentation. Despite this a number of dissemination activities were still carried out.

Also because of the COVID-19 pandemic, pilots have been performed with small groups of participants and the opportunities for disseminations among the external stakeholders was more challenging. This was however still achieved via the pilot and dissemination advisory board and the final dissemination event.

2.2 Website and Social Media

The website (https://project-ucare.eu) is the primary channel for disseminating the uCARe results. Additionally, the Zenodo platform is used for sharing data and making the augmented emission maps publicly available. Via Social Media such as Twitter, Facebook and LinkedIn, messages are sent out when new content is made available on the website or when of interest happened within the uCARe project.

2.2.1 Website

The website sitemap is as follows:

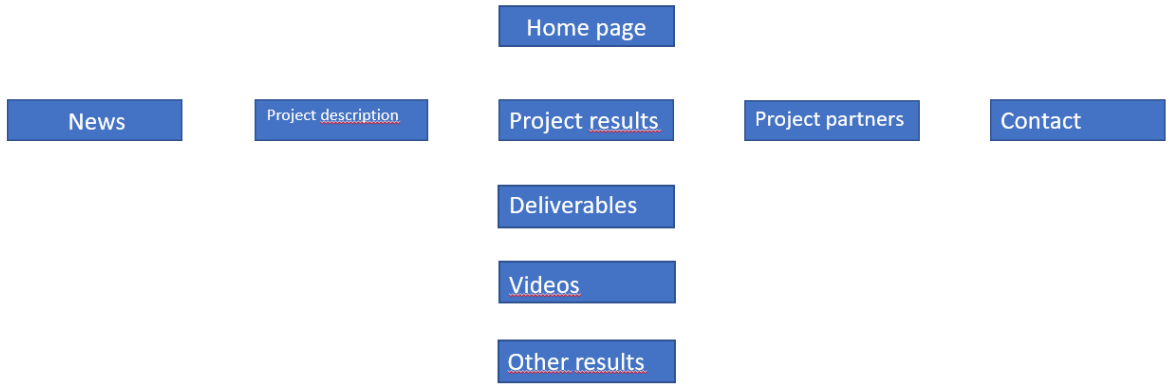


Figure 2:1 uCARe website sitemap

2.2.2 Zenodo

The uCARe page on the Zenodo website (https://zenodo.org/communities/ucare) is the most effective platform we have used thus far for sharing results. In total 48 augmented emission map packages have been shared from the uCARe project on this platform and this is freely accessible to the public. The total number of downloads of the files shared on Zenodo exceeds 12,000. This highlights the strength of the augmented emission map for sharing data.

2.2.3 Twitter

Twitter (https://twitter.com/project_ucare) has being used to draw attention of our followers to the uCARe website. Unfortunately, we have not been able to attract more followers (10) then when we started.

2.2.4 Facebook

23 people are currently following the project via Facebook (https:// www.facebook.com/profile.php?id=100064494770976). Regular posts of short items were done to draw attention to uCARe and related news items.

2.2.5 LinkedIn

The uCARe linkedin page (https:// www.linkedin.com/groups/8893136/) currently has 35 interested people. This channel was also used to post news items relating to uCARe.

2.3 Project deliverables

All public project deliverables are listed on the uCARe website. Table 2-1 shows the full overview of deliverables and the delivery date of each of these.

Table 2-1 List of public deliverables

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 v4	26-10-2022
D5.2 Dissemination and Communication plan	27-2-2020
D1.4 Cheap and simple monitoring solutions	26-5-2020
D5.3 Exploitation plan	7-10-2020
D1.5 Citizen Science on pollutant emissions	22-10-2020
D3.3 Interim results of the pilot projects in terms of user feedback and user awareness	29-10-2020
D1.2 Augmented Emission Maps v2	2-11-2020
D5.4 Dissemination and Communication plan update	3-11-2020
D5.5 Dissemination report (mid-term)	3-11-2020

D3.1 Interim description of intervention strategies and methodological details for implementation of measures	29-10-2020
D3.2 Interim results of the pilot projects in terms of achieved emission reduction	26-11-2020
D4.1 Preliminary ranking of consumer behaviour measures by effectiveness	17-12-2020
D3.3 Interim results of the pilot projects in terms of user feedback and user awareness v.2	16-2-2021
D2.2 Software for online and for trip analysis in post-processing with car owner guidelines	31-01-2022
D4.3 Report targeted towards policymakers, on impact of measures	31-01-2022
D4.4 Report targeted towards policymakers, on impact of measures.	30-09-2022
D4.5 Report on expected air quality impact, including maps showing pollution concentrations.	11-10-2022
D4.2 Updated ranking of measures, reflecting likeliness of success	31-10-2022
D3.4 Final description of intervention strategies and methodological details for implementation of measures.	31-10-2022
D3.5 Final results of pilot projects in terms of achieved emission reduction.	31-10-2022
D3.6 Final results of the pilot projects in terms of user feedback and user awareness.	31-10-2022
D5.6 Exploitation report	28-10-2022
D5.7 Dissemination report	28-10-2022

2.4 (Online) scientific presentations

A number of presentations were given within the uCARe project reaching a broad audience. Table 2-2 shows the full list of presentations given within the context of the uCARe project. This includes scientific conferences, but also meetings with relevant stakeholder groups.

Table 2-2 List of (online) presentations

Title	Where	Date
Ionization smoke detector based tool for particle number measurement (CVUT) (Annex C)	European Aerosol Conference	25-08-2019 – 30-08-2019

General presentation of the uCARe project for EMPA board members	EMPA, Switzerland	23-09-2019
Webinars Crossyn	The Netherlands	28-04-2020, 14-05-2020 30-06-2020
Identification of defunct diesel particle filters through roadside sampling (CVUT)	European Aerosol Conference (online)	27-08-2020 – 1-08-2020
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	9-09-2020 – 10-09-2020
Portable, on-board FTIR spectrometers: A universal tool for real-world monitoring of greenhouse gases, reactive nitrogen compounds, and other gaseous pollutants?	24th Transport and Air Pollution Conference	30-03-2021 – 1-04-2021
A virtual PEMS for Eco Driver training	24th Transport and Air Pollution Conference	30-03-2021 – 1-04-2021
Webinar about AEM (Augmented Emission Maps) (Annex E)	TNO, online	19-04-2021
Investigation of the dynamics of the NOx aftertreatment of a light-duty commercial vehicle with an on-board FTIR analyser during motorway operation.	52th International Scientific Conference of Czech and Slovak University Departments and Institutions	22-09-2021 – 23-09-2021
On-road detection of trucks with high NOx emissions from a patrol vehicle with on-board FTIR analyser	The Science of the Total Environment 738 ISSN 0048-96	10-10-2020
Augmented Emission Maps An essential new tool to give individualised emission feedback	27th ITS World Congress, Hamburg, Germany	11-10-2021 – 15-10-2021
Analysing driver's willingness and effectiveness to apply ecodriving (Annex G)	VEHITS 2022	27-04-2022 - 29-04-2022

2.5 Publications

A number of publications were written within uCARe. Table 2-3 shows the full list of publications produced within the project. This includes publications via scientific conferences and also publication via the Zenodo platform.

Table 2-3 List of 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)	28-04-2020
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	01-09-2020
Effects of braking conditions on nanoparticle emissions from passenger car friction brakes.	The Science of the Total Environment.	20-09-2021
High NO2 Concentrations Measured by Passive Samplers in Czech Cities: Unresolved Aftermath of Dieselgate?	Atmosphere	19-05-2021 https://doi.org/10.3390/atmos12050649
A virtual PEMS for Eco Driver training	TAP 2021	30-03-2021 – 01-04-2021
Augmented emission maps are an essential new tool to give individualised emission feedback	27th ITS World Congress, Hamburg, Germany	11-10-2021 - 15-10-2021
Zenodo publications	Zenodo.org	https://zenodo.org/communities/ucare

In addition to the table above, a paper on the results of the interviews will be submitted to the International Journal of Sustainable Transportation.

2.6 Other dissemination activities

In addition to presentations and publications a number of additional dissemination activities were carried out within the uCARe project. Table 2-4 provides a full overview of these activities.

Table 2-4 Other dissemination activities

Activity	Date	Partner
Dirtiest car of the Netherlands (Toyota)	18-5-2019	TNO
Press release about IVL participation in uCARe https://www.ivl.se/english/ivl/our-offer/research-projects/transport/ucare-tool-to-reduce-vehicle-fleet-emissions.html	11-08-2019	IVL
We monitor emissions – uCARe are mentioned in this press release (in Swedish) https://www.ivl.se/press/reportage/reportage/2019-09-11-vi-overvakar-utslappen.html	11-09-2019	IVL
uCARe flyer available for hand-out (Annex A)	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 (Annex B) CO meter Exhaust PM (particle matter) Swipe test Brake PM (particle matter) Driving style	26-05-2020	TNO
Press release (in Flemish news) https://www.vrt.be/vrtnws/nl/2020/02/28/meetapparatuur-vervuilende-wagens/	21-5-2020	VUB
Press release about VTI participation in uCARe https://www.vti.se/sv/nyheter/hur-du-kor-och-skoter-din-bil-paverkar-luftkvaliteten/	16-6-2020	VTI
Animation on Emission maps (Annex D)	01-07-2020	TNO
LinkedIn notice 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/	01-08-2020	VTI
Half-day web seminar for Swedish EPA and FORMAS (Swedish Research Council for Sustainable Development)	07-09-2020	IVL
Beyond Euro 6/VI: Why we need to continue reducing emissions from mobile sources: The current state and the possibilities for future legislation. Invited lecture at the Czech Automotive Society seminar.	25-02-2021	CVUT
No car is entirely ecological, electric cars are better suited for short local trips (Czech Radio) https://plus.rozhlas.cz/expert-na-emise-zcela-ekologicke-neni-zadne-auto-elektromobily-se-hodi-na-kratsi-8400125		CVUT
Reducing speed to 30 km/h in the cities – this would induce more children and parents to commute to schools by bike	29-09-2021	CVUT

rather than by cars (Czech Radio talk show) https://plus.rozhlas.cz/tricitkou-ve-mestech-deti-mohly-jezdit-do-skoly-na-kole-ne-autem-predpovida-8586850		
The reality of automobile emissions legislation (national press) https://www.tyden.cz/rubriky/auta/jak-je-to-s-emisnimi-normami-u-aut_532910.html	24-09-2019	CVUT
Protect the citizens, reduce the load on our doctors: Leave your high emitting cars at home. Public call to motorists issued by Czech Tech Univ and adopted by others, i.e. https://www.cistoustopou.cz/autem/clanek/vyzva-profesora-vojtiska-motoristum-chrante-obcany-ulevte-zdravotnikum-1590 https://ekolist.cz/cz/publicistika/nazory-a-komentare/michal-vojtisek-auta-s-odmontovanymi-filtry-nechte-doma.castice-zvysuji-riziko-nakazy-koronavirem	22-10-2020	CVUT
Local effects of inland waterway boat traffic on air quality, and how they can be reduced (news article in national environmental journal) https://ekolist.cz/cz/zpravodajstvi/zpravy/lodni-doprava-ve-mestech-muze-byt-lokalne-neprijemny-problem.co-s-nim	12-06-2021	CVUT
Infographics to be used for instruction interviewees (Annex F)	03-11-2021	TNO, IVL, LEEDS
Air pollution in Prague exceeds legislative limits – high number and poor technical conditions of vehicles is detrimental to public health https://mestemnakole.cz/2021/10/stav-prazskeho-ovzdusi-prekracuje-limity-enormni-pocet-aut-skodi-zdravi-obyvatel/	19-08-2022	CVUT
Presentation at ERMES plenary meeting	11-10-2022	TNO
Presentation at DIAS final dissemination event	25-10-2022	TNO + LAT
Online uCARe final dissemination event	25-10-2022	TNO, TUG, LAT, VTI, VUB, INFRAS, LEEDS, IVL

2.7 Contact with other projects

There have been some contacts with (members of) the CARES and MILE21 project in which some of the uCARe partners participate as well. Additionally, there is contact with the DIAS H2020 project. In December 2019 bilateral cooperation with the MODALES project has been discussed.

3 Conclusions and recommendations

Due to COVID-19 restrictions reaching a broad (scientific) audience was made challenging in the uCARe project. This was due to the fact that the most important events for uCARe (TAP 2020 and TRA 2020) were cancelled without the possibility of giving an online presentation. In 2021 the first scientific meetings were organized again. uCARe participated in the ITS World Congress in Hamburg in 2021 with a presentation by TNO, and a presentation at the VEHITS in 2022 (Annex E).

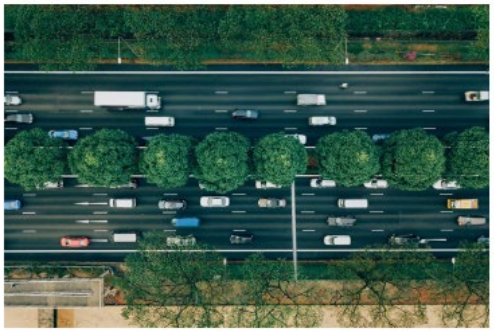
Dissemination was also performed via a number of online sources. This includes dissemination via the uCARe website, social media and Zenodo. The Zenodo website has proven to be the most effective form of online dissemination of uCARe results and this is verified by the number of downloads of uCARe resources. Moreover, dissemination of results was performed at a number of events both externally and internally organised. Additionally, a number of publications were also written to disseminate the results. Finally, dissemination was also performed via a number of other activities including press releases, online presentations and animations.

In conclusion, the dissemination of uCARe results was partly affected by COVID19 restrictions, but alternative channels were successfully pursued to disseminate results. Dissemination will continue after the completion of uCARe via the uCARe website (until expiry) and indefinitely via the Zenodo page.

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.

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/

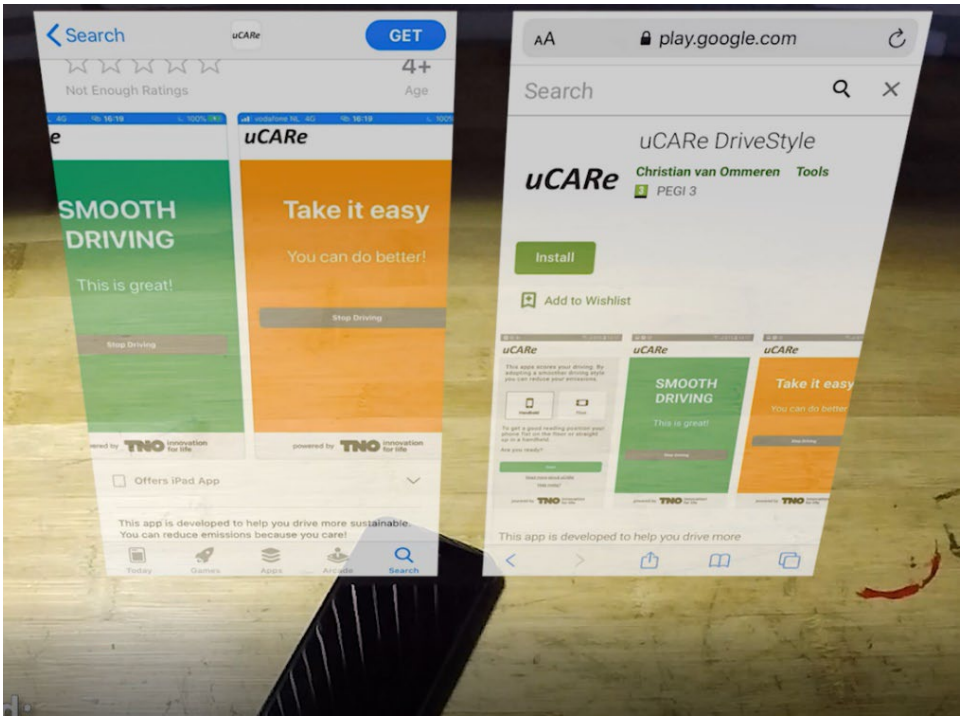
Annex B

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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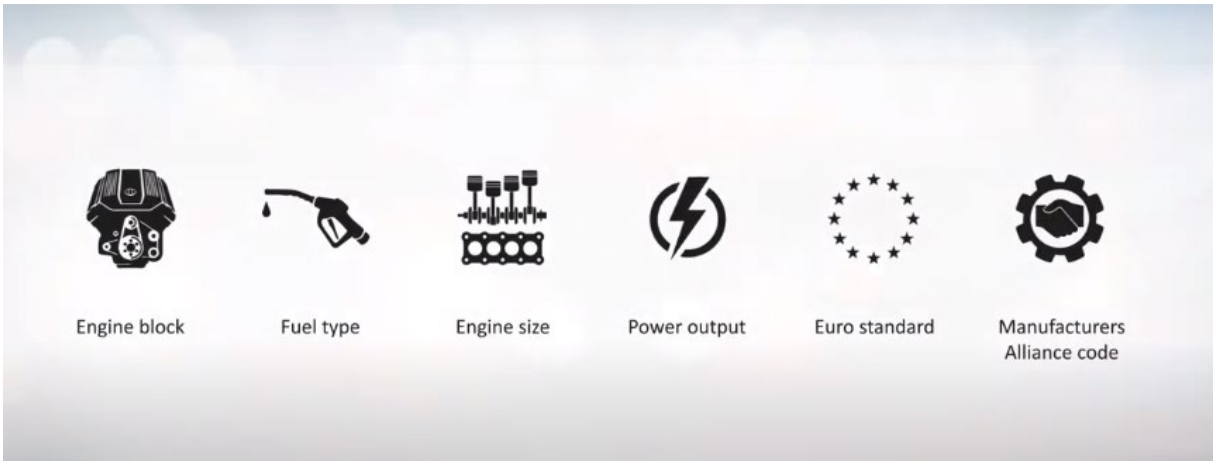
ÚSTAV CHEMICKÝCH PROCESŮ AV ČR INSTITUTE OF CHEMICAL PROCESS FUNDAMENTALS OF THE ASCR

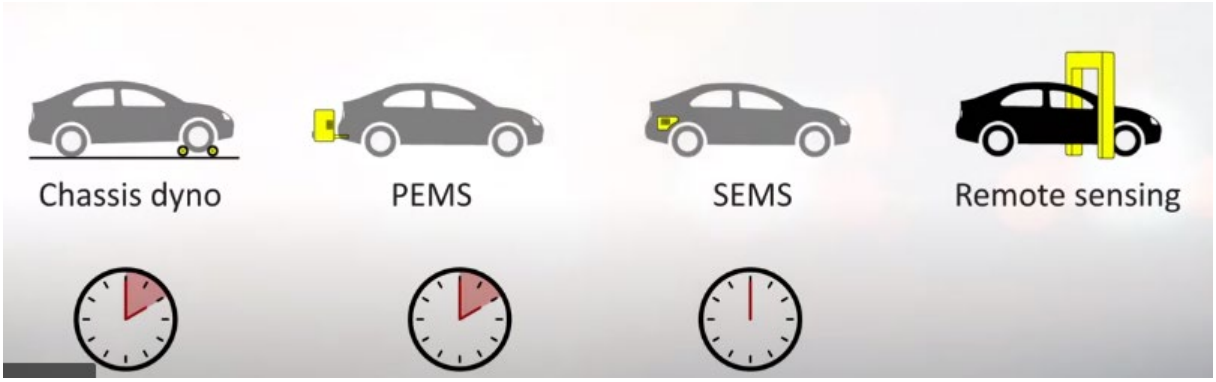
TECHNICAL UNIVERSITY OF LIBEREC Faculty of Mechanical Engineering

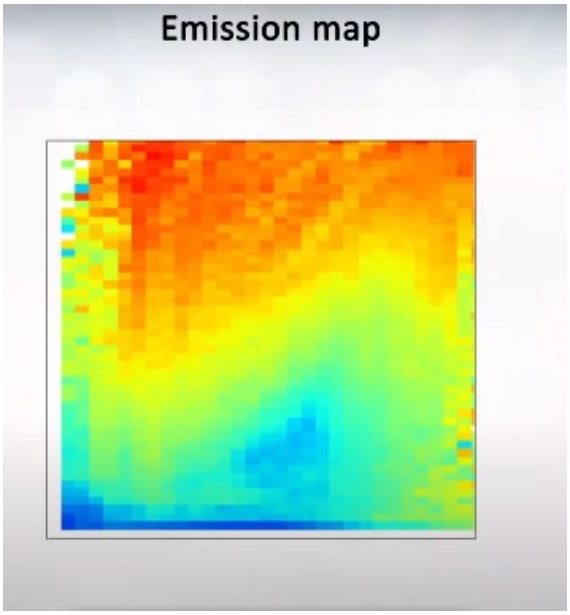
uCARe You Can Always Reduce Emissions because you care

Annex D

Emission maps animation

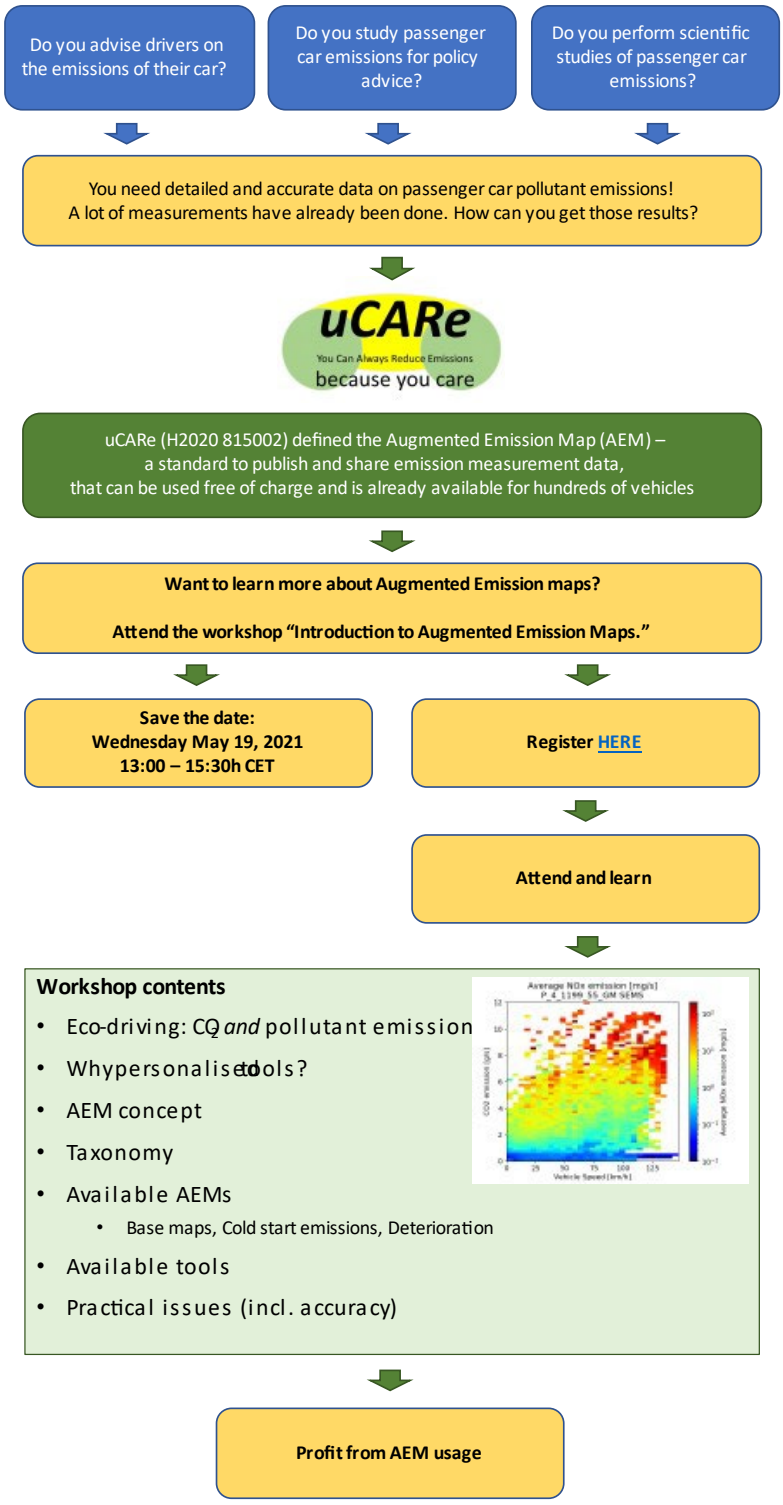






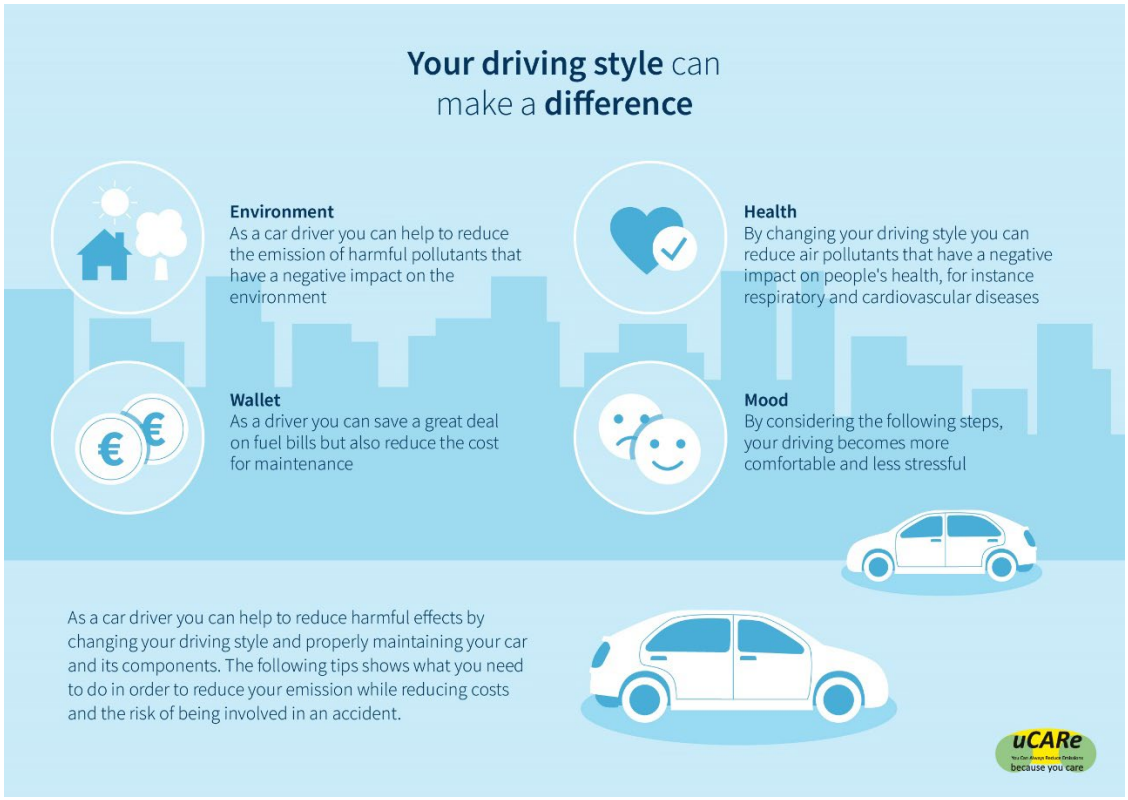
Annex E

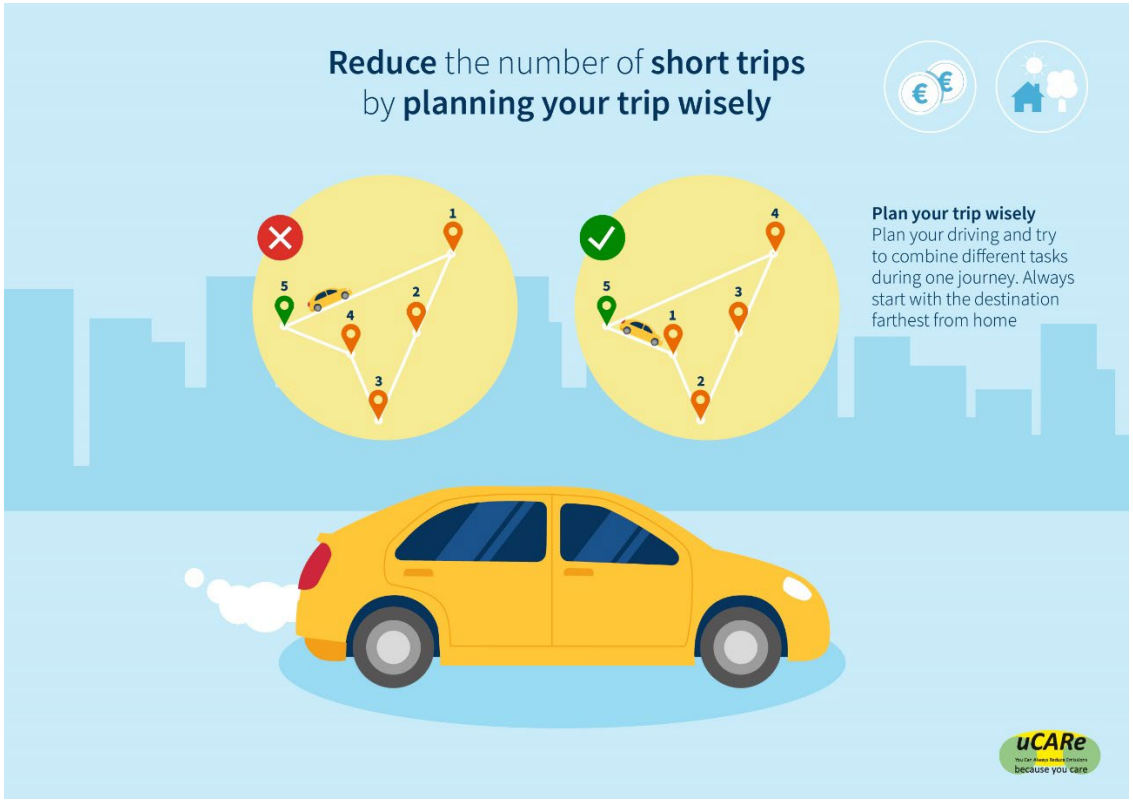
Webinar AEM (Augmented Emission Maps)

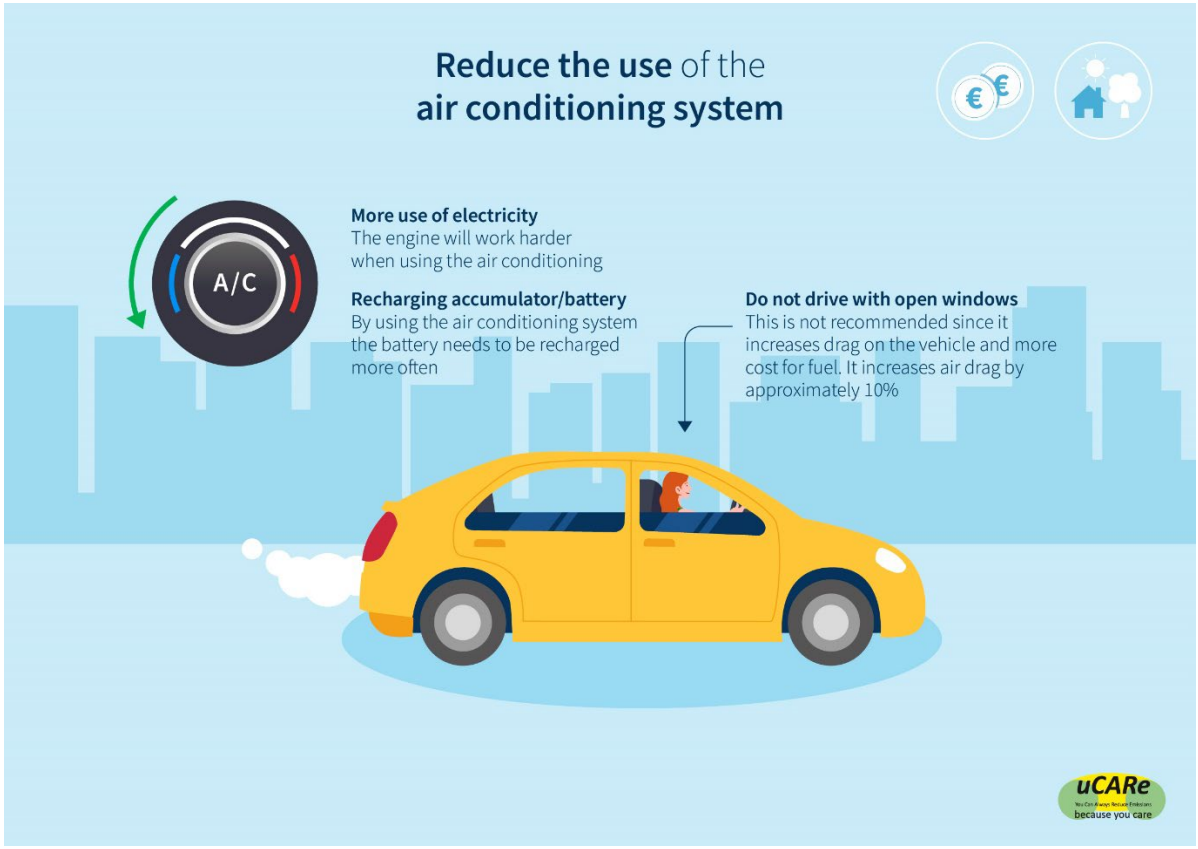


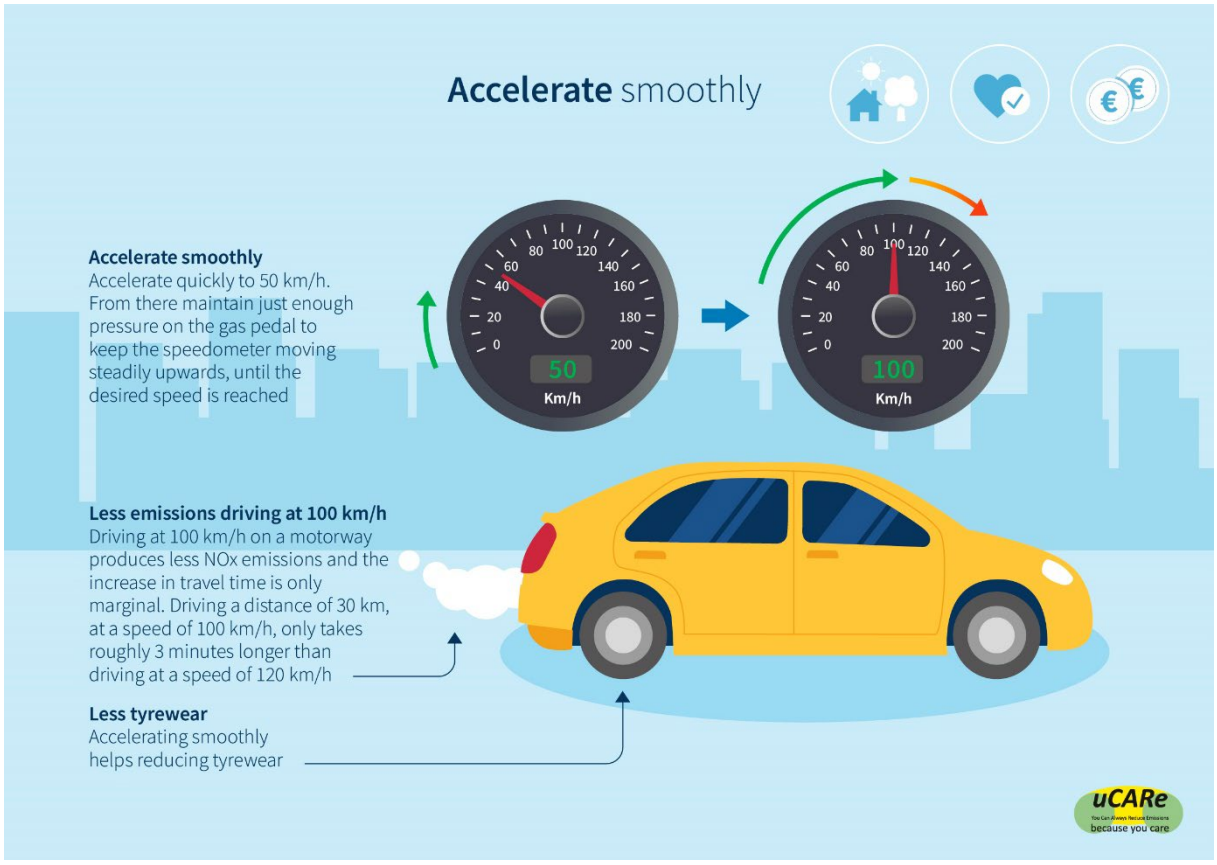
Annex F

Infographics for interviewees






Reduce the use of the
air conditioning system
A/C
More use of electricity
The engine will work harder
when using the air conditioning
Recharging accumulator/battery
By using the air conditioning system
the battery needs to be recharged
more often
Do not drive with open windows
This is not recommended since it
increases drag on the vehicle and more
cost for fuel. It increases air drag by
approximately 10%
uCARe
because you care


Accelerate smoothly
Accelerate smoothly
Accelerate quickly to 50 km/h.
From there maintain just enough
pressure on the gas pedal to
keep the speedometer moving
steadily upwards, until the
desired speed is reached
50
Km/h
100
Km/h
Less emissions driving at 100 km/h
Driving at 100 km/h on a motorway
produces less NOx emissions and the
increase in travel time is only
marginal. Driving a distance of 30 km,
at a speed of 100 km/h, only takes
roughly 3 minutes longer than
driving at a speed of 120 km/h
Less tyrewear
Accelerating smoothly
helps reducing tyrewear
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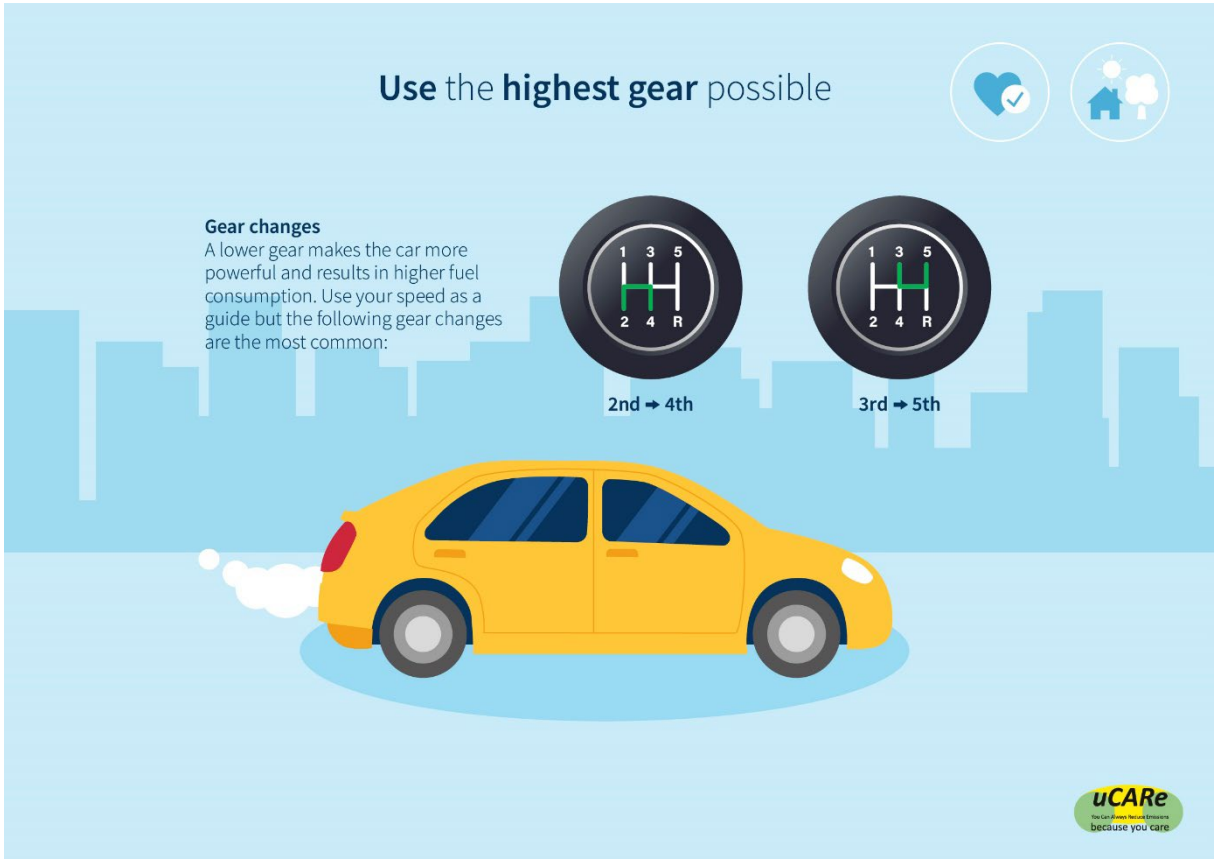
because you care


Use the highest gear possible
Gear changes
A lower gear makes the car more powerful and results in higher fuel consumption. Use your speed as a guide but the following gear changes are the most common:
1 3 5
2 4 R
2nd ➡ 4th
1 3 5
2 4 R
3rd ➡ 5th
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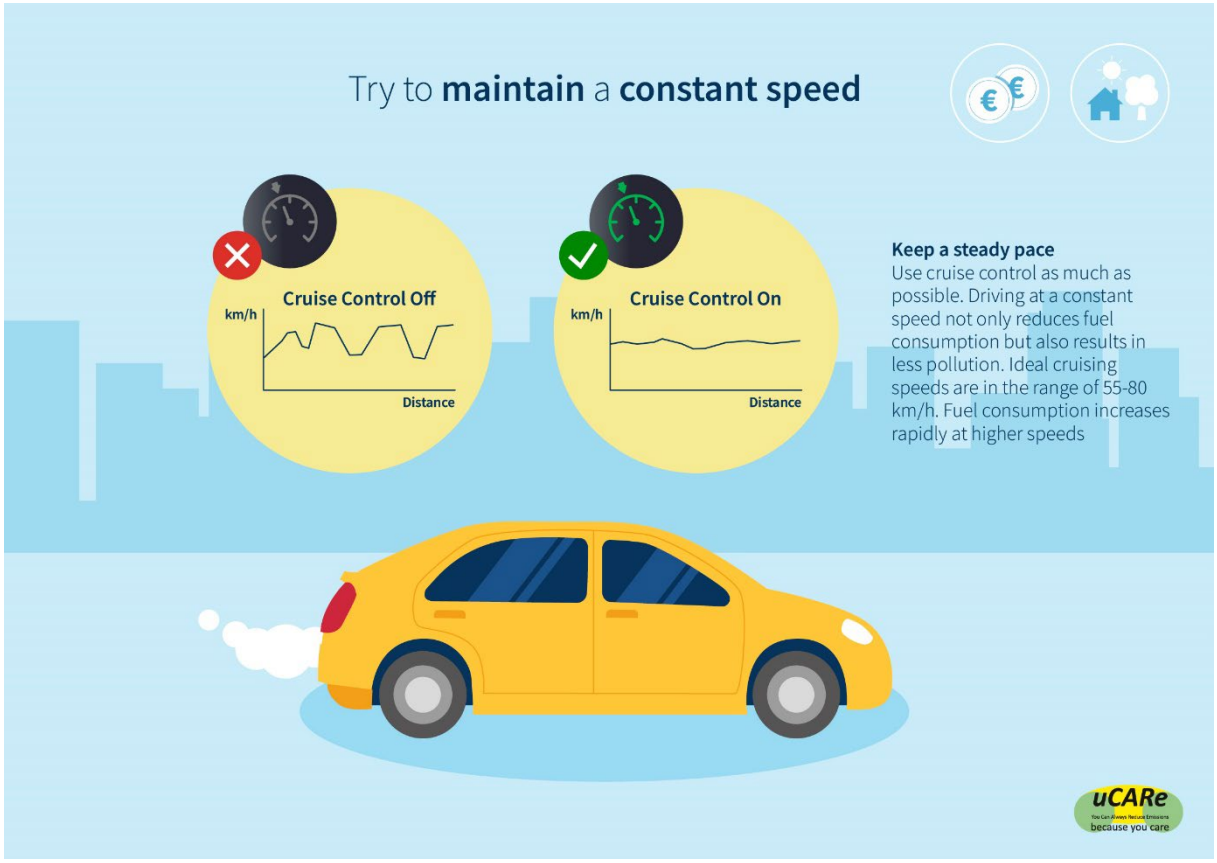
because you care


Try to maintain a constant speed
Cruise Control Off
km/h
Distance
Cruise Control On
km/h
Distance
Keep a steady pace
Use cruise control as much as possible. Driving at a constant speed not only reduces fuel consumption but also results in less pollution. Ideal cruising speeds are in the range of 55-80 km/h. Fuel consumption increases rapidly at higher speeds
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Avoid harsh braking
Use the foot brake gently or use engine braking
Brake gently and in good time. Try to avoid approaching a stop, or another car, at a high speed and then braking hard
If you anticipate a stop ahead, it pays to simply release the accelerator pedal and reduce speed slowly and hope that it will turn green. A car that is using its engine to brake consumes no fuel
Emissions from aggressive driving
Compared with eco-driving, aggressive driving uses more fuel and emits more emission of CO2 and NOx. For NOx it can be more than a 40% increase
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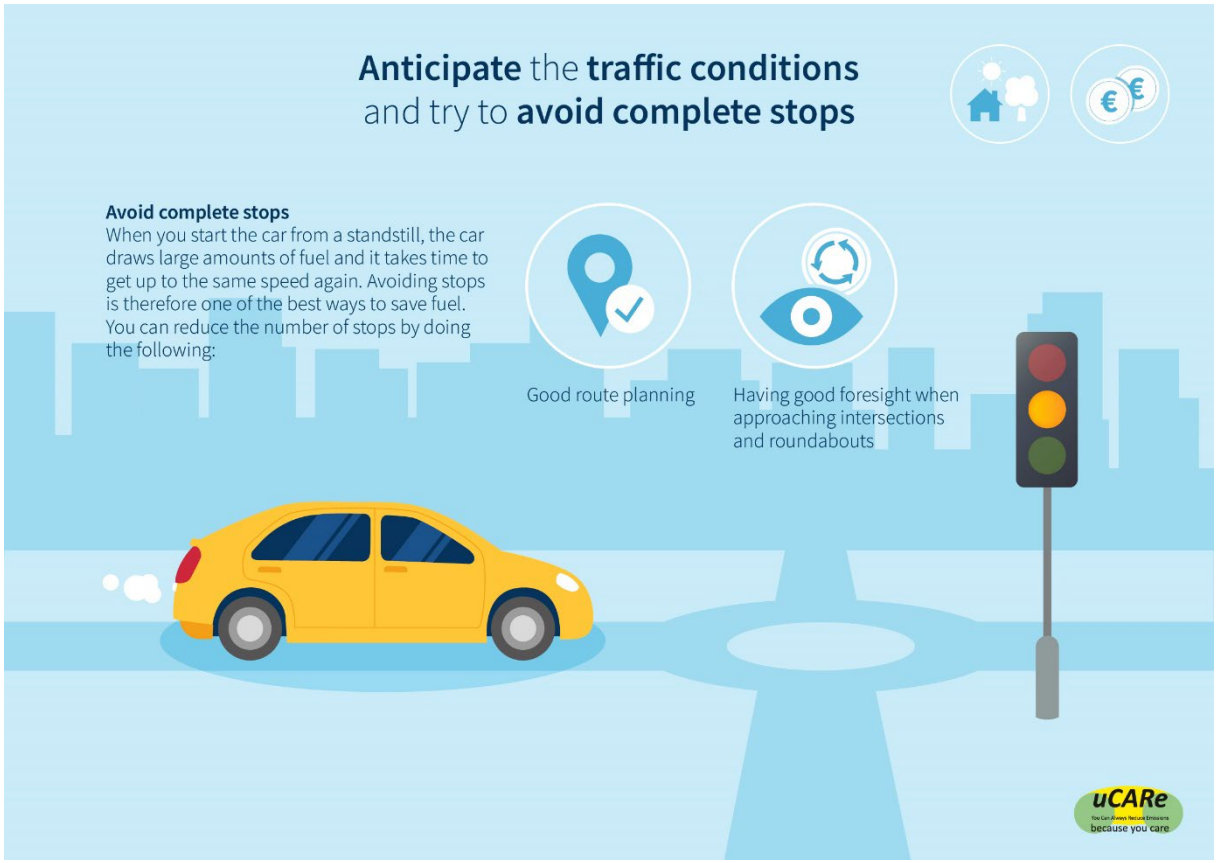
because you care


Anticipate the traffic conditions and try to avoid complete stops
Avoid complete stops
When you start the car from a standstill, the car draws large amounts of fuel and it takes time to get up to the same speed again. Avoiding stops is therefore one of the best ways to save fuel. You can reduce the number of stops by doing the following:
Good route planning
Having good foresight when approaching intersections and roundabouts
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Do **not idle** for more than **30 seconds**
Apply the 30-second rule
If the waiting time is longer than 30 seconds, it is recommended that you switch off the engine. An idling engine releases exhaust fumes and is therefore bad for the environment and your pocket. While you are idling or keeping your engine running while stationary, your car is polluting the environment. It also increases fuel consumption
30 seconds
Emissions from idling
The NOx emission from idling can contribute up to 36% of the total NOx emission of a 100 km-trip
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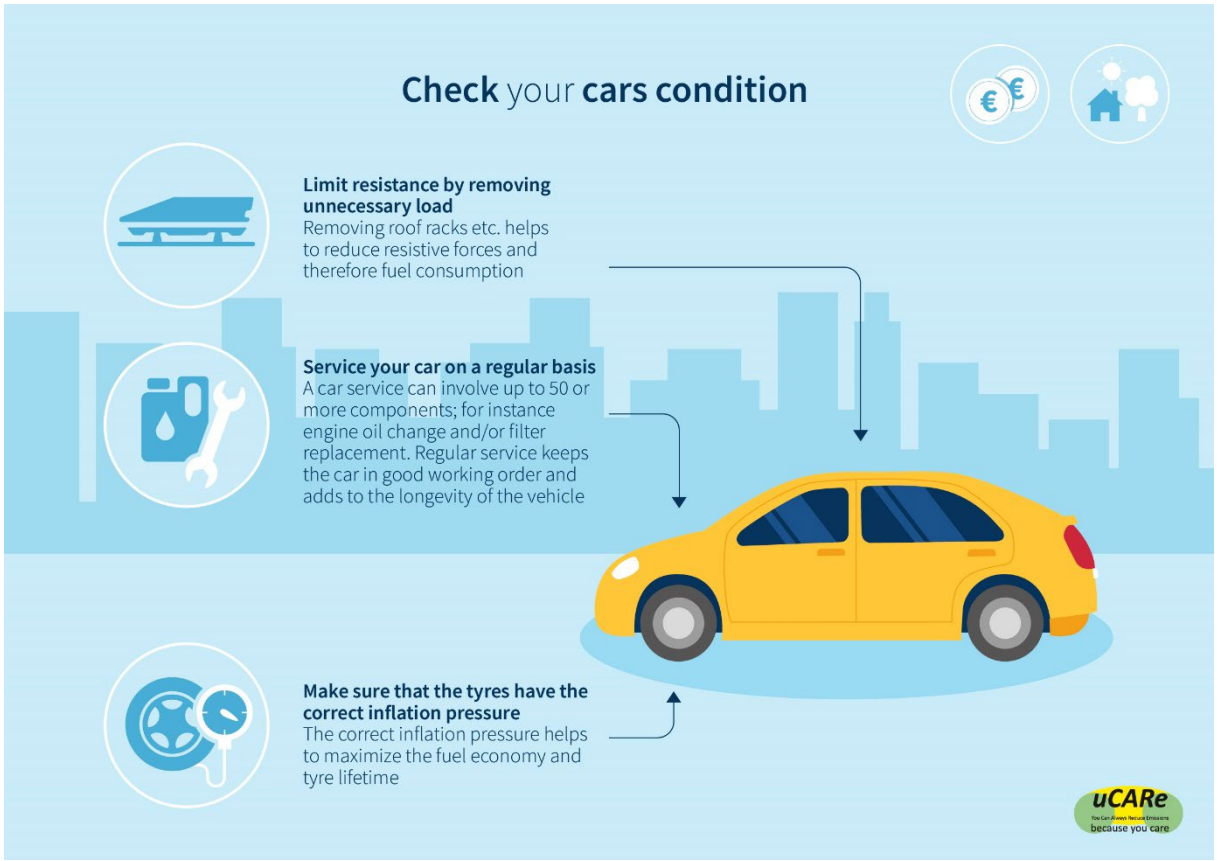
Check your **cars condition**
Limit resistance by removing unnecessary load
Removing roof racks etc. helps to reduce resistive forces and therefore fuel consumption
Service your car on a regular basis
A car service can involve up to 50 or more components; for instance engine oil change and/or filter replacement. Regular service keeps the car in good working order and adds to the longevity of the vehicle
Make sure that the tyres have the correct inflation pressure
The correct inflation pressure helps to maximize the fuel economy and tyre lifetime
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Annex G

Poster presentation VEHITS 2022