

CLEANER URBAN AIR BY RETROFIT FILTRATION DEVICES



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INTRODUCTION

WHAT IS AEROSOLFD?

Fast track

to cleaner, healthier urban Aerosols

by

market ready Solutions

for

- tailpipe,
- brake systems
- and (semi-)closed environments

of retrofit

Filtration DeVICES



EU CO-FUNDED INNOVATION ACTION



- Grant agreement ID: 101056661
- Topic: HORIZON-CL5-2021-D5-01-15 - Development and demonstration of cost affordable and adaptable retrofit solutions for tailpipe and brake polluting emissions
- Timing: 2022/05 – 2025/04 (36 months)
- EU contribution: € 5.00 million
- Total cost: € 8.22 million
- Coordinator: MANN+HUMMEL



CONSORTIUM

- 16 Partners

MANN+HUMMEL

AUVASA



CARTIF



INTEC
INSTITUTO DE TECNOLOGIA COMPORTAMENTAL



- 8 Countries

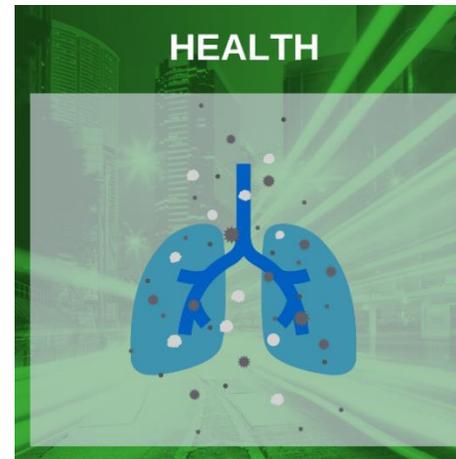
- About a dozen demo sites



CONCEPT & APPROACH

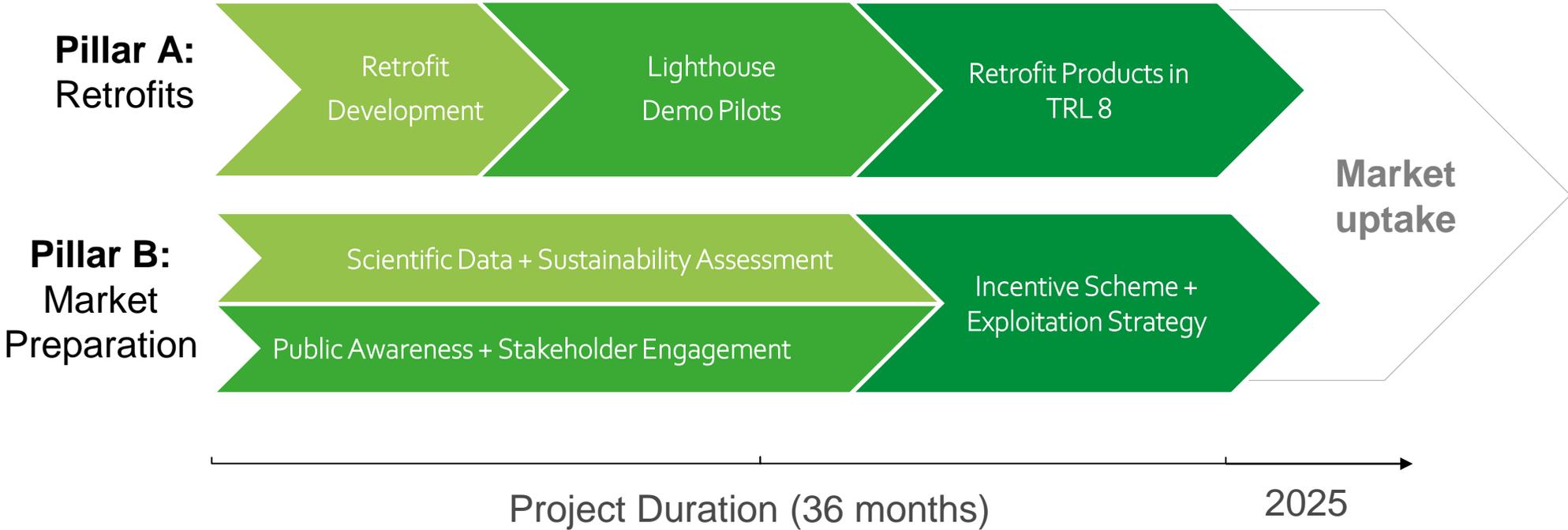
CHALLENGE & PROPOSAL

- Traffic is a significant contributor to air pollution
- Harmful effects of traffic-related ultrafine particles on:



- Aim/Proposal: **reducing** traffic-related emissions

FAST TRACK TO ...

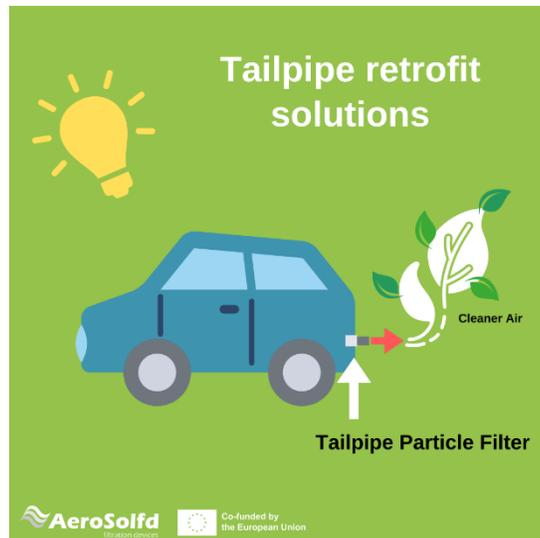


... CLEANER URBAN AIR

BY RETROFIT FILTRATION DEVICES

- AeroSolfd Solutions:

Reducing tailpipe emissions



Reducing brake emissions



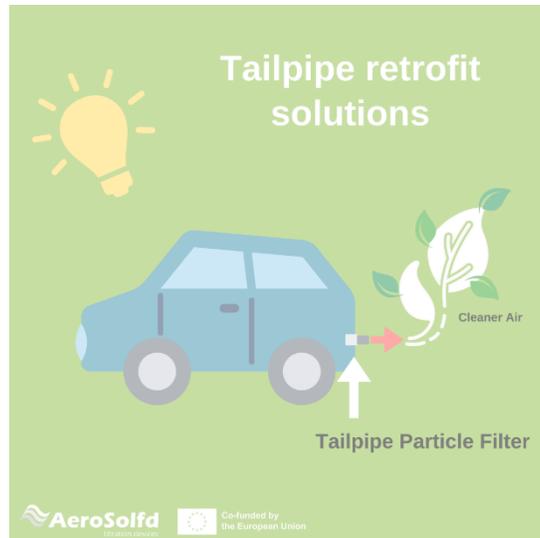
Reducing pollution
in (semi-)closed environments



BY RETROFIT FILTRATION DEVICES

- AeroSolfd Solutions:

Reducing tailpipe emissions



Reducing brake emissions



Reducing pollution
in (semi-)closed environments



Next talk: Dr Rubino

REDUCING BRAKE EMISSIONS

BRAKE DUST PARTICLE FILTER

Solution for passenger cars
already at TRL6

Bus and commercial vehicles with similar brake
systems

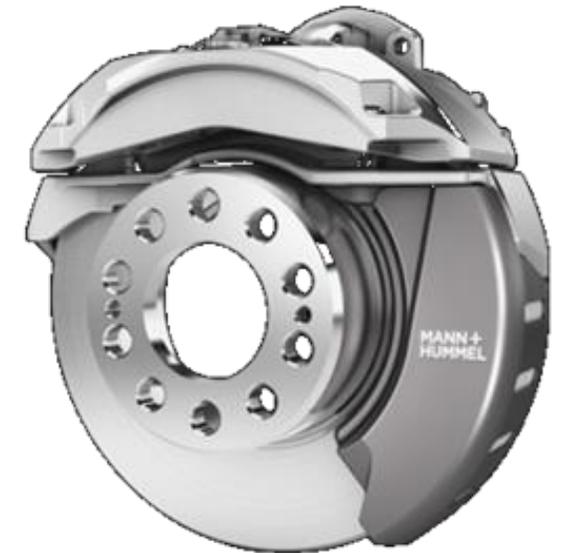
→ Transfer of existing concept

Train/metro brake system different

→ Other solution preferred

→ Retrofit of Stationary Filters @ stations

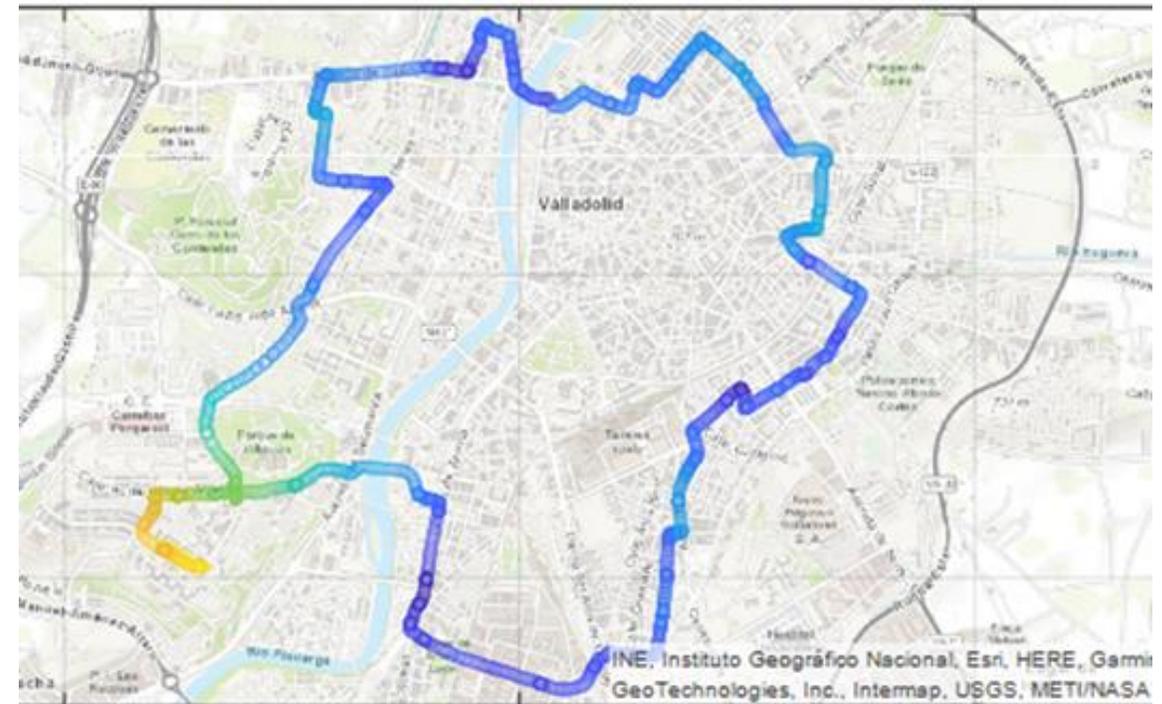
*Transfer of well-tested solution of Brake Dust Particle Filter from
passenger car to bus/commercial vehicles*



BRAKE EMISSIONS OF A CITY BUS?

- No general driving/braking cycle
- Depends on
 - city geography,
 - routes,
 - utilization,
 - ...

A potential bus line for measuring brake events of a city bus in our partner city Valladolid, Spain.

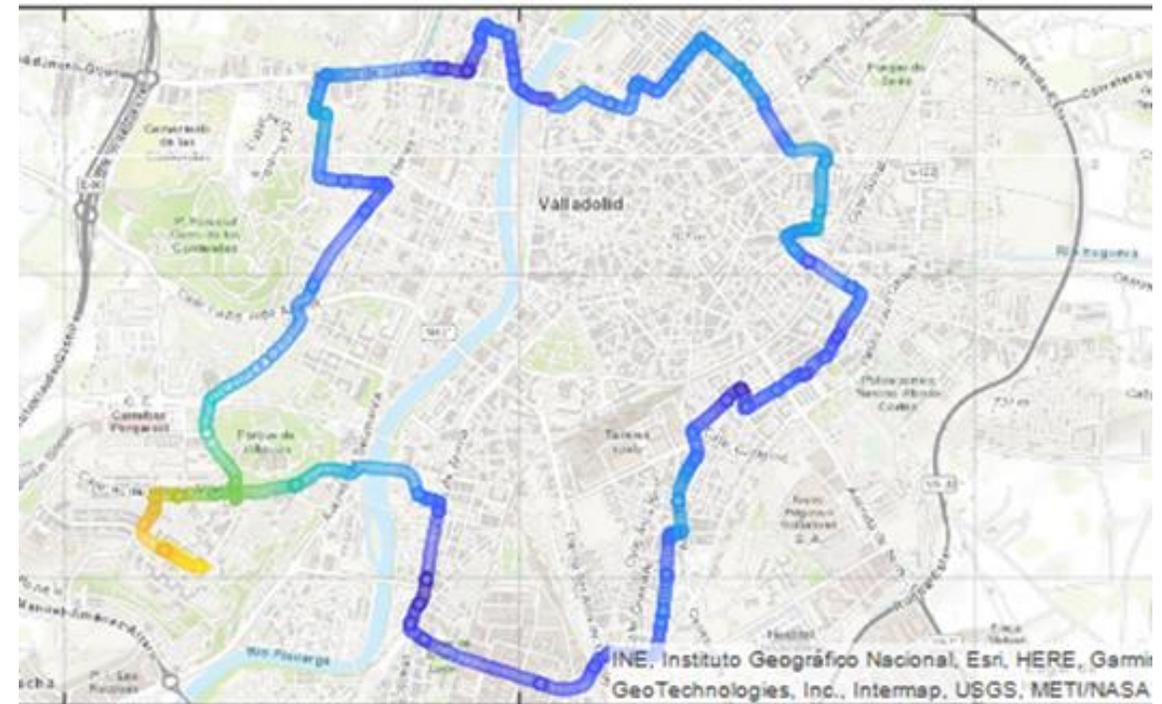


BRAKE EMISSIONS OF A CITY BUS?

AeroSolfd:

- Develops a method to obtain a **city-specific brake pattern**
- Runs measurements at partner cities
- City specific, but short brake cycle will be derived as “fingerprint”
- Cycle will be used to measure brake emissions in the lab on dynamometer

A potential bus line for measuring brake events of a city bus in our partner city Valladolid, Spain.

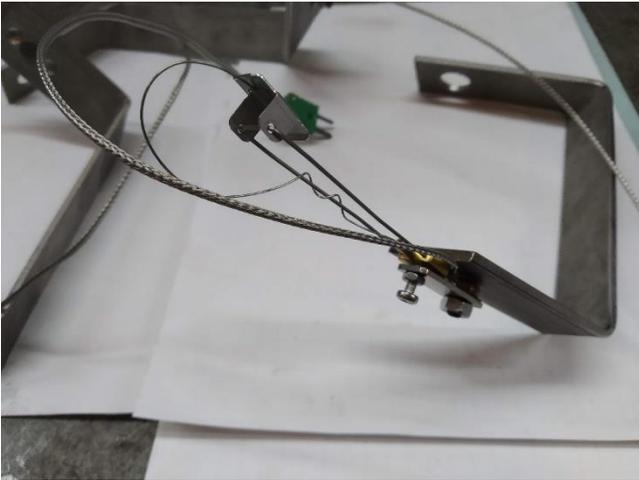


MEASURING BRAKE EVENTS

Gravimetric (disc, pads) before and after campaign

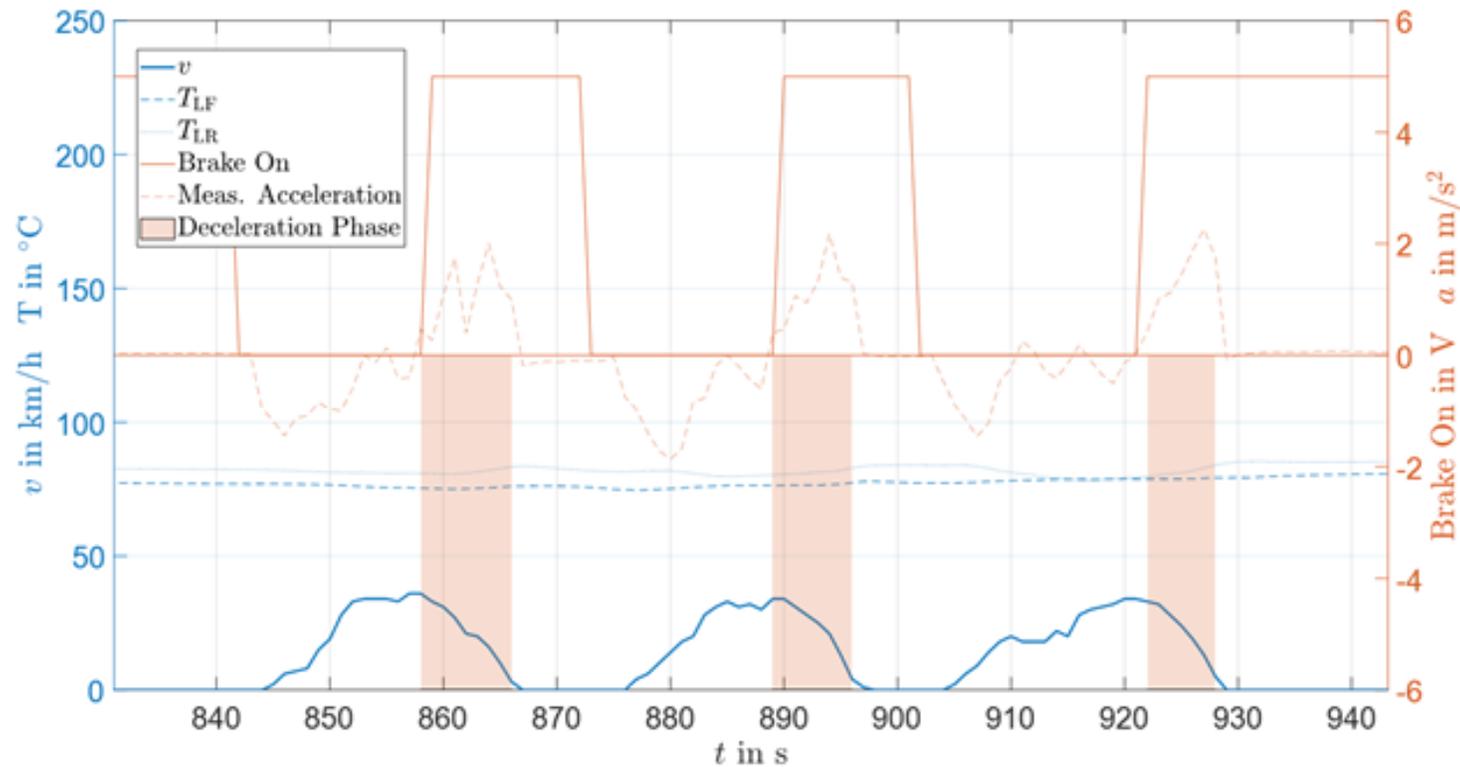


Temperature at brake Recording driving incl. brake events



PRELIMINARY RESULTS: EXAMPLE

- Brake Events recorded during measuring campaign at Valladolid, Spain



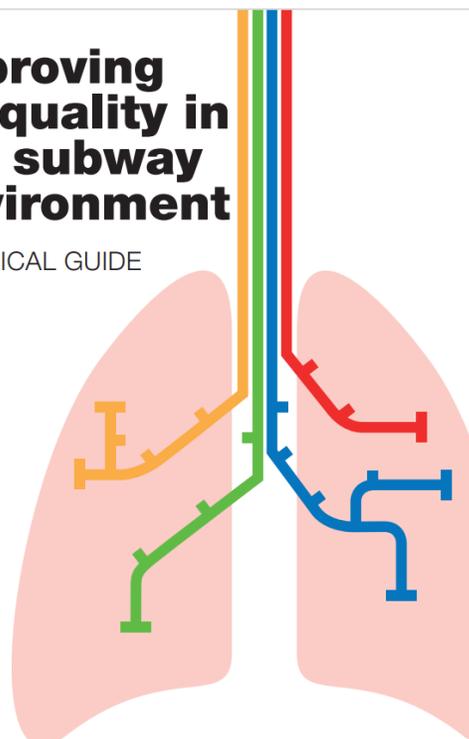
REDUCING POLLUTION IN (SEMI-)CLOSED ENVIRONMENTS

WHAT ABOUT URBAN TRANSPORT?

- Previous EU Project www.improve-life.eu (2014 – 2018)

Improving air quality in the subway environment

TECHNICAL GUIDE



Many subway stations have ambient levels of $PM_{2.5}$ higher than the legislated limits demanded for outdoor air

Platform and train air purifiers have the potential for improving subway air quality but they are still in R&D phase

Edited by Teresa Moreno

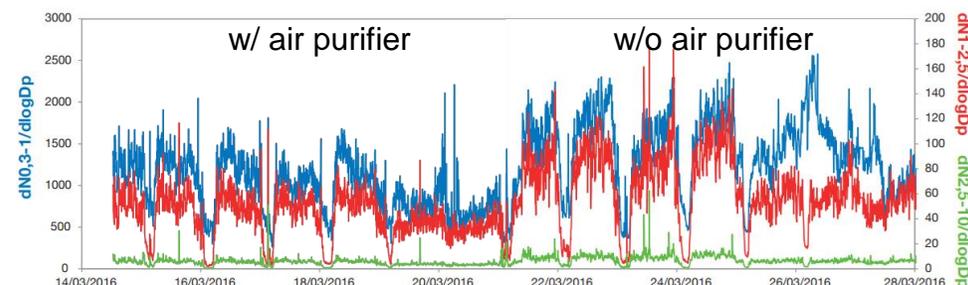


Figure 3. Time series of particle number concentrations at Tarragona subway station, with purifier adjacent to measuring equipment. Note the reduction in all three PM size ranges (grey area with purifier on).

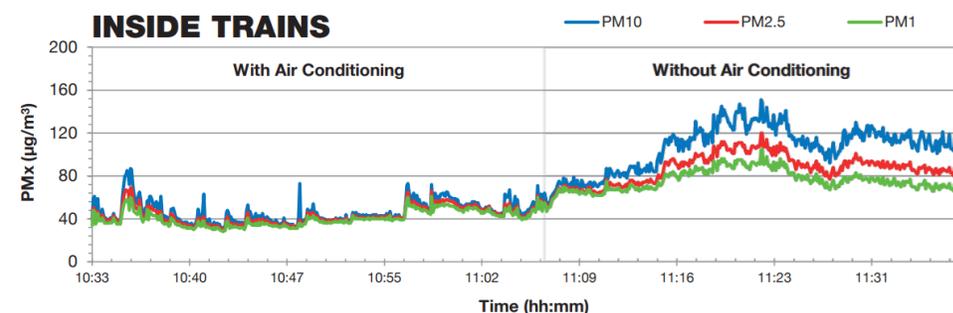


Figure 4. PM concentrations measured inside a train during a return trip with and without (grey) air conditioning on (adapted from Martins et al., 2015a).

INNOVATIVE STATIONARY AIR FILTER

- Transfer of Filtration Solutions – Indoor Air Purifiers for Metro Stations



NEXT: EXPOSURE MEASUREMENTS

Gravimetric data:

- PM2.5 filters for total daily concentration ($\mu\text{g}/\text{m}^3$) and
- Chemical composition. (High-volume sampler)

Automatic data:

registering data continuously for

- PM10, PM4, PM2.5, PM1
- PN
- CO2 and T-RH

Defining equipment based on experience gained in <http://www.improve-life.eu/>



SUMMARY & OUTLOOK

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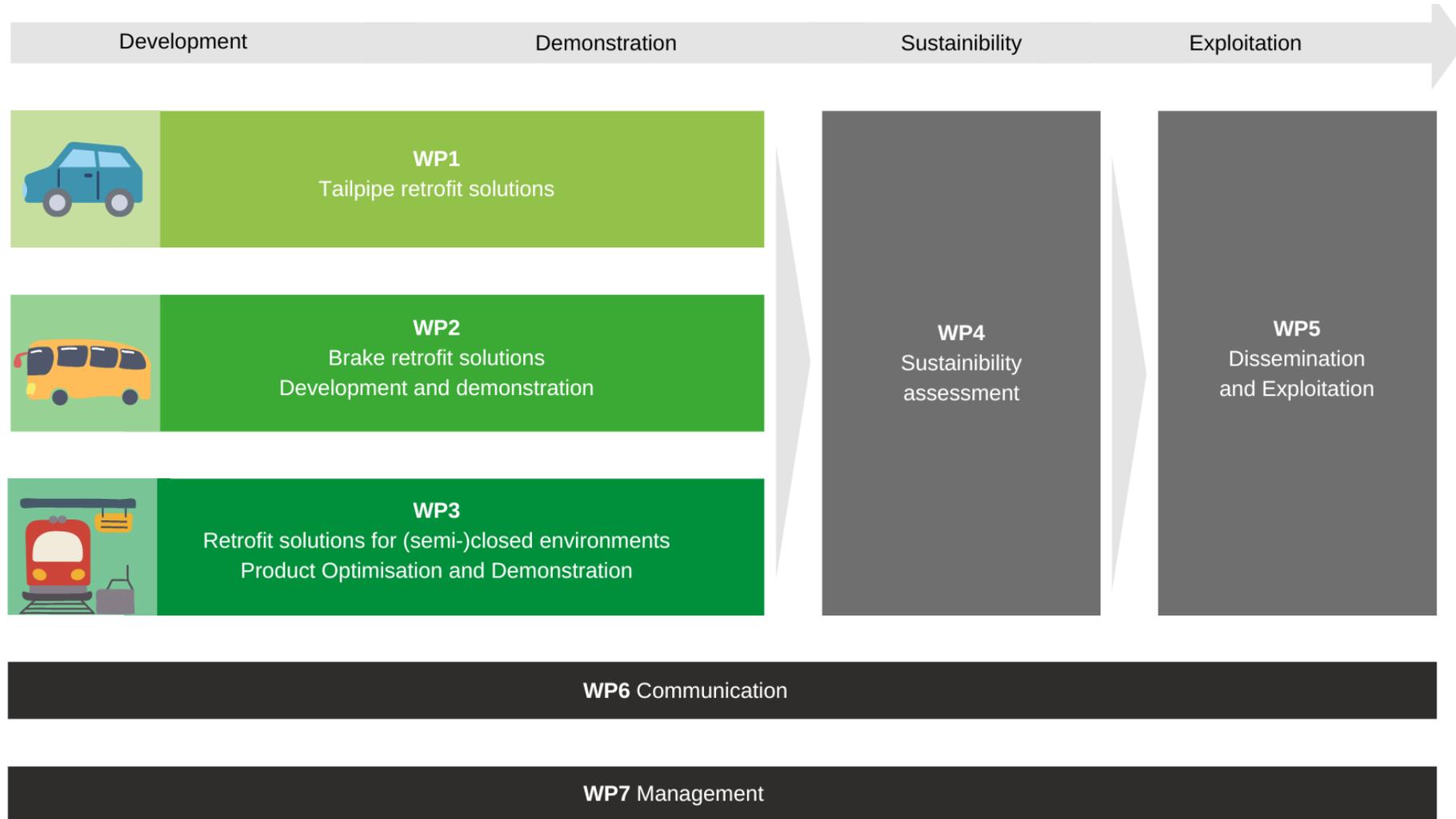
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Filtration DeVICES

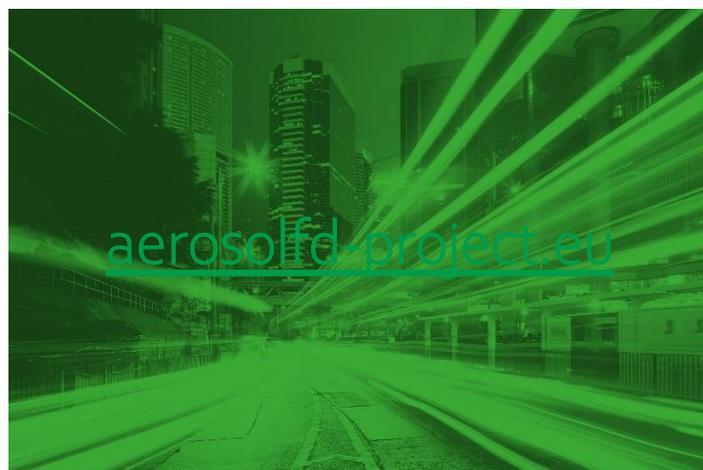


WORK PACKAGES



THANK YOU FOR YOUR ATTENTION

Detailed information on website
(Blogs, newsletter, upcoming events,...)



Let's stay
connected!



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STAYING ON TRACK

- Project updates, AeroSolfd-related events & more on our social media channels



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