iSCAPE Living Labs: Improving air quality in European cities

What is iSCAPE?

Research and innovation action for improving air quality in European cities

Increasing outdoor air pollution in cities is one of the major challenges of the 21st century, leading to serious consequences in terms of human health and a variety of environmental negative impacts on the planet. iSCAPE is a three-year research and innovation project, funded under the European Union's H2020 programme, working on integrated strategies for air pollution control in European cities that is grounded on evidence-based analysis. The iSCAPE project aims at reducing urban air pollution and negative impacts of climate change by leveraging sustainable passive control systems, behavioural change initiatives and the Living Lab approach.

Web sites for further information:

www.iscapeproject.eu/

http://livinglabs.iscapeproject.eu/

Date: May 2018

Remarks:

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iSCAPE Living Labs

The **iSCAPE Living Labs** connect a great variety of stakeholders, facilitate collaboration and sharing of multidisciplinary knowledge and experience to advance air pollution remediation strategies and solutions. This includes the engagement of citizens that is fundamental in Living Lab activities to create value and increase the public awareness of air pollution control.

iSCAPE LIVING LABS: THREE KEY PRINCIPLES

- Start with an open question rather than a defined solution.
- Be adaptable and iterative in your approach.
- Ensure the needs and behaviours of the user are considered at every stage of the design process.
- Think about how to actively involve citizens – from education and co-creation to testing and feedback.

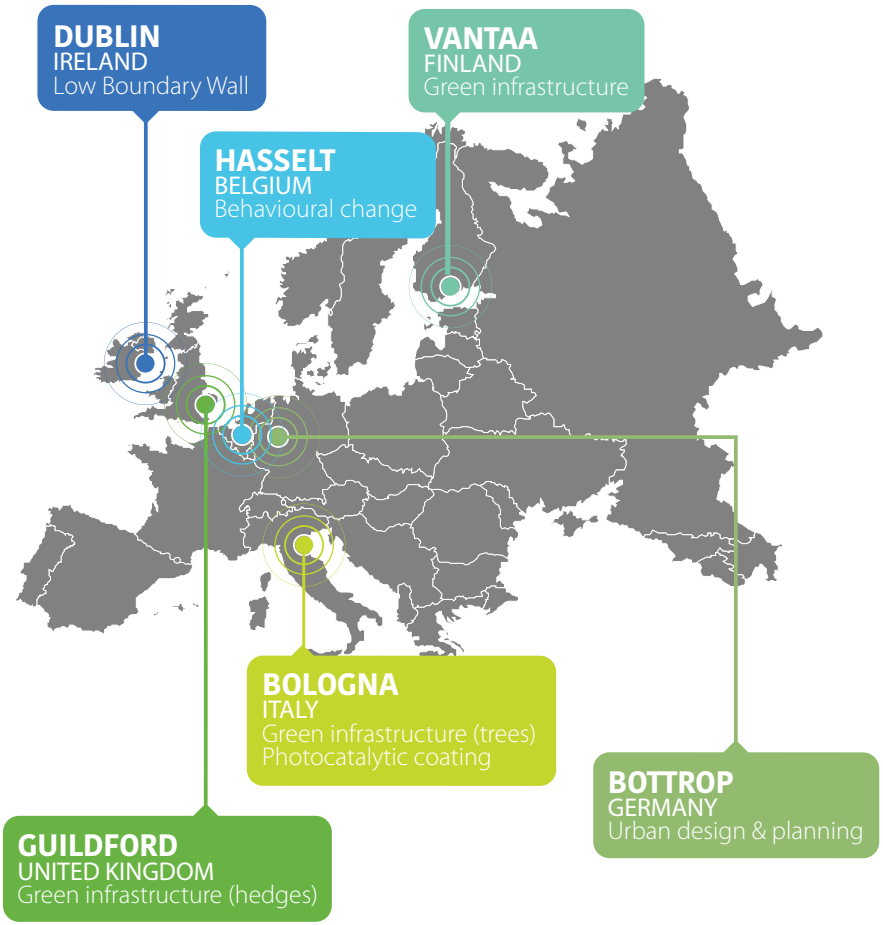
- Be open to adopting and building on the ideas of external organisations throughout the innovation process.
- Focus on good communication and learning from others - make sure you use the expertise of those around you.
- Have a central space to share ideas, learnings or cautionary tales.
- Be prepared to balance and address competing perspectives.

- Each Living Lab should experiment with one or more intervention intended to tackle issues around air quality and climate change.
- Each Living Lab should be situated in a real life urban context and engage citizens with the intervention.
- Be experimental – Living Labs provide places where things can be tried and tested and reworked – a safe space to make mistakes and learn from them.
- Think about how to blend a variety of research methods in innovative ways.
- Think about how to track the impact of the Living Lab – how can you measure its success? How can you iteratively adjust the intervention to experiment again?

iSCAPE Living Labs activities

iSCAPE Living Labs assess the effectiveness of a number of passive control systems (green infrastructure, low boundary walls, photocatalytic coating, urban design) and behavioural change to reduce urban air pollution and address the negative impacts of climate change. In addition they provide citizens with Smart Citizens sensor kits to measure air pollution locally. These interventions are further advanced by directly involving citizens and facilitating collaboration and knowledge sharing between a great variety of stakeholders.

Living Labs have been set up in six European cities: *Bologna, Bottrop, Dublin, Guildford, Hasselt and Vantaa*, with each city assessing and tackling air pollution from a different perspective.



Living Lab

Bologna

Coordinator
Prof. Silvana Di Sabatino (Bologna)
Prof. Beatrice Pulvirenti (Lazzaretto)
UNIVERSITY OF BOLOGNA, ITALY

City background

Bologna is the seventh most populated and one of the wealthiest cities in Italy. It is located in the Po Valley in Northern Italy, which is recognized as a hot-spot in terms of air quality and climate change. Bologna is an important transportation crossroad for both roads and trains. The main challenges concerning air pollution are first of all linked to its location inside the Po Valley, often characterized by low ventilation and stagnation conditions especially during wintertime; secondly, and not less important, the city is mostly designed for cars, and infrastructural innovation is quite challenging in an historical city. Moreover, citizens' perception on air quality issues and of their solution is often quite low and confused; however, citizens are often keen to interact and curious on these themes.

Living Lab activities

- **Objectives:** Bologna Living Lab aims to raise awareness about air quality and impact of passive control systems to reduce air pollution. It is involving local actors around two interventions: measuring campaigns in two street canyons (with and without trees) in trafficked roads in the city center, and one intervention with photocatalytic coating at Lazzaretto.
- **Actors:** main stakeholders involved in the local pilots are the University of Bologna (Department of Physics, Department of Industrial Engineering, Department of Civil, Chemical, Environmental and Materials Engineering), the Regional Agency for Prevention, Environment and Energy of Emilia-Romagna (ARPAE), the City Hall, the Bologna Urban Center and the Green Office.
- **Used Passive Control Systems**: Photocatalytic coating, Green infrastructure (trees)

"I don't know how people will live in the next 30 years in the city of Bologna, but I certainly know that if we do not modify our lifestyle our children will not be able to go out to play at the park"

- Living Lab Participant

How to get involved

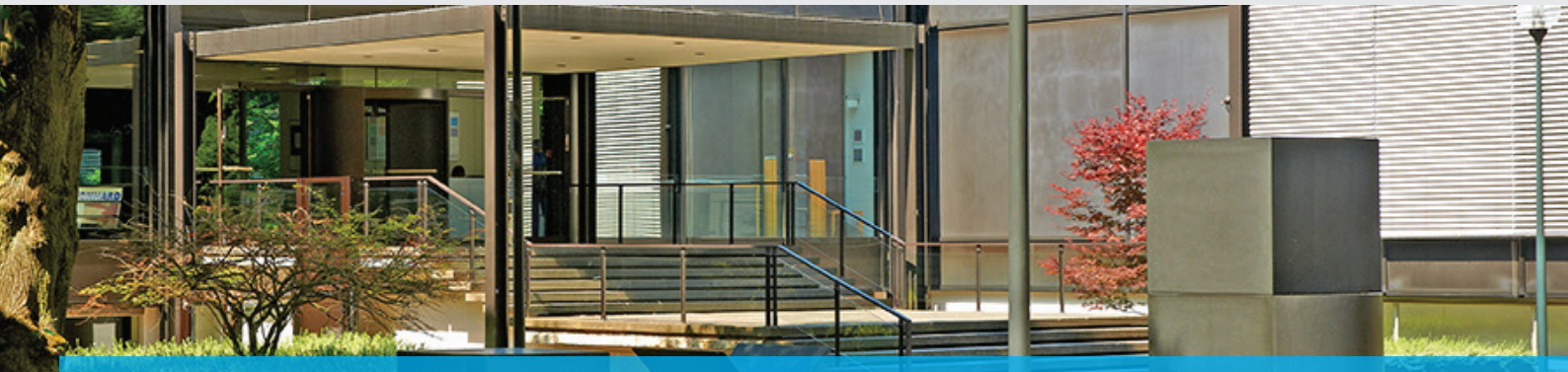
For more information see **https://livinglabs.iscapeproject.eu/bologna/** or contact the local Living Lab coordinators, or their staff, by email:

Prof. Silvana Di Sabatino: Silvana.disabatino@unibo.it

Prof. Beatrice Pulvirenti: Beatrice.pulvirenti@unibo.it

Dr Erika Brattich: Erika.brattich@unibo.it

Mr Francesco Barbano: Francesco.barbano3@unibo.it



Living Lab

Bottrop

Coordinator
Prof. Dr.-Ing. Stefan Greiving
TECHNICAL UNIVERSITY OF DORTMUND, GERMANY

City background

Bottrop is in North Rhine-Westphalia in west central Germany, on the Rhine-Herne Canal, and it is located at the heart of the wider Ruhr industrial area. Therefore the main challenge is that the city has an industrial heritage and the coking plant is still a source of pollution. Moreover the area is densely populated with people and cars. Citizens' perception of the sensitive situation of the local air pollution is low.

Living Lab activities

- **Objectives:** Bottrop Living Lab aims to involve citizens and local stakeholders in city greening initiatives. The objective is to improve air quality, as well as enhance wellbeing of local citizens. This will happen by implementing the Wandering Trees intervention, having citizens experimenting first hand changes in the local environment produced by the presence of trees in their neighbourhood. Another objective is to make citizens aware of the theme green urban infrastructure through wandering trees.

- **Actors:** main stakeholders involved in the local pilot are the Technical University of Dortmund, the City Administration, the Urban gardeners' Association and the local residents.

- **Used Passive Control System**: Urban design & planning

"The idea of having trees wandering around in the city is great. It is an innovative and creative way to get people involved and sensitized."

– Representative of the City of Bottrop

"I'm happy about the Wandering Trees in my neighbourhood. With more green, everything is better!"

– Citizen of the City of Bottrop

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How to get involved

Interactive workshops and events, Social Media and local press.

Anyone who wants to join and any form of engagement are welcome: whether for providing ideas or as an active support.

For more information see **https://livinglabs.iscapeproject.eu/bottrop/** or contact **iscape@tu-dortmund.de**

Living Lab

Dublin

Coordinator
Dr. Francesco Pilla
UNIVERSITY COLLEGE DUBLIN, IRELAND

City background

Capital and largest city of Ireland, Dublin has more green spaces per square kilometre than any other European capital city. The city's sheltered location on the east coast makes it the driest place in Ireland, receiving only about half the rainfall of the west coast. This represents a challenge on its own with regard to air pollution control, deepened by the fact that the city is designed for cars and the historical setting does not facilitate renovation.

Living Lab activities

- **Objectives:** Dublin Living Lab aims to enhance the dialogue between different stakeholders and ensures that people's voices are heard to generate solutions that address such wicked problems as air quality and climate change. The local measuring and interventions are focused on low boundary walls, that are the object of a long-term study as well as of citizens' engagement and hands-on activities. The use of Smart Citizens sensor kits will allow participants to directly assess benefits and impacts of the different infrastructures in the city.

- **Actors:** the main stakeholders involved are the University College Dublin, the Dublin City Council, the Department of Housing, Planning, Community and Local Government, the Trinity College Dublin, the Irish Environmental Protection Agency, the Irish National Meteorological Service and the local residents.

- **Used Passive Control System**: Low Boundary Wall

"I was delighted to host the Hack the Air event at the Science Gallery Dublin on March 14, 2018. It was absolutely brilliant for us to see all of the creative ideas and inspirational prototypes built by the participants for such a complex problem as air pollution. Events like this stimulate conversations between citizens, scientists, and education professionals in order to encourage a shared responsibility for science."

- Gillian Roddie, Interim Education and Learning Manager at the Science Gallery Dublin

"Dublin City Council values the air we breathe. I feel that a problem that affects everyone around the globe requires broad collaboration between city stakeholders, researchers and citizens. We are eager to participate in the development of new solutions that reduce pedestrian exposure to air pollution as part of this project."

- Brian McManus, Head of Traffic Noise and Air Quality, Dublin City Council

How to get involved

Join us on one of our upcoming events or activities. Meet experienced researchers, educators, business representatives, and committed professionals to learn more about air pollution and work together with your peers to design new solutions aimed at reducing air pollution.

For more information please visit our website **https://livinglabs.iscapeproject.eu/dublin/**
or contact **Dr Francesco Pilla** at **francesco.pilla@ucd.ie**

Living Lab

Guildford

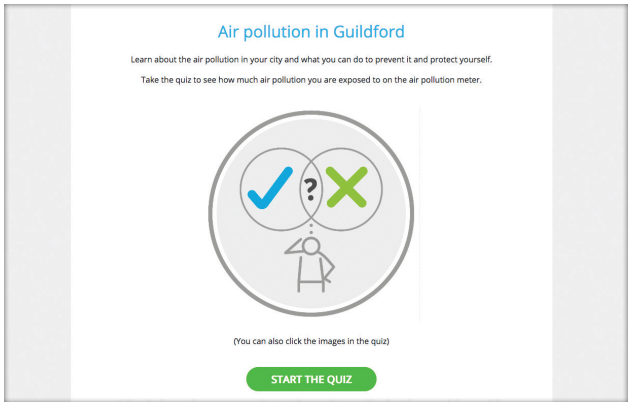
Coordinator
Prof. Prashant Kumar
UNIVERSITY OF SURREY, UK

City background

Guildford is a large town in Surrey, UK, and it officially forms the southwestern tip of the Greater London Area. In terms of pollution its main challenge is represented by the closeness to two major airports, Heathrow and Gatwick. It is also highly trafficked and densely populated. Citizens' perception on the issue of air pollution is often confused, especially in relation to the impacts on health.

Living Lab activities

- **Objectives:** the local activities aim to raise citizens' awareness about air quality and impact of green infrastructure to reduce air pollution and improve health and well-being. Key steps to achieve the goal will be measurement campaigns on sselected local areas and the development of an interactive display for citizens to visualize information gathered by sensors in an engaging and playful way.
- **Actors:** the main stakeholders involved are the University of Surrey and local councils and citizens.
- **Used Passive Control System**: Green infrastructure (hedges)



How to get involved

Residents of Guildford can get actively involved in planned activities which include:

- Citizen engagement activities using Smart Citizens sensor kits which are being organised with the help of Guildford borough council;
- Three or more workshops for the dissemination of research findings being set up with the help of Guildford borough council.

For more information see **https://livinglabs.iscapeproject.eu/guildford/**
or contact **Prof. Prashant Kumar** at **p.kumar@surrey.ac.uk**

Living Lab

Hasselt

Coordinator
Dr. Muhammad Adnan
Transportation Research Institute (IMOB)
HASSELT UNIVERSITY, BELGIUM

City background

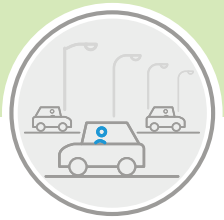
Hasselt is the capital of the province of Limburg, in the Flemish region. Its historical centre is mostly car free, but the city is at the junction of several important traffic arteries, which makes cars' pollution the main local challenge. Despite a low perception of the issue among citizens, the local administration together with academia has taken an initiative to tackle this problem, and raising awareness is among the core goals at the local policy level.

Living Lab activities

- **Objectives:** Hasselt Living Lab aims to encourage pro-environmental behaviour among citizens by designing informational-based behavioural interventions. In particular, it aims to impact travel behaviour by recording individual activity travel patterns using a smartphone application. A Behavioural Intervention Tool i.e. a Customized Information Package can provide users their mobility information cross-checked with air pollution data, to encourage a change towards more sustainable habits and choices.

- **Actors:** Main stakeholders involved are local citizens, the Transportation Research Institute (IMOB) of the Hasselt University and the Stad Hasselt.

- **Used Passive Control System**: Behavioural Change



Responses in the feedback survey regarding effectiveness of the intervention taken at the end of the Pilot Study in Hasselt. Some of the motivational and encouraging responses are as follows:

" There are still more possibilities/alternatives when moving than seems, at first sight, to act in a more pro-environmental way."

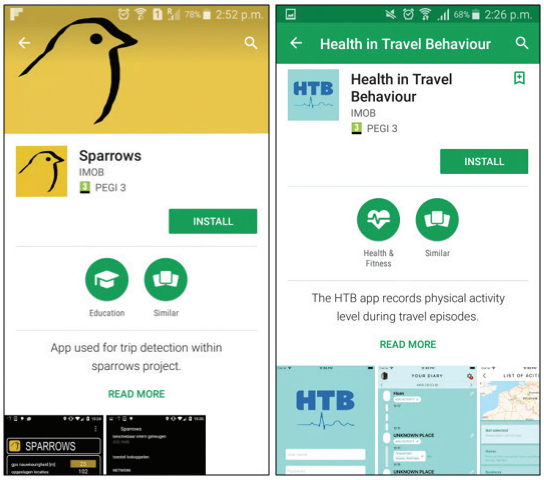
- Living Lab participant

"Small changes in my daily pattern can have a big impact on the battle against the warming of the beautiful blue planet! Provided that a larger number of cohabitants want to participate. Every little effort counts."

- Living Lab participant

"Controlling traffic and air quality are major challenges for a growing city such as Hasselt, as these two components have a huge impact on our living conditions and quality. The iSCAPE-study was conducted taking into account both factors, which is a good approach. It gives us, the city of Hasselt, the opportunity to develop a suitable policy based on these results. I am also pleased to hear that there remains considerable scope for behavioural changes. That is what the city aims for."

- Alderman for Transportation Habib El Ouakili



How to get involved

For more information see **https://livinglabs.iscapeproject.eu/hasselt/** or if interested in getting involved contact us on **iscape@uhasselt.be**. We shall inform and consider you for upcoming events organized by the Hasselt Living Lab.

Living Lab

Vantaa

Coordinator
Achim Drebs
FINNISH METEOROLOGICAL INSTITUTE, FINLAND

City background

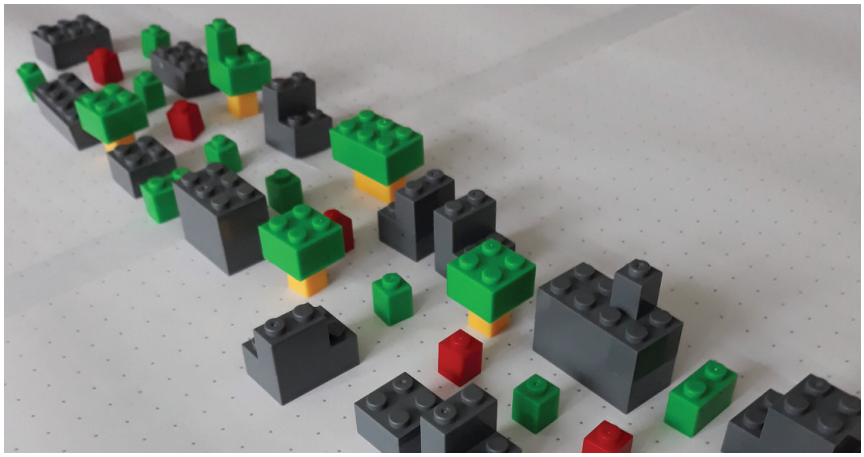
Vantaa is part of the inner core of the Finnish Capital Region along with Helsinki, Espoo, and Kauniainen. Helsinki Airport, the largest in Finland, is located in Vantaa. The city also serves as the transportation hub of the Helsinki metropolitan area, therefore pressed by the double challenge of the airport driven pollution and of the highly trafficked roads. The local administration keeps air quality among its priorities while implementing local urban plans, also working to improve citizens' perception.

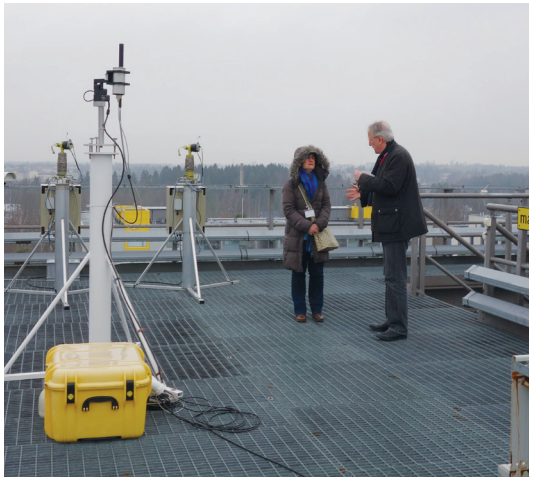
Living Lab activities:

- **Objectives:** Vantaa Living Lab aims to raise awareness of citizens and city stakeholders about air quality and impact of green infrastructure to reduce air pollution and provide socio-economic benefits.
- **Actors:** main involved stakeholders are the Finnish Meteorological Institute (FMI), the Vantaa city, the Heureka Science Centre, the Climate Street Project and the Air Quality Monitoring Service. The measurements focus on two sites in the city, monitoring local weather and studying green infrastructure simulation. Local citizens are engaged though activities and awareness raising events.
- **Used Passive Control System**: Green infrastructure

"As we share the objective in citizen engagement and making people to think and be more aware of the environment, the support from FMI and iSCAPE has been of high importance."

- Heureka Science Centre





How to get involved

For more information see **https://livinglabs.iscapeproject.eu/vantaa/**
or to get involved contact the **Finnish Meteorological Institute**: **Achim Drebs**, **achim.drebs@fmi.fi**
Antti Mäkelä, **antti.makela@fmi.fi** or Vantaa city: **Leena Maidell-Münster, leena.maidell@vantaa.fi**

The iSCAPE Living Labs platform

The Living Labs platform is a virtual extension of the Living Labs and a collaborative platform enabling conversations around air pollution in Europe. It will gather the results of the tests from the six Living Labs and present opportunities for collaboration and concrete solutions that we can all apply to improve the air quality of our cities.

The Living Labs platform contains a variety of invaluable resources (from thought starters, to illustrations and toolkits) to enable stakeholder engagement as well as an interactive air quality map connected to the Smart Citizens sensors deployed during iSCAPE and interactive tutorials on how to set up and use the sensors and toolkits for practitioners.

https://livinglabs.iscapeproject.eu

iSCAPE project partners

The iSCAPE team represents a vast range of disciplines, including engineering, climatology, physics, urban planning, sociology, cultural anthropology, human-centered design, hardware and software development, economy and policy-making.

iSCAPE partners are:

- University College Dublin
- University of Bologna
- University of Surrey
- Finnish Meteorological Institute
- Hasselt University
- Technical University Dortmund
- JRC - Joint Research Centre - European Commission - Institute for Environment & Sustainability
- Institute for Advanced Architecture of Catalonia - FabLab Barcelona
- T6 Ecosystems S.r.l.
- Nanoair Solutions S.r.l.
- Future Cities Catapult Ltd.
- Dublin City Council
- Regional Agency for Prevention, Environment and Energy of Emilia-Romagna
- European Network of Living Labs
- Trinity College Dublin

iSCAPE

IMPROVING THE SMART CONTROL OF AIR POLLUTION IN EUROPE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 689954.

Find out more about iSCAPE

If you are interested in getting updates on iSCAPE and participating in upcoming events, please visit our website or follow us on social media. You can also sign up for our regular newsletter or contact the project coordinator:

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