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The Urban Lab of Europe !

# The CitiCAP (citizens' cap and trade co-created) Project Journal N°1

*Project led by the City of Lahti, Finland*



**URBAN  
MOBILITY**



# The CitiCAP project

The **CitiCAP** project will experiment a Personal Carbon Trading (PCT) scheme to promote sustainable and low-carbon urban mobility by promoting and rewarding behavioral changes.

The PCT scheme will be co-designed in the framework of the Sustainable Urban Mobility Plan and through a participatory and user-led process. i Different experimental PCT models will be compared, in which citizens will be able to monitor their emission and budget their carbon use via an open mobility data platform. The urban mobility data gathered through the platform will be relevant for public authorities, as well as to foster sustainable mobility services and business opportunities. In parallel, a package of incentives will be put in place to encourage the use of the PCT scheme, and carbon-neutral bicycle highway lanes investments will be carried out in order to support low-carbon choices of transport.

## **Partnership:**

**City of Lahti; 1 Business support organisation:** Lahti Region Development LADEC Ltd; **2 Higher Education and Research Institutes:** Lappeenranta University of Technology LUT; Lahti University of Applied Sciences LUAS; **4 private SMEs:** MOPRIM Ltd; Coreorient Ltd; Infotripla Ltd; Mattersoft Ltd.

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# 1. Executive Summary



This is the first of a series of journals following the CitiCAP (citizens' cap and trade co-created) project implementation process. It will briefly outline the EU, national and local policy and the three key challenges associated with the project. The third part will look at progress made to date and how the project is overcoming challenges of implementation. This contribution is setting the scene for the implementation of the pilot and subsequent journals will pay further attention to the advancements of the implementation process.

The goals of the CitiCAP project are to promote sustainable mobility, collect and make available digital data on mobility, and develop new transport services for citizens. The CitiCAP project will experiment with a Personal Carbon Trading (PCT) scheme for mobility as part of the

Lahti region's transport policy and build a main cycle route based on smart solutions (Lahti city center – Apilakatu street).

In practice, PCT means that citizens will benefit from reducing their own emissions from mobility. They could receive, for example, various benefits in the traffic environment, as well as incentives for service use. For instance, citizens whose mobility emissions remain below their personal quota levels could be offered cheaper public transport or bicycle maintenance services via an online marketplace. The aim is to also get employers involved in the CitiCAP project, as they can reward their employees for taking sustainable transport.

The project seeks to build a new model for the Sustainable Urban Mobility Planning (SUMP) process by integrating the traffic and spatial master planning processes into the same co-

designed entity. Strategic investments in cycling will be included to increase its impacts and will include a smart main cycle route as indicated.

One of the basic requirements of CitiCAP is to collect comprehensive data on people's mobility choices. A light and replicable mobility data platform will be created to implement PCT to serve as a planning tool for City mobility planners as well as an open access mobility data source for innovators.

**Partnership:**

City of Lahti; 1 Business support organisation: Lahti Region Development LADEC Ltd; 2 Higher Education and Research Institutes: Lappeenranta University of Technology LUT; Lahti University of Applied Sciences LUAS; and SMEs: Moprim, Future Dialog, Good Sign, Infotripla and Mattersoft.

# 2. Policy Context

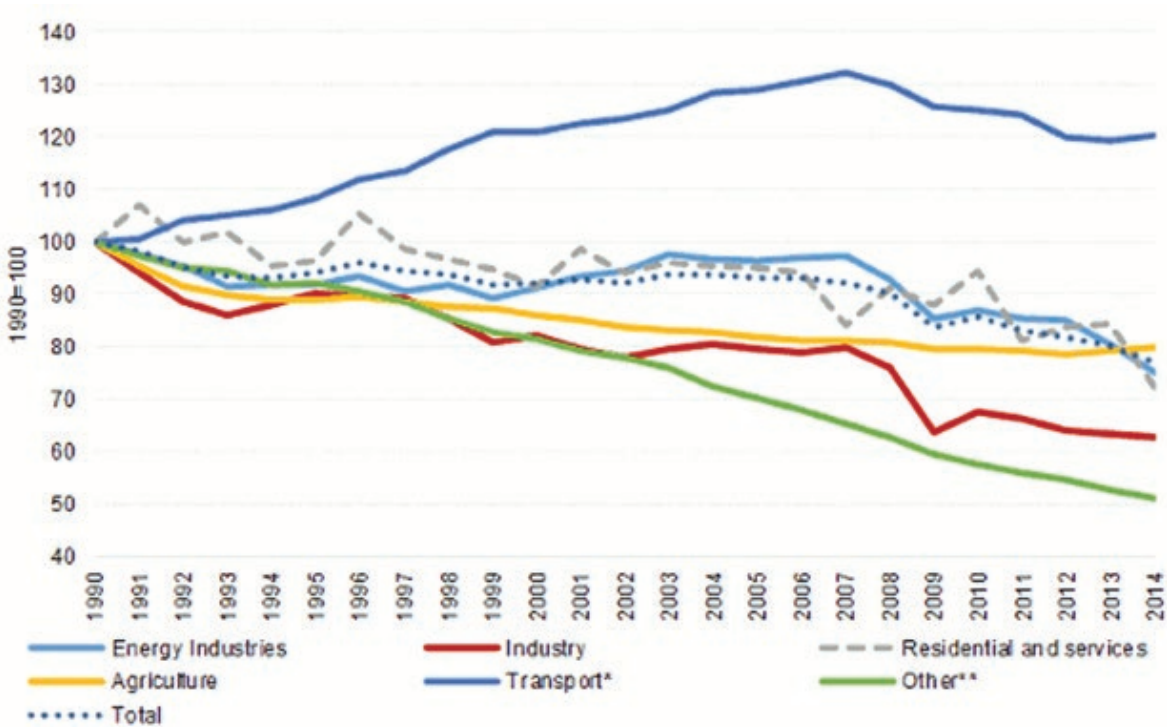
The Urban Agenda for the EU is a new working method to ensure maximum utilisation of the growth potential of cities and to successfully tackle social challenges. One of its central aims is to have sustainable and efficient urban mobility. The focus will be on: public transport, soft mobility (walking, cycling, and public space) and accessibility. The aim is to provide better public

services to citizens and create business services enabled through digitalisation and innovation. In doing so, significant progress can be made to achieving the Paris Climate Agreement and the 2030 Agenda on Sustainable Development. At the same time, the EU faces significant challenges when it comes to its transport and climate performance.

## 2.1 EU Policy Context

Transport represents almost a quarter of Europe’s greenhouse gas emissions and is the main cause of air pollution in cities. The transport sector has not seen the same gradual decline in emissions as other sectors: emissions only started to decrease

in 2007 and still remain higher than in 1990 (see graph below). It is the only sector where emissions are now on the rise and is becoming a major obstacle to the EU reaching the objectives of the Paris Climate Agreement.



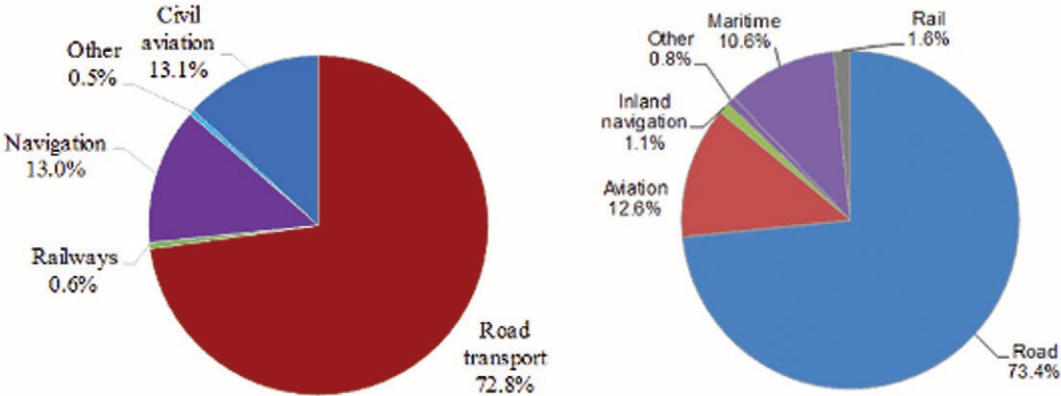
Source: EEA.

Note:

\* Transport includes international aviation but excludes international maritime.

Others include fugitive emissions from fuels, waste management and indirect CO<sub>2</sub> emissions.

Within the sector, road transport is by far the biggest emitter accounting for more than 70% of all energy demand and greenhouse gas (GHG) emissions from transport in 2014, up to which around half originate in urban areas.



Source: European Commission. Greenhouse gas emissions by mode in 2014 and share of energy demand by mode in 2014 (%)

With the global shift towards a low-carbon, circular economy already underway, the Commission’s low-emission mobility strategy, adopted in July 2016, aims that greenhouse gas emissions from transport will need to be at least 60% lower than in 1990 and be firmly on the path towards zero by:

- Increasing the efficiency of the transport system by making the most of digital technologies, smart pricing and further encouraging the shift to lower emission transport modes;
- Speeding up the deployment of low-emission alternative energy for transport, such as advanced biofuels, electricity, hydrogen and renewable synthetic fuels and removing obstacles to the electrification of transport; and

- Moving towards zero-emission vehicles. While further improvements to the internal combustion engine will be needed, Europe needs to accelerate the transition towards low- and zero-emission vehicles.

Cities and local authorities will play a crucial role in delivering this strategy. They are already implementing incentives for low-emission alternative energies and vehicles, encouraging active travel (cycling and walking), public transport and car-sharing/pooling schemes to reduce congestion and pollution. In this context, the CitiCAP project can play a crucial role in advancing the EU’s objectives to decarbonise the transport sector, notably as the Commission consults on its 2050 strategy for long-term EU GHG reductions that will make a major contribution to the Paris Climate Agreement.

## 2.2 National Policy Context

Finland is a northern European country where innovative technologies and digital solutions are actively pioneered. With just 5.5 million

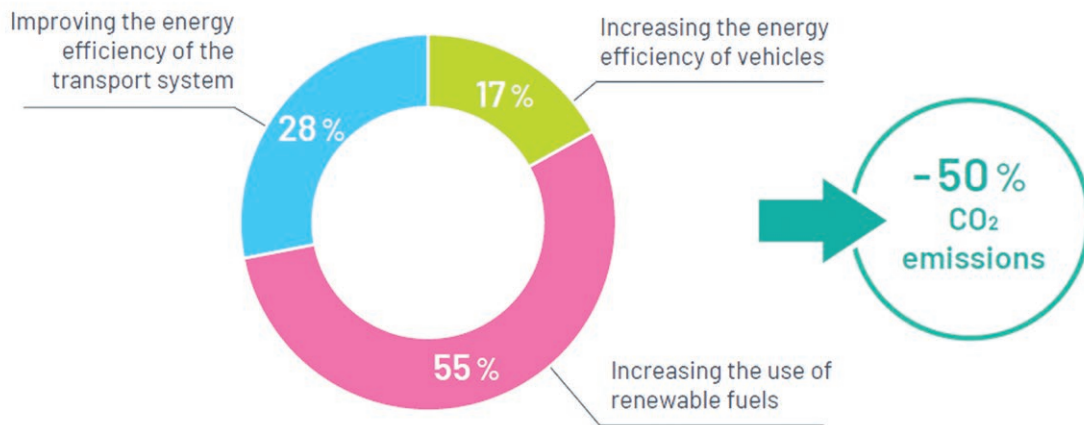
inhabitants spread across a large and mainly sparsely populated country, Finland is often a challenging environment for public transport. In

rural areas, and especially in northern regions, distances from homes to services or workplaces are often very long. Contrastingly, in the most densely populated urban areas, where most Finns live today, increasing trends in cycling and public transport are clearly evident.

There is a growing need to increase the share of sustainable transport modes. In 2016, the Finnish

Government published its National Energy and Climate Strategy for 2030. This report sets a target to reduce the transport sector GHG emissions by 50% by 2030. Both technological advances and rapid changes in modal shares will need to reach this target. The strategy also includes the goal of increasing walking and cycling by 30%.

*The key ways to achieve the goals set in Finland's National Energy and Climate Strategy for 2030.*



Source: Motiva Oy; Graphic: EPOMM

Finland is well-known for its active start-up community. Many companies are presently working around the theme of Mobility as a Service (MaaS), seeking new ways to connect passengers and increase the available transport capacity. Many new pilot projects and services have been launched during 2018. Again, it is for this reason

the CitiCAP project can play an essential role in advancing the national energy and climate strategy, especially since the UIA has and only supports initiatives that are transferable, in that they are replicable in other cities throughout Europe and nationally.

## 2.3 Lahti Policy Context

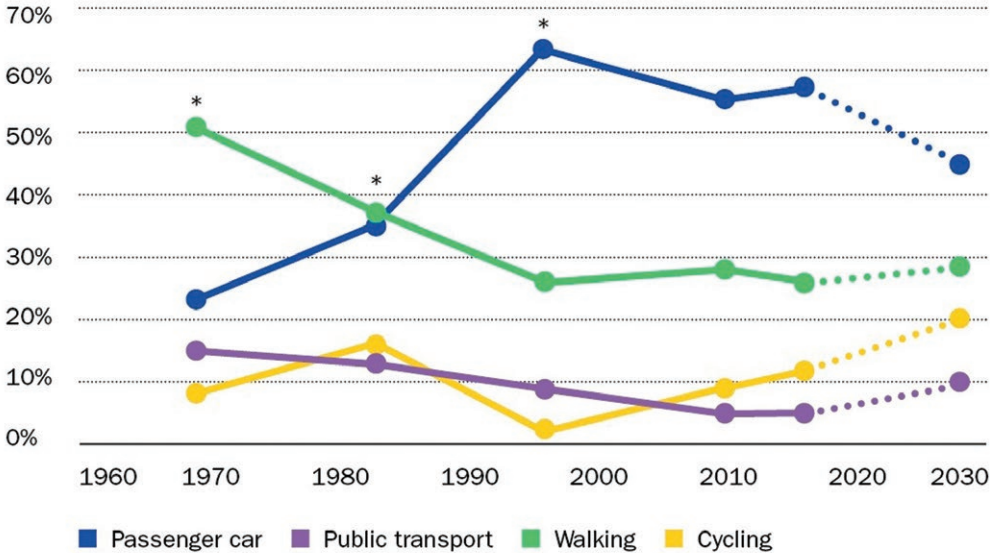
Citizens of Lahti have an average carbon footprint of 7,2 tCO<sub>2</sub> eqv (around the EU average), a third of which is from mobility. The city has ambitions for a stretch CO<sub>2</sub> reduction target of 70% by 2030, compared to 1990 levels. **Lahti has also set itself**

**the goal to be carbon neutral by 2040.** This will naturally entail a special focus on sustainable urban mobility to stop the increase of traffic emissions. An emphasis will now be placed on integrating the SUMP into the City's spatial master



plan 2017-2020, which creates the analytic city-wide framework for cutting emissions from the transport sector, for instance by:

- improving the bicycle infrastructure;
- finding smarter and low-carbon solutions for public transportation in a city with 120,000 residents; and
- increasing the pedestrian-friendly spaces in the urban cores of Lahti.



Source: City of Lahti, goals for sustainable transport

A good road network was developed for cars, making it a very convenient transport mode. Major transport routes almost cut through the city centre. Also, the cold climate, hilly landscape and rather sparse population favour motorization, with a current modal split at around 61%. Public transport constitutes 5% (around 90% of the City’s buses are low emission buses and belong to the cleanest EURO VI category), walking 26% and cycling 11% with the remaining other transport modes (2016 data). In 2015, around 85% of residents lived in a pedestrian/public transport zone (70% of all trips are taken within a 5km radius of the urban core). The objective is to double the market share of public transport and walking which is hoped to replace over

10% of the journeys currently undertaken by private vehicles.

Considerable changes in transport are needed to achieve Lahti’s goals. Condensed and mixed land use to reduce the need for transport, and the need to promote sustainable transport modes and last mile solutions will be key. Push and pull policies will be fundamental to this, such as changing attitudes, enhancing accessibility and use of the sustainable transport network but also securing commitment and leadership to the process. Furthermore, the monitoring and reporting of the effectiveness of such policies, essential to the SUMP process but also for the project, will be key. This highlights just some of the challenges that will be faced by CitiCAP.

## 3. CitiCAP Challenges

In small and medium-sized cities, problems related to car traffic, for example, are different from those encountered in larger cities. This means that new, positive incentives for sustainable mobility are needed and Lahti is well suited as a platform for experimenting with such positive incentives. In no particular order, this section of the report identifies some of the major challenges of the project. This is based on initial analysis by the City of Lahti.

The three main challenges to tackle are:

- How to **change the mobility attitude and behaviour of citizens** to promote the shift from private car to sustainable mobility?

- How **medium-size cities may develop their mobility environment**: increase the use of sustainable mobility modes, enhance the multimodality and decrease CO<sub>2</sub> emissions, while they cannot use all mass transit options that are available for larger cities?
- How the **ITS approach can be integrated into the sustainable urban mobility planning** and service provision?

### 3.1 Changing the mobility attitude and behaviour - Personal Carbon Trading (PCT)

In practice, PCT means that citizens will benefit from reducing their own emissions from mobility. They could receive, for example, various benefits in the traffic environment, as well as incentives for service use. This is the first city-wide pilot of PCT ever performed on mobility so that in itself is a challenge as there are no lessons to be learned.

The challenges surrounding PCT are multi-faceted. Beyond technical questions, there are barriers related to the economic feasibility of the scheme and issues around public acceptance. Research to date shows that some of the most significant obstacles fall into these broad categories. One of the biggest challenges relates to the political risk of such a scheme and the perceived extent by which governments should challenge personal

consumption. Perceptions of the scheme as over-restrictive or unnecessary would be difficult to overcome in some quarters of society and the idea that the individual must now bear the burden and not the state. There is also the risk that some quarters of society, notably low income households, women due to security concerns in using public transport or people with disabilities, may be unduly punished which would make it a politically sensitive policy to pursue. **Ensuring the fair distribution of emissions will therefore be essential.**

The challenge around the system and operation of the PCT scheme will also need to be taken into consideration. The system must be easy to use, understandable, resilient to fraud and able to

accurately cope with large amounts of data. At the same time, the technology does not appear to be a barrier but how to properly account emissions and the scheme's boundary of control do raise some issues.

The **public's involvement will be needed for both its effectiveness and acceptance**. This then raises the question as to how 'carbon capable' people are so that they can make informed judgements

in order to reduce their carbon footprint. It has been argued that a PCT should be mandatory but with the pilot phase aiming at engaging around 1% of the city population, there is a **risk that only the 'converted' with already low carbon footprints will want to engage**. It will be important that the pilot embraces a broad range of the population, both high and low polluters as well as high and low income households, so that real lessons can be learned so that it can be scaled up effectively.

## 3.2 ITS and sustainable urban mobility planning and services

The PCT will only work if it has a platform that can effectively and efficiently collect and process various personalised kinds of mobility data. The data platform will also serve as a tool for city mobility planners and an open access data source for innovators that can, for instance, help to provide new mobility services (MaaS) that uses a single app to access and pay for various transport modes, both public and private, within the city. The goal of MaaS is to make it so convenient for users to get around the city in that it offers last mile solutions and provide an alternative to private transport. The challenge for Lahti in this regard is whether a city of around 120,000 provides significant sized demand for

new mobility providers and whether there is a wide enough range of transport modes in the city for MaaS to work.

Data quality will also be important as reliable information must be provided to users. There is also the issue as to whether a third party is willing to sell their service as they will need to see the business case for doing so. There are also considerable **issues about personal data security and privacy** to contend with which is perhaps the biggest challenge and a very sensitive issue to contend with. Holistic solutions must be found so it will be essential to integrate the platform with the PCT and SUMP, so that smart investments can be mutually beneficial.

## 3.3 Developing the mobility environment - Sustainable Urban Mobility Planning (SUMPs)

The 2013 EU Urban Mobility Package sets out a concept for SUMPs that has emerged from a broad exchange between stakeholders and planning experts across the Union. The concept describes the main features of a modern sustainable urban mobility and transport planning. The European Commission has actively promoted this concept for several years but it is currently not mandatory

to implement a SUMP for Finnish cities unlike in other Member States.

On the basis of previous experience and projects in the EU, four major challenges emerge which CitiCAP will need to address. Firstly, SUMPs establish the principle that people should be actively involved from the very beginning of the transport planning process. This will require

involvement of stakeholder groups, especially hard to reach ones (e.g. mobility impaired people), notably when integrating the SUMP into the city Spatial Master Plan 2017-2020 which is being established at the same time.

Institutional cooperation will be essential, notably given the strong links with urban planning, transport and environment in this project. Without it, a SUMP will be partial and result in few benefits as a siloed approach to delivery will be taken. A diversity of actors will need to be engaged and enacted to ensure SUMP delivery which will involve both vertical and horizontal cooperation. Therefore, in all cases, SUMP partners will need to work under one roof which may involve both public and private actors, with the former potentially working towards different regulations and guidance.

Thirdly, selecting the most effective package of measures in a SUMP will be key. These should be suitable, cost effective and deliver multiple co-benefits. As a wide range of measures are available, it can therefore be difficult to identify the most appropriate measure. There are also times when it is necessary to introduce measures that reduce travel demands which can meet some resistance by those affected. Furthermore,

many measures may not be easily implementable due to a lack of funding or split responsibilities between city departments or organisations as outlined above. It is essential to identify a range of appropriate and mutually reinforcing measures with clear lines of responsibility. Finally, the monitoring and evaluation of such measures can be complex, especially the need to provide regular and timely information for decision makers. Typical challenges around this include a lack of experience, limited resources (financial and staff), gaps in technical knowledge or simply a lack of capabilities to select, collect and evaluate the data. However, the largest challenge is not in the development of a SUMP but rather its implementation.

While the above highlights some of the high level challenges of the project, a number of specific challenges have been identified that cut across all UIA projects. The table below provides a traffic light analysis of what these are and some observations as to how the project fares against them based on planned initiatives. Future Journals will focus on these in more detail and the progress made in addressing / mitigating them.

**TABLE 1: MAPPING CiTiCAP AGAINST THE ESTABLISHED UIA CHALLENGES**

<b>Challenge</b>	<b>Level</b>	<b>Observations</b>
1. Leadership for implementation	<b>Low</b>	Recent local elections have taken place and new leadership and commitment to the project will help to ensure collaboration across a range of city departments going ahead.
2. Public procurement	<b>Low</b>	Minor procurement issues at this stage. Technical issues related to the PCT will be a far greater challenge.
3. Integrated cross-departmental working	<b>Medium</b>	Given the range of stakeholders involved and the need to engage a range of city departments, this remains challenging. Leadership for implementation is hoped to overcome this.
4. Adopting a participative approach	<b>Low</b>	High levels of participation evident across stakeholder groups. A core facet of the project.
5. Monitoring and evaluation	<b>High</b>	Integrated accounting of carbon emissions, monitoring mobility habits, personal data protection issues, accessibility and SUMP implementation is a challenge.
6. Financial Sustainability	<b>High</b>	Evident potential but as the first pilot project, the financial long term sustainability of PCT is untested.
7. Communicating with target beneficiaries	<b>Low</b>	By adopting a participative approach, significant communication and buy-in with citizens is planned.
8. Upscaling	<b>Medium</b>	As a pilot project, the opportunities for upscaling are unknown.

## 4. Progress to Date

In order to assess progress, it is worth noting the planned key milestones of the project:

- **January-May 2018:** Planning of open mobility data possibilities.
- **May 2018:** Policy draft explaining different PCT models.
- **May 2018:** Participatory process description of integrated SUMP + Master Plan.
- **June-July 2018:** Innovation competition on smart bicycle highway solutions.
- **October 2018:** Mobility data platform architecture established.
- **December 2018:** Fair personal allocation of carbon reductions targets co-designed.
- **April 2019 - September 2019:** Testing of the PCT system.
- **September 2019:** EU Mobility Week / Lahti festival. Launch of the PCT scheme.
- **June 2019 - June 2020:** Building phase of a smart main cycle route working as a pilot arena for smart mobility services and visible arena for PCT.
- **November 2020:** Final conference.

Encouragingly, significant progress has been made in addressing the above main challenges so that key milestones can be reached which the city can be rightly proud of.

### 4.1 Changing the mobility attitude and behaviour - PCT

The development of the model and design of the platform for PCT has been the main focus during the first months of the CitiCAP project. Earlier this year, previous attempts to implement personal carbon trading have been analysed which has fed into Lappeenranta University of Technology's development of the model for PCT.

Personal mobility tracking is being tested with a PCT mobile app, which can identify different types of mobility, as well as time and distance travelled. Emission rates for different types of mobility have been finalised, Lahti-specific data is used for estimating emissions from public

transport. Work has now started on producing information packages to help inform citizens on how they can reduce their emissions.

Workshops on how to allocate the carbon budget have been held where stakeholders were asked their views on how this could be done fairly and proportionally. Identification of the baseline emissions data of citizens over a 3-6 month period will be conducted in the following months which will define the carbon cap based on the city's targets and will form the basis of the pilot baseline data.

## 4.2 ITS and sustainable urban mobility planning and services

The user interface (UI) of the PCT app designs and functioning were presented at the CitiCAP Steering Committee on 28 September for approval in October. The proposals outline the design and functioning of the UI, how the app will inform participants of their emissions and provide an easy interface so as to allow participants to trade rewards for having low emissions footprints on the market place.

The development of the platform that will provide the basis of the PCT and UI has moved to its final stages. Challenges around how to deal with the protection of personal data (notably with third parties) is not envisaged to cause any major problems with the end October deadline looking achievable. Encouragingly, the implementation of the GDPR - the EU's general data protection regulation established in May 2018 - has been integrated into the project at the start.

## 4.3 Developing the mobility environment - SUMP

Efforts linked to CitiCAP and the SUMP process in 2018 have focused on citizen engagement. Understanding the motives behind people's decisions is a big piece of the CitiCAP puzzle. Over the course of the spring through to the autumn, 17 events have been held to get citizen's views so that they can be integrated into the spatial planning and SUMP process, as well as to raise awareness of the CitiCAP project.

It is crucial that the project engages third parties, notably through the PCT market place. Some of the largest companies both nationally and in the region have been engaged and has attracted positive attention. It is perhaps better to engage small, local businesses as this offers the opportunity to support and build local business and allow them to reach out to a significant amount of local citizens which they might not otherwise be able to do given their resources at hand.

Local university students are also engaged and feeding into the city master plan and SUMP process. Next year, the project will move towards the proposal phase which will see a four year implementation programme from 2021 once it has been approved.

Scaling up smart transport solutions will also need to be at the heart of the SUMP process. Of the four cycle highway designs identified, the preferred route has been selected with construction work of the 2.5km route planned to start in 2019. The lane, reserved only for bicycles, will serve as a test bed for smart solutions that will assist in the further development of bicycle tracks around the City. An innovation contest for smart solutions took place during summer which identified a number of smart solutions which will be considered as part of the scheme (e.g. smart lighting, smart bike docks and the use of recycled material in the construction of the bike path).

## 5. Conclusions

The challenge for any project is to **deliver it on time and to budget**. With so many different aspects involved with the CitiCAP project this will be a challenge but also given that this is the first PCT initiative to be rolled out, with no lessons learned to go by, it will mean that the most interesting parts of the project are yet to come.

The second challenge will be to **engage citizens and maintaining their involvement**, buy-in and understanding. Data protection issues will forever be a challenge. It was well foreseen to involve citizens at every stage of the process as it offers a better opportunity for a long-term approach that can move this beyond a project - that would typically have a beginning, middle and then end - to a city initiative that can be scaled up and taken up by other cities in Europe and beyond.

Finally, it will be essential that this project is **communicated beyond the city**. As the first PCT ever in the mobility sector, its findings and results should be integrated into the wider climate debate. It is increasingly recognised that non-state actors - such as cities - will be key to delivering on the Paris Climate Agreement, so it is essential that innovative policy options be shared and highlighted, particularly in the transport sector.

As this is the first Journal of the CitiCAP project, the aim was to provide a high level summary of the project, the challenges and a snapshot of progress made to date. The next Journal will focus more on the mapping of the project against the established UIA challenges, developments of the PCT scheme and some of the main stakeholders involved in the project.



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Further to interviews with key members of the CitiCAP project, the following sources supported the collation and drafting of this journal:

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Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.



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