CONTEXTUALISING MOBILITY VARIABLES

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ABSTRACT

The project Cities-4-People focuses on co-designing transport and mobility in five distinct municipalities in Europe: Oxford (UK), Hamburg (DE), Trikala (GR), Istanbul (TR) and Budapest (HU). Despite cultural and geographical differences, these cities highlight the need to re-shape their infrastructure in order to improve citizens' lives through better urban mobility. The key challenges in all five cities are those related to public and private transportation modes into how to better cater to citizens' needs. To tackle some of these challenges, the project sets itself the task of bringing together key stakeholders to co-identify problems and target areas, followed by various activities and workshops to co-design future solutions. By bringing together municipalities, research institutions, transport authorities and citizens, Cities-4-People will create a model for cities on how to tackle similar issues, by applying the models developed during the project. The co-creation approach, aided by the proposed people-oriented transport and mobility (POTM) framework, focuses on tackling a number of challenges: how to bridge cultural norms and expectations through methodologies; how to accommodate key variables (such as geographical conditions) in the process; how to make sure the results are comparable and applicable in other urban contexts. This paper focuses on presenting how a structured framework to address these challenges early in the project process sets clear goals to be achieved when co-designing transportation and mobility services.
Keywords: Mobility, transport, urban governance, POTM, co-creation, citizen participation.

1 INTRODUCTION

This paper's contribution lies in introducing the POTM framework as a tried and (initially) tested bottom-up approach engaging multiple urban stakeholders in resolving urban mobility challenges, such as congestion, exclusion, information accessibility, use of alternate modes of transport, etc. We analyse how the POTM framework applies across five European cities with very different cultures, geographies and governance systems. This analysis uncovers fixed features that should be adapted "as is" and variable features that are adaptable to the uniqueness of each city.

Cities are living entities. They breathe and feed, develop and thrive. In cities' ecosystems, a number of factors play a determining role in how cities become places and homes to thousands of people. In this living metaphor, streets and roads are the veins of a city; they help cities breathe, providing flow and the nutrients to keep it going. As in veins, when blocked, they cause distress and need bypassing or a reflection on habits in order to re-establish the flow. The Cities-4-People project is aimed at exactly this process, to understand which aspects are blocking the "veins" of five pilot cities in Europe in order to change them and create newer and better flows that can answer to current and future demands.

The Cities-4-People (C4P) project engaged the districts of Altona (in Hamburg), Üsküdar (in Istanbul), and the municipalities of Oxford, Budapest and Trikala to assess, de-block and re-shape their mobility and transportation. In order to achieve this, this project proposes the people-oriented transport and mobility (POTM) framework, focusing on the emergence of open, inclusive and transparent mobility communities. This framework reinforces bottom-up procedures, providing the settings required to design and produce demand-led urban mobility innovations that will not be imposed on either citizens or institutions but will be commonly agreed upon and accepted. Therefore, the city partners must follow a number of set project guidelines with the aim of challenging current approaches to urban planning strategies.

Among these conditions is the inclusion of various stakeholders, such as municipal representatives, transport authorities, bicycle association representatives, local citizens, higher education institutions, etc. These groups of stakeholders are set to work together, making use of co-creation methods in order to research, debate, choose and implement short-term interventions that will guide future long-term changes to the mobility flow of cities.

The five cities were chosen for their different sizes, cultures, geographies and governance systems, dealing with a range of mobility challenges. By exposing the POTM framework to different urban contexts, we are able to better tailor the framework for future deployment. The fixed and variable features will be refined through the adaptation of the framework to a broad variation of urban contexts.

The cross-national applied approach of the POTM framework presents its own challenges. Different cities not only have specific local profiles and problems, they also have a set of distinct variables that need to be considered throughout the process. For example, when analysing survey results, we need to assess geographical and climate aspects according to their impact on mobility choices. In another example, to better analyse and evaluate respondents' responses, we need to acknowledge both cultural expectations and local ways of experiencing transportation modes. Consequently, the methods used in this project not only need to be replicable but also adaptable, without losing their validity or purpose. They cannot be "lost in translation"; it is of great importance to train the C4P partners in using such methods, as well as challenging their way of seeing and working in their own cities.

This article firstly presents baseline concepts of the project, followed by briefly presenting the existing contexts in the five pilot cities. The third section presents what we have accomplished so far and the current and upcoming steps in the project process. We conclude with a short summary and present how the project approach is tackling some of the encountered limitations.

2 MAPPING THE NEEDS OF VARIOUS STAKEHOLDERS

Mobility has been defined as the ability to reach places through availability and accessibility [1], [2]. Nevertheless, what does mobility mean to different people with different roles? From a train company's perspective, it might relate to the train availability, to the condition of stations, wagons and tracks, to times and locations. To commuters, mobility might mean another thing, such as how they go from A to B, how they get to stations and obtain information about trains, buses, prices. For municipalities, mobility means providing good infrastructure with roads and pavements, plus traffic authorities. Therefore, even though the term mobility derives from the ability to move, it has distinct connotations depending on different stakeholder perspectives. Consequently, the term mobility encompasses a complex picture with multiple angles.

Mobility has also been linked to being a key component in quality of life, providing a range of benefits [3], [4]. In cities, mobility is directly linked to modes of transportation. Transportation is a key facilitator in moving people and goods, becoming the cells of the mobility veins. In this life-metabolism metaphor, the nutrients, or the people and goods that move and maintain the everyday life in a city, need to be able to flow with ease and feel confident about reaching their destinations and goals. To understand what it takes to fulfil these goals, we need to expand current urban planning standards to be more inclusive and democratic. Co-creation, bottom-up grassroots and user-centred approaches have been highlighted as having a positive impact in urban contexts/transport and mobility innovation [5]. Therefore, the POTM framework was developed taking into consideration best practice approaches from other cities, gathering a wide range of stakeholders to work together successfully to tackle mobility issues.

In one example from the city of Rome, the project "Sbilanciamoci per la Mobilità" [6] also focused on rethinking and re-structuring Rome's transport and mobility framework. They identified key advantageous methodological aspects from which we highlight the following: co-participation of citizens; decentralisation of policies; continuity to give feedback about effects of policies; and integration of projects and urban policies.

By understanding the different stakeholder perspectives, we are able to assess and prioritise needs, as well as identify correlating and conflicting requirements. This assessment will enable us to tailor the POTM framework to the specificities of each of our pilot cities.

2.1 Co-creation or flattening a hierarchy

Our project methodology is composed of two complementary approaches. As presented in Fig. 1, the first approach informs and defines the project process and activities (POTM); the second one evaluates it (core outcome set (COS)).

The POTM framework is based on the Quadruple Helix innovation (QHI) model [7] that includes four stakeholder levels: government, academia, industry (business) and citizen. This model provides the baseline for ensuring an inclusive and open process, which empowers a wide range of citizens with different stakes in the process, fostering exchange and learning among cross-sectoral groups.
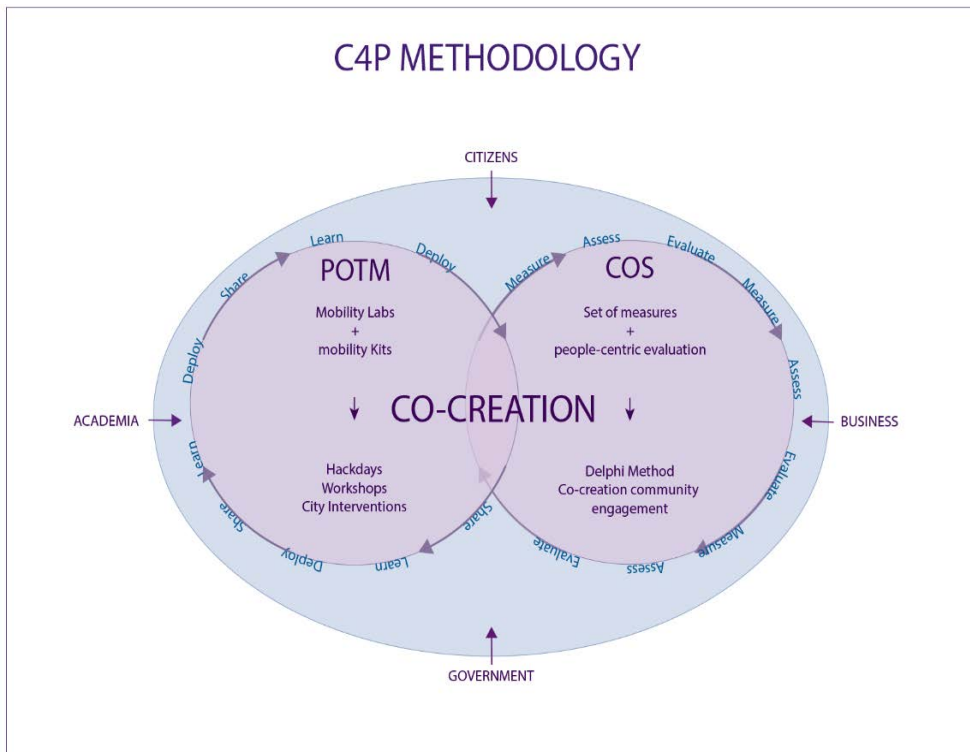

Figure 1: Cities-4-People methodology model.

The framework has the following guidelines:

- Focus on the entire value chain – it is bigger than the sum of its components;
- Follow an inclusive approach where we are open to everyone and any idea. This also includes structures, processes, data and models. We invite multi-sector actors to participate at any stage of the innovation process;
- Nudge but not push. We believe in the prospects of the shared mobility as a baseline for promising sustainable solutions, but we do not want to delimit or pre-empt our communities' creativity.

By committing to the project, each pilot city has followed the POTM structure and goals, making sure to be inclusive by bringing together their citizens and other key stakeholders, such as transport authorities and municipalities. To apply the QHI model, we selected a range of co-creation tools to be developed and deployed throughout the project: citizen mobility labs and kits, hack days and co-creation workshops.

These tools aid the project in avoiding some of the pitfalls experienced in previous projects [6], such as bridging the communication and time gap through training and applying co-creation tools with all stakeholders. For this, C4P is committed to raising awareness, informing and engaging by making the dynamics of the project process transparent and having an open-door policy by providing a space where the stakeholders meet and learn from and with each other.

Citizen mobility labs are spaces that bring together research and developments into everyday life contexts. They promote a space for "creating successful innovations in an open community setting" [8]. In this project, the labs are to be placed in the chosen intervention area, also fulfilling a communication task, where passers-by can learn and follow the project goals and processes. Curley and Salmelin [7] point out that: "It is imperative for the Living Labs to create attractive innovation ecosystems following the quadruple helix innovation model (i.e., including the user), where the innovation trials and scale-up can happen more successfully due to strong engagement of the citizens in the regions. Living Labs can be seen as one example of the open innovation ecosystem development beyond traditional test beds that have usually been technology driven" [7].

Hackdays are intensive working days, also known as hackathons. Hackathons have been popularised by the tech industry, but rapidly evolved to other disciplines [9]. Hackdays are characterised by having a short time span when small groups work together on a specific problem from concept to implementation. These events take place in a common location, and in our project, they take place in the citizen mobility labs and in the city streets in the form of urban interventions.

Co-creation workshops are workshops focusing on presenting, learning and applying specific tools that compose the mobility kit. During these workshops, the project's stakeholders come together to learn the tools and create strategies and possible concepts that can be further developed during the project. Steg and Gifford suggest "the concept of co-creation was an extension of the idea developed by researchers interested in user-driven product innovation. … the co-creation efforts they studied demonstrated impressive increases in value" [10]. In this sense, co-creation can potentially be a catalyst for changing the way decisions are made and solutions are implemented. The project ensures a less hierarchical structure, providing results created and developed by all project stakeholders, and taking into consideration the various groups that might be impacted by the implementation of these solutions.

Regarding evaluation, the project is committed to co-developing and co-defining the core outcome set (COS) methodology. COS is composed of:

- an agreed minimum set of measures;
- a clear recommendation of "what" is to be measured and reported across the different city pilots;
- assessing the project's success in reaching stated goals;
- evaluating the before and after intervention based on data collection.

COS promotes a novel evaluation methodology and metrics involving the project stakeholders to decide and agree on a set of measures, therefore promoting all the stakeholders involved to further commit and gain project ownership. This set of measures is the baseline for evaluating the impact of the project interventions – guiding and improving future planning and the allocation of resources in upcoming urban developments.

3 CURRENT TRANSPORT CONTEXTS IN THE FIVE PILOT CITIES

Pedestrians, drivers, cyclists and commuters need to seamlessly integrate into one sustainable mobility flow, which is a challenge faced by many cities, including our pilot municipalities of Üsküdar, Trikala, Budapest, Hamburg and the county of Oxfordshire. In order to understand and improve their urban mobility, these pilot cities engaged a range of local stakeholders, such as citizens, municipalities, transport authorities and other related stakeholders (cycling and other associations for mobility impaired, etc.) in identifying and mapping existing mobility challenges.

The C4P project launched in June 2017, and, as a first step, the city partners needed to understand what characterises mobility and transport issues in each of the pilot locations. In order to fill this knowledge gap, two sets of investigations were designed and applied. The first was an online survey, making use of the Maptionnaire [11] tool, which allowed for a more focused geographical identification of preferred routes, distances and challenges. This survey was complemented by a set of qualitative interviews with local citizens, focusing on identifying preferences and reasons behind some of the mobility choices and which types of current impediments are framing these regions.

These locations, besides having distinct demographics (see Table 1), geographies and cultures, also differ in how their transport systems are planned and developed. Due to the nature of this project, we need to understand what characterises current governance and decision-making structures to ensure that all stakeholders are identified and included.

Therefore, it is important for a successful project outcome to have an overview and acknowledge current transport governing processes (Fig. 2). The POTM framework proposes a new angle in the decision-making process, and to achieve this we need those people currently in charge to believe and be involved in the whole C4P project process. By having

Table 1: Population per pilot location.

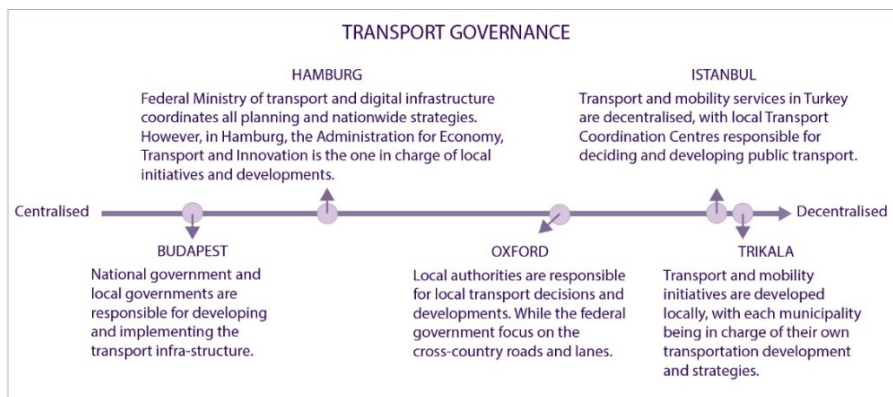| Aspects	Locations				
	Oxford	Budapest	Trikala	Üsküdar (Istanbul)	Altona (Hamburg)
Average population	161K	1.7 million	62K	500K	262K

Figure 2: Pilot cities' transport governance overview.

public authorities on board, this project aims to achieve not only successful results within the timeframe of the project but also possibly change the way future governing strategies are designed and implemented.

4 INITIAL RESULTS

The online survey used the Maptionnaire [11] platform and reached a high number of respondents, totalling 2,550 respondents from all pilot locations. This platform provided a local map where respondents could indicate their daily routes and ways of commuting. In each pilot city, the local partners conducted semi-structured interviews with 15 different stakeholders, totalling 75 interviews.

Issues dealing with congestion, limited access to information about transport options, poor infrastructure to support alternate transport options such as bicycles or walking are key aspects in all the regions, irrespective of geographies and sizes.

In Table 2, we present an overview of some of the challenges faced by each of the five pilot locations.

The workshops succeed in the following:

- Assessing the local stakeholders to start the community building process;
- Introducing the project;
- Introducing the project approach.

The workshops started taking place in the autumn of 2017 in each of the pilot cities. In the initial sessions, diverse ranges of stakeholders learned about the project, survey and questionnaire results. Based on these results, stakeholders analysed transport and mobility challenges that the pilot cities and their citizens currently face and identified some of the reasons that may be causing such challenges.

The workshop sessions prioritised challenges and areas for intervention activities during the lifespan of the project. These choices were based on impact and feasibility. These secondary sessions were called co-creation workshops, where the partners carried out a specific set of exercises previously designed, set up and shared with them by one of the project partners. The exercises had distinct goals that varied from setting achievable goals for the project to using creative methods focusing on how to tackle some of the mobility challenges during the project's timeframe.

Table 2: Overview of survey and questionnaire results.

Research results: identified challenges	Locations				
	Oxford	Budapest	Trikala	Üsküdar	Altona (Hamburg)
Public Transport	Bus services are not frequent enough and not well connected. The time lost in congestion. Lack of real-time service information. Service costs.	Time lost in congestion. Lack of full integration of transport modes and their operators. Lack of an integrated service connecting urban and suburban routes.	Traffic congestion in the city centre. Lack of dedicated bus lanes. Service price. Low-frequency of services (weekends, holidays and late hours). Poor real-time service information.	Heavy street congestion. Lack of integration of transport modes. Limited service hours and frequency. Service prices. Poor maintenance of vehicles.	Large distances between stations and stops. Low frequency of services.
Walking	Narrow paths, difficult walking flow. This is aggravated by uneven surfaces and poor pavement maintenance. Cars park on pavements. Lack of continuity of walking paths. Concerns about safety – perceptions of crime.	Air and noise pollution impacts the choice of walking. Lack of continuity between pavements and underpasses. Lack of green spaces and resting areas.	Poor pedestrian infrastructure to serve mobility-impaired citizens. Poor pavement maintenance.	Pavements are too narrow and shared by cars and restaurant tables. Lack of green spaces and resting areas. Too much jay-walking.	Air and noise pollution impacts the choice of walking. Narrow pavements, shared with bikes and parked cars.
Cycling	Lack of continuity of cycle paths. Safety concerns due to poor condition of sustainable transport infrastructure on cycling routes.	Infrastructure needs expanding to service a larger and more diverse audience.	Poor connectivity of cycle paths.	Geography – hilly. Underdeveloped cycling infrastructure.	Lack of bicycle parking. Disconnected cycling routes. Poor signage.
Private Vehicle	Congestion. Lack of affordable parking provision inside and outside the city. Road network.	Congestion. Road conditions. Not enough parking spaces in the city centre.	Traffic congestion in the city centre. Illegal parking in the city centre. Taxi prices are competitive with that of public transport.	Congestion. Lack of parking. Driving can be stressful.	Congestion. Lack of parking. Unstructured and illegal parking.
Sharing Services	Need more development.	Need more development.	Need more development.	Need more development.	Need more development.

The outcomes of these workshops were key in framing and better contextualising local issues through the eyes and voices of various groups. By taking this range of perceptions into account in the process, not only were the city planners able to acquire a distinct perspective on how the city is experienced by different groups (e.g., cyclists, pedestrians, commuters, elderly), but, most significantly, they understood the importance of being more socially inclusive in decision-making processes.

Currently, the five locations are deeply involved in developing the next step in this project, setting up a citizen mobility lab. We defined citizen mobility labs as spaces dedicated to communicating, disseminating and informing the local audience about the C4P project and serving as an inviting platform where citizens can learn and possibly engage with the project and its community. These labs can take both moveable and fixed forms. The moveable form can be in the shape of an open vehicle carrying various materials, setting itself up in different locations and at different times in the chosen neighbourhood. These moveable labs will reach out to citizens by going to them where they are, as well as hosting events and having an open booth where activities and Q&As can take place.

The fixed labs are to be located in the centre point of the intervention area in each of the five locations. These labs will serve a similar purpose to the moveable ones – being there where the people impacted by the project are and making sure they are not only aware of the initiative but that they feel compelled to have a say in the project by joining the community.

The purpose of these labs reaches beyond an immediate outcome. By bringing people together, the project is developing and sustaining a community that should linger beyond the project's timeframe. Creating a community entails more than bringing people together. It needs to facilitate a transfer of power so that local citizens own the project and feel empowered to continue developing it. By feeling responsible and committed, besides also feeling heard and acknowledged, this community has the potential of becoming a valuable platform for future mobility changes and adaptations in these five pilot urban contexts.

5 CONCLUSION

This paper introduced the POTM framework in the C4P project. This framework primarily disrupts top-down approaches through its inclusive and democratic angle, engaging a wider audience to commit and decide on the way they move in their cities. The framework provides a space where a range of stakeholders, including citizens and municipal and transport authorities, work together to both understand and develop better urban mobility. It implies a process where all stakeholders are active listeners, learners and creative concept developers.

The considerable and comprehensive aspects of this project face their own challenges. Being visible and standing out in an already overloaded and information rich society can be quite difficult. Therefore, all partners chose to use a range of communication tools, including digital and analogue, to maximise their reach. This requires all partners to be aware of which types of media are most prominent among the various groups in their local areas.

It is also important to keep the project momentum in the communities; therefore, the project partners have planned and carried out diverse activities at relatively regular intervals, which means quite an intense workload for project members.

The project framework allows for a common set of specifications and tools to be experienced and applied in distinct cities and cultural contexts. Therefore, the project partners share a baseline structure and, despite cultural and geographical variables, are able to identify with each other's challenges and methods. The project partners are encouraged to share their experiences and activities with each other throughout the process through bi-weekly group calls, which provides real-time learning and exchange. This regular exchange improves the

project process, as project partners learn from each other's attempts and successful stories and incorporate this learning into their own local processes.

A clear framework provides a project setting where collaboration can flourish. Running the same process and methods across five distinct pilot cities help us refine aspects of the co-creation process to be universally deployed in future urban scenarios, helping cities breathe and sustainably evolve their flow for a better quality of life.

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