CITTA

13TH ANNUAL CONFERENCE
ON PLANNING RESEARCH

PLANNING FOR HUMAN SCALE CITIES

EDITED BY CECÍLIA SILVA | CATARINA CADIMA | MIGUEL LOPES | PAULO PINHO

THE RESEARCH CENTRE FOR TERRITORY, TRANSPORTS AND ENVIRONMENT

Citta
FEUP UNIVERSITY OF PORTO
FCTUC UNIVERSITY OF COIMBRA

Design Gráfico: Ana Proença

Rua Dr. Roberto Frias, 4200-465 Porto

Este trabalho foi financiado por: Financiamento Base - UIDB/04427/2020 da Unidade de Investigação - Centro de Investigação do Território, Transportes e Ambiente - CITTA - financiada por fundos nacionais através da FCT/MCTES (PIDDAC).

This work was financially supported by: Base Funding - UIDB/04427/2020 of the Research Center for Territory, Transports and Environment – CITTA - funded by national funds through the FCT/MCTES (PIDDAC).

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Foreword

After the interruption of the traditional annual CITTA conference in 2020 (the conference series started in 2008), due to all the initial doubts and uncertainties that characterised the first months of the Covid pandemic, the Centre's management board decided to go ahead with the 2021 conference, this time online. The board was very much aware of the difficulties the organizing team would face given the persistence of the pandemic and the then-generalised lockdown situation in the country. Still, a group of researchers, headed by Cecília Silva, decided to prepare and submit a proposal to CITTA's internal call for the organization of the conference. One of the motivating reasons for this decision had to do with the closing of the BooST research project – *Boosting cycling strategies in starter cycling cities* – and the possibility to articulate the final conference of this project with CITTA's 13th annual conference on planning research.

The organizing team chose *"Planning for human scale cities"* as the main topic and title of the conference. The revisitation of this recurrent topic in planning was very justified. Over a year into the Covid-19 pandemic, cities all over the world have been experiencing unprecedented changes and challenges. Never before has the importance attached to local scale proximity, to the sense of place and of the closeness of neighbourhoods, as well as to the quality of public spaces and of local services, become so evident. As the introductory text to the conference emphasises, a human-centred approach is much needed these days, focussing on fostering the user-friendliness of the urban environment and on generating lively and liveable cities.

This book of proceedings includes nine texts out of over 50 conference presentations. The range of topics covered by this collection of texts, as well as the diverse origins of the authors/presenters, is fairly representative of the debate that took place in the various plenary and parallel sessions of the conference. As expected, the discussions' common denominator centred on the different approaches to human-scale city planning.

A final word of thanks to the team of the BooST project, including the colleagues from Aveiro University, to all the members of the organizing committee, and in particular to Cecília Silva, the conference chair, and, last but not least, to the two keynote speakers, Marco te Brömmesltroet from the University of Amsterdam, and Carlos Moreno from the Pantheon Sorbonne University, for their most inspiring and thought-provoking addresses.

Paulo Pinho

Director of CITTA

re-Route Project

Amanda Cavalcante, João Ferreira
Master in Spatial Planning and Urban Project - FEUP
bramandac@gmail.com; jgabrielmf@gmail.com

A Personalized Journal Planning (PJP) is a complementary measure that aims to help individuals with information regarding the concerning possible paths for walking, and the best way to access public transportation. The objective of the Re-Route Program is to present an experimental assessment of the effects of a PJP directed at temporary residents of Porto, aiming to convince them to remain traveling on foot once they return to their respective home places.
In this experimental program, we selected a small group of temporary residents of Porto to experience alternative paths of commute throughout the city. We created alternative routes with information about their current paths and preferences in commute. Besides their fresh routes, during the week of implementation, they received daily messages with information and encouragement concerning the act of walk. We asked the participants to plan and use the alternative routes following their schedules and to take note of characteristics of the paths, such as comfort, convenience, and safety. After the experiment, we asked them about their overall experience and impressions of the alternative paths.
The initiative presented favourable results with participants that already had a positive attitude towards the act of walk. It was successful in engaging people, allowing them to think about their role in the city as travellers and the responses the city should give to make the life of walking commuters more comfortable. As a minor achievement, the experiment was successful in collect relevant data and set up information for future programs.

Keywords: walking; experimental; routes; travel behaviour.

1 Introduction

Public authorities can influence use, travel behaviour, and mode choice through many kinds of initiatives. The shape of the built environment and the planning of transport infrastructure are among the main functions of the government. A city can determine the modal structure of its transport system through a range of initiatives such as regulations, funds, and operation of public transport systems (Lah, 2018).

Amidst the initiatives, the concept of Travel Demand Management (TDM) is used as a method to lessen the impacts caused by congestions, pollution, and diseases. TDM is presented as an alternative to building more roads or services for cars. Rather, the authorities focus on reducing the use of cars and motivating the shift of individual-motorized to sustainable alternatives, such as bicycle or foot and public transport (Geng et al., 2020).

Many of the measures of TDM are directed towards changes in regulation, investments, subsidies, tolls, and taxes as means to generate the desired changes in behaviour. In addition, information is also registered as a notable persuasion strategy to promote sustainable travel behaviour considering

that travellers can be influenced by, knowledge awareness, and attitudes (Geng et al., 2020). The Personalized Journal Planning is a targeted focused measure that aims to help individuals with information regarding the best alternatives to the car, concerning the possible paths for walking and the best way to access public transportation.

The objective of this study is to present an experimental assessment of the effects of a Personalized Journal Planning targeted at temporary residents of Porto with the intention to convince them to remain traveling on foot once they return to their respective homeplaces. The main questions of the assessment are the following:

1. Can an intervention of Personalized Journal Planning that includes a mix of advertisement of health and environmental information with route planning influence people to remain walking as their main travel mode?
2. The quality of routes can influence their opinion about walking as a travel mode?

2 Theoretical Backup

2.1 Travel Behaviour

The transtheoretical model of behaviour change is a form to assess an individual's willingness to act on a new behaviour. The model also presents strategies and the processes of change to guide an individual through their process of transformation. According to the model, change of behaviour advances throughout six stages: pre-contemplation, contemplation, preparation, action, maintenance, and relapse.

According to Stein & Rodrigues da Silva (2018), several studies in the field of transportation used the transtheoretical model. Interventions based on the model were able to help people to start walking or cycling or reduce car use on a daily basis. Another use of the model was to evaluate and identify barriers and motivations that can affect travel behaviour. Such studies helped researchers to identify obstacles, incentives, and policies to promote sustainable mobility. For instance, Stein & Rodrigues experiment showed that car ownership is one of the main barriers to the adoption of sustainable modes. In this context, the population with no access to cars corresponds to a valuable target for specific campaigns and initiatives in mobility management.

A different model of analysis demonstrated that changes in behaviour related to bicycling were almost every time associated with significant changes in the context of life, such as moving to another town or changes in employment, rather than alterations in the external environment (Chatterjee et al., 2013). That suggests that timing the programs and interventions with these changes could probably increase its success rate.

The community of temporary residents of the city of Porto that arrived recently to the city fits in both categories. For once, they have recently experienced circumstantial changes in their lives since they moved from another city or country and, for related reasons, do not have access to an automobile.

2.2 Improving Nonmotorized Travel Through Interventions

Strategies of persuasion to encourage nonmotorized travel can have several kinds of arrangements. Many initiatives focus on spreading information and knowledge to capacitate people to travel in the desired mode. Other solutions are directed towards making people leave the stage of contemplation and engage in new experiences of travel (see the initiatives' summary in Table 1).

Preparational and navigational competence are necessary for individuals to use with efficiency the different modes of transportation. The installed infrastructure in the form of safe pathways, cycling lanes, or storage for bikes is crucial for encouraging modal shift. However, the process also depends on the awareness and capability of the targeted population. Preparational capacity is related to the knowledge to do basic repairs or change flat tires, for example. To use public transport, people need to know how to buy tickets, access information about the travel itinerary and the location of stops. Navigational competence is related to the capacity of navigating in between different modes or even to found and take effective paths (Cox, 2021).

Davies (2012) study presents the potential of awareness campaigns to boost shifts in transportation modes. In his analysis of twenty initiatives directed towards change in travel behaviour, the direct interaction with the targets, personnel communication, branding, and information credibility were remarked as significant elements of design in successful campaigns. The research also highlights as an external success factor the quality of the infrastructure available. Many of the successful measures were associated with infrastructure investments.

2.3 Initiatives of Personalized Journey Planning (PJP)

Personalized journey planning is a program executed by authorities whose goal is to encourage a shift in mode use by helping individuals to adopt car alternatives in their daily trips. The uniqueness of the initiative is in the individualistic approach in which the target receives specific information about the existing options for their travel, making use of public transport, bicycles, and walking. The basic method of this type of initiative is to conduct interviews and surveys to obtain information about the individuals' journeys. The data collected provides information to create and study multiple examples of the same trip. After considering the particularities of everyone, the planner ensures that the recommended alternative is satisfactory. The participants receive the new journeys and are encouraged to use and evaluate them (KonSULT, 2016).

2.3.1 Travel Blending, Sidney and Adelaide.

The Travel Blending program was an Australian government project that took part in the Clean Air 2000 initiative to reduce pollution caused by car travel before the Olympics in Sydney. The program intended to decrease the use of personal vehicles by tracking the travel behaviour of residents and encouraging individuals to reduce the use of their cars, mixing their travel options over time.

Participants received a series of kits containing information and a travel diary that they were supposed to fill in for a week or two. After this stage, the journals the project examined the journals team

considering the displacements and modal options available for that route; thus, the participants received their second kit with their personalized paths with car usage reduced or ended. Residents used the alternative ways for a few months. By the end of the experience, they received one last kit with a new diary containing a comparison of the savings they made (economic and environmental) using the new routes. Authorities helped the participants with plans for activities and journeys, public transport mixing, and a program of changes in small steps to reduce car usage.

The initiative helped participants to reduce the use of cars with a small steps program. Journeys and activities should be carefully planned; the mix of transport modes was encouraged; the participants were prompted to do as many actions as reasonable in the same areas and on the same trips (Rose & Ampt, 2001).

The focus of the initiative was to encourage minor changes from time to time. The approach allowed the participants to attend activities as they found convenient. That way, instead of telling people they should take public transport, they were asked to combine travel options in a more sustainable way. (BeHealthyRVA, 2001; Rose & Ampt, 2001).

The Australian government initiative presented a model for designing a step-by-step program to facilitate the itinerary of participants. The major lesson is that communication must not be delivered in a demanding state. Instead, it needs to invite the participants and make them feel comfortable with their tasks. The proposed routes should be carefully planned to be as convenient as possible to increase their engagement.

2.3.2 Portland SmartTrips

SmartTrips is a marketing program of the city of Portland to inform its residents about options of transportation. The program comprises mass transit, walking, bicycling, carpools, and car-sharing. The aim is to decrease the number of car trips and increase the usage of soft modes in specific areas of the city. The initiative is composed of informative maps to help people in walks and cycling and events with activities to disseminate knowledge of how to travel through the city without a car.

The program used guides with information about how to safely walk and cycle and informative reports, along with a program of convenient walks and bicycle rides. The encounters encouraged the participants to walk and cycle together, to discover different routes and to adopt new modes of travel with more confidence.

The SmartTrips program possesses a top-down approach with the local government pumping information and activities towards a broad audience. Besides that, the initiative showed the importance of information to travel behaviour change initiatives. The available routes helped the participants in the decisions of change to more sustainable modes. The group activities and the encounter to travel together supported the changes (BeHealthyRVA, 2008; City of Portland).

2.3.3 School Travel Plans (STP)

School Travel Plans are a range of plans that seek to change the mobility behaviour of students, parents, and schools' employees on trips to schools. There are several examples of plans with this

characteristic and all of them have the primary goal to reduce the use of cars among the participants traveling to schools. These plans also intend to raise awareness about sustainable mobility and to increase people's perception of improvements in quality of life and health when introducing soft modes into their daily routine. Those projects use education to boost the importance of changing transport habits for personal health and the environment, since a child's early years allows this awareness to have a significant chance of affecting children throughout their lives. This forms a generation more aware of their modal choices (Mobiel, 2017).

Table 1. Initiative's summary. Source: authors.

Project	**Lessons learnt**
Travel Blending	Step-by-step program; Not a push communication.
Portland SmartTrips	Routes' information available to anyone on internet; Activities to promote walking and cycling.
School Travel Plans (STP)	Target group: students; Small activities to engage the participants.

3 Measure Design

The re-Route program is a Personalized Travel Planning initiative aimed at the temporary residents of Porto that are already, or willing to, walk in their commutes. We encourage the participants to explore the city, discover better routes to their daily destinations, acknowledge places in their neighbourhoods, observe the constructed environment and reflect upon the act of walk as a decision rather than a last resource option.

The program's main goal is to incentive the participants to adopt walking as a genuine travel mode through the exploration of alternative travel routes. The initiative is composed of two strategies with a personalized experience. The first one is an aid program for participants to search for better or different walking routes for their respective destinies. Every participant receives one or more alternative paths according to their needs and availability. The second strategy is to disseminate information regarding the benefits of walking. During the one-week duration of the program, the participants will receive daily pieces of information in a friendly format.

Mobile apps allow one-on-one communication with the participants in both strategies, which is crucial to the personalized experience. The messages, routes, and information shared were previously customized to serve the distinct necessities of each participant. For example, the messages to be sent always include the names of the participants. This strategy is used to increase the commitment of the participants.

3.1 Implementation of the Measure

The experiment was conducted in the city of Porto, Portugal. In the city, there is a broad community of temporary resident students. Being in a compact city, the University of Porto possesses campuses near either the historical centre or to some of the residential neighbourhoods of the city. This context provides an opportunity for many international students to live within a walkable distance from most of their classes and still enjoy a thriving urban environment.

Our experiment targeted students at the University of Porto living temporarily in the city (see a summary diagram in Figure 1). The students were contacted by e-mail in which they received a brief explanation of the program, a quick survey, and an invitation to take part. We received 104 answers, which lessened to 40 volunteers once they acknowledge the entire program. This initial group of 40 volunteers was reduced to 15 participants that matched the following criteria:

1. To hold a place of residence in the municipality of Porto.
2. To live in a range of 45 - 50 minutes of walking distance from their respective classes.

To reward the selected participants, we offered them a Brazilian-homemade-candy "Brigadeiro" as a reward upon finishing the program.

The initial strategy intended to encourage and aid the participants to explore their path options. We collected information regarding their routines, their current paths, and their needs concerning their daily travels. Through a survey, we asked the participants to explain why they chose to walk and to set, from a pre-established list, their priorities while deciding their preferred paths to commute. In the same survey, we collected answers to establish an initial base of their attitude regarding their impressions of walking as a mode of travel.

The participants were requested to send us their current paths through the "Just draw it!" application (Figure 2). The application was selected by the following criteria:

1. Full compatibility with iOS and Android systems;
2. The capability of creating and share paths throughout the city;
3. Friendly interface;
4. Easiness of use;
5. Being capable of properly store and share multiple paths at the same time. This option was available only in the paid version and was particularly useful to organize the received routes and the pathways created for the experiment in conformity with each participant.

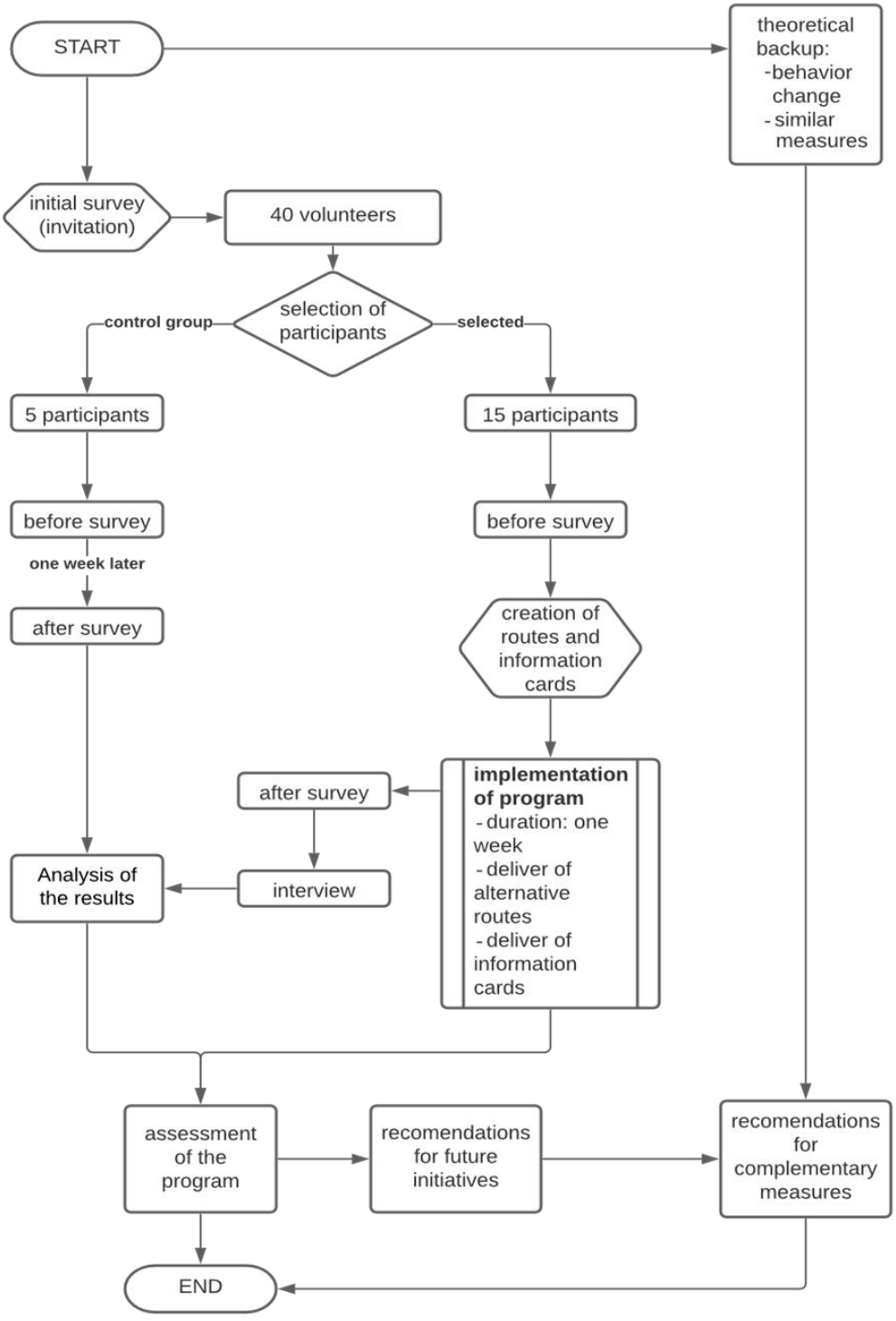

Figure 1. Diagram: implementation of the measure. Source: authors.

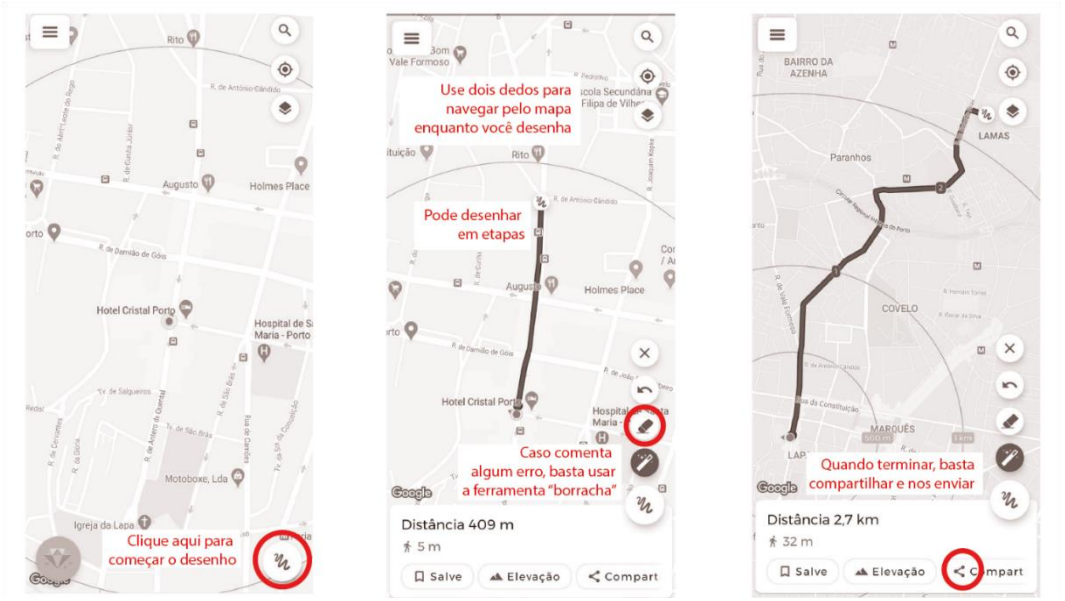

Figure *2* - Tutorial that was given to the participants. Source: authors.

With the information collected, we created routes for the participants following their needs and the requirements set in the survey. We had previously explored the general area of the work (Paranhos, Cedofeita e Santo Idelfonso) and we were familiarized with the characteristics of most of the streets. We previously visited roughly 70% of the proposed routes. For the creation of the rest of the paths, we used applications such as Google Earth and Google Street View (see Chart 1).

<table>
<tr><th colspan="2">Participant 01</th></tr>
<tr><td> 

Route provided by the participant.</td><td> 

1st option – “Exploratory route, you can visit other places in the city”.</td></tr>
<tr><td> 

2nd option – “This is a faster route than the one you already made”.</td><td> 

3rd option – “You can pass through a park and take a time to rest”.</td></tr>
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Chart 1. An example of a participant's routes. All the 15 volunteers received their routes on the app.

Source: authors.

Participants that would travel five times per week received 5 different routes, participants that would travel four times received 4 distinct routes, and so on. The routes were made thematically following the priorities that each participant listed: participants that prioritized travel time and comfort, for example, received a quick path route, and a route with broader sidewalks and fewer road crossings. Participants that previously presented enthusiasm to walk as leisure also received exploratory routes. We designed these routes to take longer times and instructed the participants to take them after their appointments, which was usually on their way home.

Similarly, to the Travel Blending initiative, we asked the participants to plan and use the available routes in accordance with their schedules. For example, if they needed to buy groceries, they should take advantage of routes that passed through commercial streets to make the maximum number of operations in one trip.

During the week of implementation, the participants received their respective routes, with each theme highlighted and daily messages with information and encouragement concerning the act of walk (Figures 3 and 4). It is important to remark that during the week the weather in Porto was nice and the temperatures remained pleasant.

At the end of the program, we asked the participants to answer a new survey to compare to the original one. The surveys were structured around statements that offered a range of five responses: Strongly Disagree, Disagree, Indifferent, Agree and Strongly Agree. We organized the collected data at individual tables for each participant. And then we divided them into two major groups: people with a positive attitude and people with a negative attitude towards walking. We compared the results of the surveys in a before and after instance and discarded minor changes in the responses as normal fluctuations, since the control group that did not take part in the program also presented minor changes during the week. We considered only big variations (shifts in two or more points on the scale of 5) as changes caused by the experiment. Additionally, the participants were asked to participate

Figure 3 and 4. Example of two motivators cards. Source: authors

in an interview and talk about their experience within the program and their plans and perceptions of walking as a mode of commute in their home cities.

4 Results and Discussion

To evaluate the experimental initiative, we compared the surveys done before the program, and the one completed after the program, furthermore we interviewed each participant after the program's implementation. The first survey pointed that 52% of the students live in Paranhos neighbourhood; just 16% of them use private vehicles to commute; and almost all of them choose their paths based on the shortest distance possible. The other surveys contained questions regarding their routines, personal preferences, attitudes toward walking, and the quality of the infrastructure in their current routes to college. During the interviews, we asked them about the overall experiment, their previous experiences with cars in their hometowns, their future intentions concerning choice of mode of travel, and their interest in engaging in similar programs in the future.

The participants were not able to see themselves living without a car in their hometown in the foreseeable future. The reasons given ranged from the inadequacy of the walking infrastructure in their countries to the comfort, safety, and versatility that cars provided. Some participants that presented the intention or desire to purchase an automobile in an extended residency in Porto did not change their minds after participating in the initiative. That reflects the founds of Stein and Rodrigues da Silva (2018) that showed that one of the primary barriers to people use different modes is car ownership. In addition, this reflects the conclusions of (Chatterjee et al., 2013) that people that recently experienced contextual changes are more eager to try new experiences since most participants were car owners in their home countries.

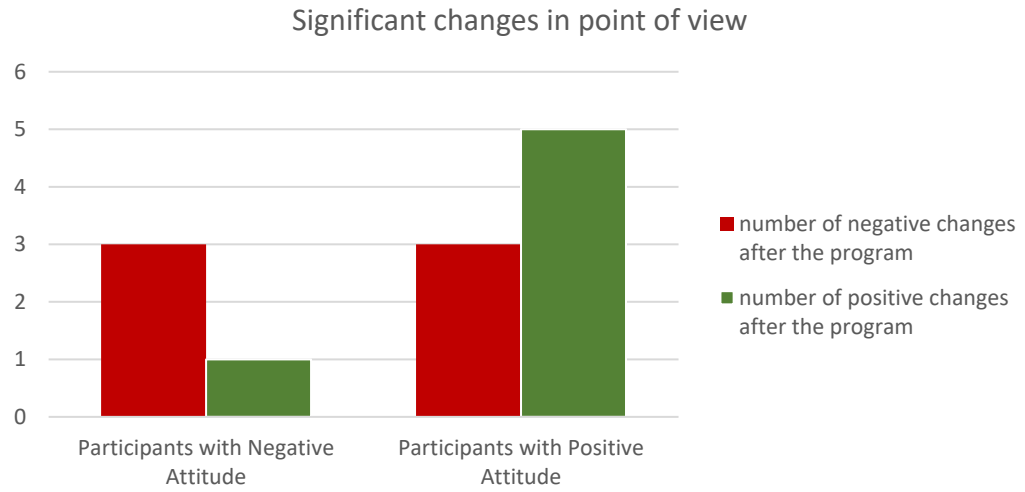

Chart 2. The chart illustrates the number of significant changes (2 or more instances in the scale of 5). Source: authors.

In a more general manner, the participants' attitudes seem to have affected considerably the results of the experience. For instance, participants that answered more positively in the first questionnaire

presented a boost in positivity in the second survey and the interviews. In the first survey, all the participants evaluated the walking infrastructure (in questions about comfort, safety, accessibility, and signage) of their paths as inadequate. Following the end of the program, the participants with a positive attitude presented a slightly improved opinion of the alternative routes in comparison with the original survey (see Chart 2). These same participants presented considerable satisfaction with the exploratory routes and exhibited a higher enthusiasm for the possibility of taking part in similar programs.

On the other hand, participants with a negative attitude intensified their negative opinions about the infrastructure of the routes in comparison with their original option. This could be because of particularities in the vicinities and paths of each participant. Four participants that belonged in the negative-attitude group live in Paranhos and took similar routes before and during the experiment. However, we were not able to find similar examples in the analysed group to carry out this assumption. For example, participants number 2 and number 13 that live in the same street, close to Praça do Marquês, and experienced similar routes presented opposed attitudes. The same is true for participants 5 and 10 that live in the same area of the Bonfim neighbourhood (see Chart 4). Another explanation for the differences in attitudes could be because of the differences in the participants' personalities.

When analyzed as one group, the global opinion of participants (Chart 3) regarding the quality of the paths' infrastructure gotten worse after the program. One reason for this could be because of our lack of knowledge for the creation of paths, as non-natives of the city of Porto, may have influenced the quality of the program. Considering that we could not find a correlation between the opinions of the participants and the routes we have visited and the ones we have not. Furthermore, the studied areas (Paranhos, Cedofeita, and Santo Idelfonso) are shaped by large blocks and, therefore, offer a limited variety of paths. For this reason, most of the participants experienced all, or most, of the practicable routes to their destinations during the experiment.

The program seems to be more successful with participants that lived closer to their destinations, as presented in Chart 5. However, these results should be observed with caution due to the reduced number of participants in the program. Moreover, the different numbers of participants in each group contribute to distortions in the comparison. For example, in the category of fewer than 1,5km, there were only two participants, which means that the individual results of these participants bear a greater weight than in the 1,6 to 2,5km that has a total of six participants. While looking at the numbers in relation to gender, the same considerations about the small number of participants should be taken. Among women, the number of negative answers decreased giving place to a more pronounced number of neutral answers. Among men, the number of positive answers presented only a small variation, but the number of neutral answers decreased while the number of negative answers increased (see Chart 6). This last phenomenon could be explained by the changes in perception after the program and the rise in awareness of the low quality of infrastructure available in the paths.

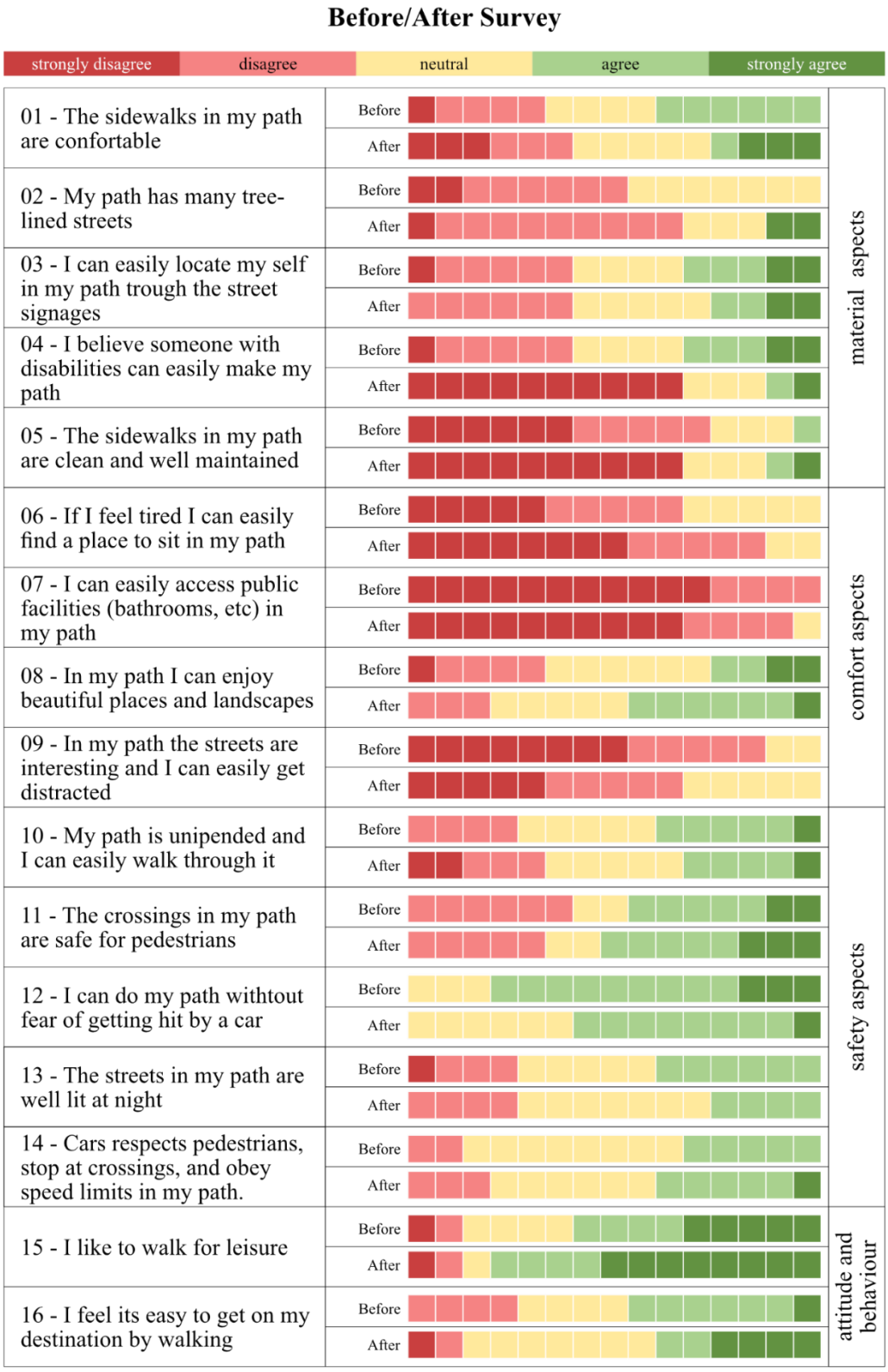

Chart 3. Before and After Survey results. Source: authors

After the program, ten participants of the initial fifteen decided to grant interviews. The participants stated that the program sparked their interest in observing the city and knowing better the surroundings of their homes, such as shops or distinctive streets. Two participants explained that the alternative routes were useful in specific scenarios and that they intended to make them in the future. All interviewed participants presented complaints regarding the material aspects of the infrastructure and stated that the width of the sidewalks was one of the main barriers for them while walking. Three participants complained expressly about the slope of the streets. All the participants declared that they intended to utilize cars upon returning to their hometowns. When it came to prolong their residence in Porto, only one revealed a desire to buy a car in any circumstances, while the remainder considered the possibility of stay walking with predetermined conditions such as the neighbourhoods of their residence.

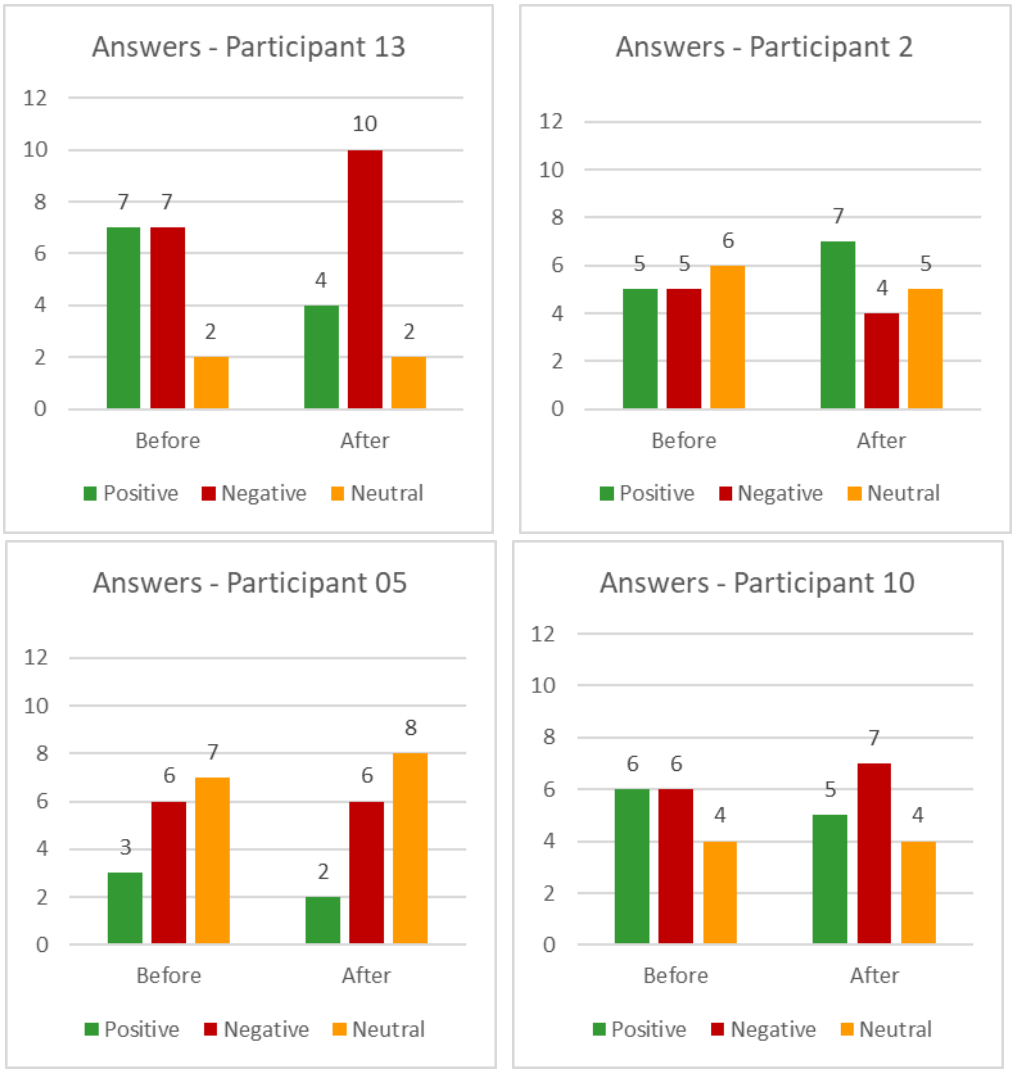

Chart 4. Comparison: participants 2 / 13 and 5/10. Source: authors

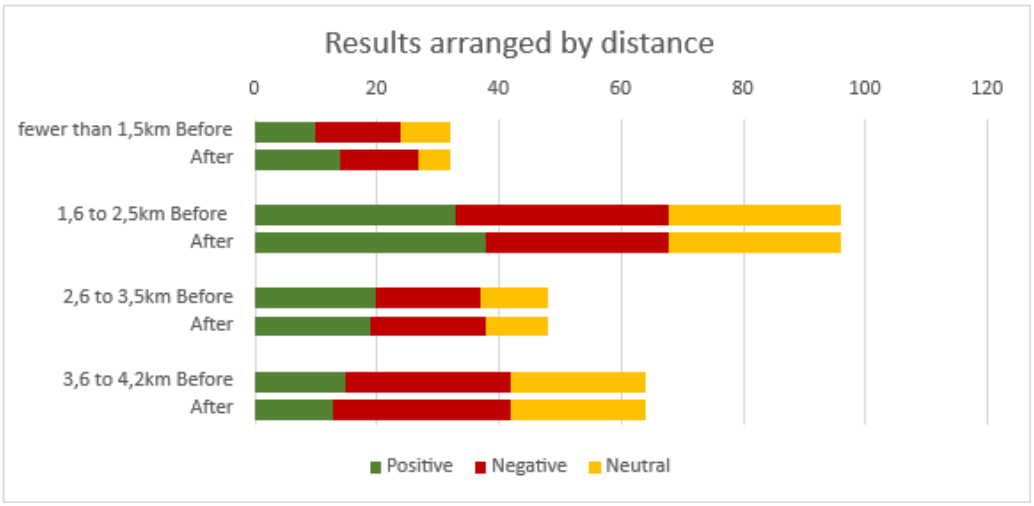

Chart 5. Results by distance. Source: Authors

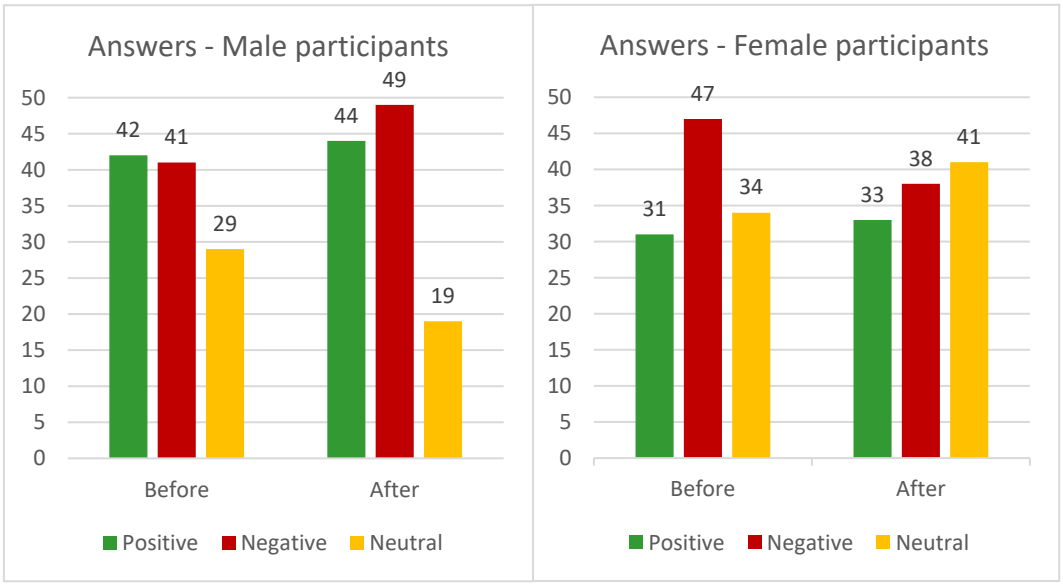

Chart 6. Results by gender. Source: Authors

5 Conclusions

The re-Route initiative in its current design presented favourable results with participants that already had a positive attitude towards the act of walk. Such participants were keen to explore the city and experience as many paths as possible. They presented sympathetic responses to the information cards and even shared them with non-participants.

We consider the information cards a general success. Even among those with a negative attitude, they referred to the cards as a motivation to take the recommended paths. Among remarkable, participant number 1 stated that he tried the advice of the card about walking to lose sleep and was

happy to find out it worked, while participant number 8 told us that the cards made him think more about walking and served as an instigator to do the journeys in the program and the participant number 2 said that the act of share the cards in the social media served as a motivation to him walk more.

The results of the exploratory aspect of the program surprised us. Most of the participants spontaneously complemented the exploration facet during the implementation week. Ten of the fifteen participants were happy to do longer routes, however, the other five were very reluctant to even think about making longer trips. The participants reported their founds in many forms. They talked about shops close to their homes that they didn't know. Some were happy to discover more quiet streets, while others were happy to walk through more dynamic paths. Participant number 9 reported that he liked so much of the paths that he planned to incorporate the routes in his repertoire of trips. The entire aspect of discovery and exploration of the city revealed the potential to become its own kind of program.

Another program's success was to stimulate and engage people in the activities proposed. The participants that disagreed with the longer routes proposed completed the activities with alternative paths. Only participant number 12 declared its disapproval of the program, who was among the ones we could not interview. Despite that, he presented at least two considerable positive changes in the results regarding the paths he took: the quality of the landscape and obstructed sidewalks. In the end, all interviewed participants were keen to take part in a similar program. Even the ones that did not like to walk showed interest in participating in programs that included other modes such as bicycles and public transport.

One mixed aspect of the program was the choice of the city of Porto. The judgment of the participants reiterated the poor walking infrastructure of the city. Participants most complained about the sidewalk's width, street inclination, and the oppressive omnipresence of cars. Besides this, from the point of view of the creator of the program, it was hard to create different paths in a city with massive blocks. On the other hand, the city displayed an assortment of opportunities. The participants committed to exploring found themselves in a city with a vast range of activities on the street level, a good variation of buildings with distinctive facades, and different scenarios depending on the neighbourhoods they passed through. This scenario helped the pedestrians with distractions and amenities, turning their walks less monotonous. Finally, participants originated from colder countries praised the weather of the city.

Besides our efforts to create a personalized program, we believed we failed in delivering a program that adapted according to the needs of each participant. The poor response given by negative-attitude participants reveals this. They were not able to engage fully in the program and their attitude got worse or remained unchanged. The program could have focused only on people that already like to walk or have a generally positive attitude with the objective of increase the overall satisfaction towards walking and the convenience of route choice. On the other hand, if the intended goals would be to raise awareness or encourage walking a better effort in delivering a personalized program adapted to negative-attitude participants is crucial.

We believe that for this kind of initiative, the duration of one week was not enough for it to reach its full potential. In a general way, the participants engaged in the program and performed the minimum goals set by the organizers. Nonetheless, we were not able to observe if the proposed routes could become part of their commute. The participants did not have the necessary time to test and explore the paths from themselves at a more convenient pace.

With consideration of the external barriers to success listed by Davies (2012), we found some similarities with our own experience. For once, the participants directed their general complaints towards infrastructure problems of the city. And we agree these programs should associate themselves as complementary measures of a more robust body of hard measures. The negative perception of walking was also one significant problem because some participants were reluctant from the start to even try different routes because they believed that was impossible to have any kind of improvement in their commute.

Objectively, the program failed to deliver its primary purpose. After completing the program, most of the participants displayed the intention to use an automobile as their main transportation option. Only three participants revealed plans of stay walking as their main commute mode if conditions such as continue to live in Porto or move from a town with better infrastructure were attended. These three participants were already eager to adopt walking as their main travel mode and the participation in the program merely triggered their already existent aspirations. In a broader sense, the program was successful in engaging people, giving them an opportunity to think about their role in the city has travellers and the responses the city should give to make the life of walking commuters more comfortable. As a pilot program, the accomplishments of the initiative are undeniable. We completed all the minor goals related to the structure and implementation of the project. The production of data and relevant information to future initiatives was noteworthy. And the exploration feature of the program was a pleased surprise.

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Chain of factors influencing the modal share of pedestrian mobility

Cristina López, Imre Keseru, Cathy Macharis
Affiliation: Transport Research Centre –TRANSyT-. Universidad Politécnica Madrid (Spain)
e-mail: cristina.lopez@upm.es

Planning cities at human scale is the key to achieve liveable, safe, sustainable, inclusive, and healthy urban environments. Despite walking as a universal transport mode plays a crucial role for the above-mentioned issues, limited attention has been paid to comprehensively understanding the factors encouraging walking and how those factors operate at the urban level. To address that challenge, the present research aims to identify multiple factors determining walking mobility at the city level. The research design is based on a systematic literature review of academic articles. The content analysis distils factors impacting on: (i) pedestrians as an individual; (ii) places where people walk; (iii) infrastructure for walking.
The obtained results display a novel Holistic Interaction Diagram and Interaction Matrix that show the chain of reviewed factors influencing walking at the city level. This facilitates the exploration of alternative mobility narratives, focused on reflecting on synergies between factors and its potentiality for policymaking. Furthermore, the research also explores new pathways of intervention, together with a reflection on the most adequate planning scale and timely for each reviewed factor. The paper closes with concluding remarks on the need for using holistic approaches in determining successful factors for planning cities at human scale.

Keywords: pedestrian mobility, walking modal share, sustainable mobility, urban planning.

1 Introduction

Walking is the wealthiest and fairest, healthiest, safest, strongest, smartest, and greenest form of transport (Government of Scotland, 2014). Since Walking is part of the daily life of most people, that is why it is often taken for granted. Furthermore, people walk for health to get fit and feel good (City of London, 2018), and during the Covid-19 pandemic, to feel safety for the perception of fear of using collective modes. On the contrary, physical inactivity is responsible for over 5 million deaths annually through its effects on multiple diseases—such as heart disease, stroke, cancer, etc.— (Sallis et al., 2016) and it is the second biggest cause of global mortality (Government Scotland, 2014).

Indeed, 63% of all urban trips are less than 5 km in length (ITF, b, 2018). Thus, it opens a great opportunity to encourage walking in urban areas, since pedestrian mobility implicates highly competitive travel time over short distances. Likewise, slightly more than two-thirds of Europeans walk every day (68%) while half use a car every day (50%). However, roughly one in ten Europeans (12%) never uses a car (European Commission, 2013). The weight of the pedestrian mode in many cities is not to be underestimated: in central Paris, the walking modal share is 47%, followed by

Barcelona with 44%, New York City with 39%, Mumbai with 33%, London with 32%, Madrid with 30%, Berlin with 29%, Vienna with 27% and Shanghai with 27% (ITF, 2017).

The study of pedestrian mobility, considered as one of the four modes of transport (public transport, car /motorcycle, and bicycle), is difficult to address since it is challenging to explain the pedestrian behaviour and the interactions between urban structure, mobility habits, and other factors (Krizek, 2000). It is often overlooked when measuring transport behaviour for the purposes of planning. (ITF,2017).

The present research aims to explore alternative narratives of mobility with a holistic planning approach, considering the different types of factors that characterise pedestrian mobility, exploring the various interactions between them and the influence that exert on walking modal share, forward to develop new strategies for policy makers and to contemplate new pathways of intervention.

To address this objective, this paper attempts to answer the research questions: **W*hat are the factors that influence the walking modal share?*** *And later,* ***A holistic view on the factors that exert influence on walking modal share will make it possible to raise new ideas on policy making?***

This paper is organized as follows: **Section 2** begins with the contextualization and the selection of the factors that influence pedestrian mobility in the literature. **Section 3** continues with the explanation of the methodology that it will be developed in Section **4.** It starts with the proposal of factors influencing pedestrian mobility under a holistic view. Secondly, it will analyse the various interactions between them, based on the literature review. **Section 5** shows the results synthetized in what we have called 'Holistic Interaction Diagram' (HID) and the 'Interaction Matrix', which display the flow of relationships between factors. The final section provides the paper's conclusions and offers thoughts on how detecting a chain of factors can affect policy performance, and at the same time, contributing to identify the paths of intervention (the urban planning scale and time scale as well) and where to lead the strategies and actions.

2 Background and context

There are many authors that focus their study on the factors that influence walking modal share in sectorial form (e.g., the review of Badland & Schofield, 2005; Brownson et al., 2009; Forsyth et al., 2008; Saelens & Handy, 2008; Sarkar et al., 2015).

Among the existing literature, the TRB report by Browson et al. (2005) started with a study of all demographics (gender, age, ethnic) and socioeconomic (education, income level) characteristics that influence physical activity (walking and cycling), and the relationship between the built environment and walking and cycling. The analysis of the built environment is a broad concept that many authors include in different factors (Browson et al., 2009; Forsyth et al., 2008; Saelens & Handy, 2008; Badland & Schofield, 2005) such as land use patterns, transportation systems, physical infrastructure, urban design, or urban green spaces (Sarkar et al., 2015).

A study by Pozueta et al. (2007) focused on two groups of variables: urban environmental variables (like density, land use mix, urban morphology) and pedestrian mobility variables (like percentage of

pedestrian trips and number of pedestrian trips per inhabitant). They concluded that it is necessary to identify the key factors in pedestrian mobility and establish the relative importance of each, depending on place (such as Valenzuela and Talavera, 2015) and time, because they find contradictory results among the literature reviewed (i.e., Banister et al., 1997 vs Cervero & Kockelman, 1997 or Guiliano et al., 2006 about density). The studies derived from the PhD of Lamiquiz (2011), confirm that the density and mix of land uses are relevant variables, but he introduces a novel factor 'the configurational accessibility'[1] of the public space network, which has a significant influence on the modal distribution in the neighbourhoods, especially in pedestrian trips.

The study of Krizek et al., (2009) determined in their in-depth review that there are still many questions about which factors foster walking across the individual, interpersonal, environmental, and policy levels. Goodman & Tolley (2003), in turn, believed that there are many factors of different nature that affect the decisions and behaviours of pedestrians, which have been simplified when preparing policies in this regard. Likewise, Hass-Klau (2015) showed that the important factors to promote walking were population density, climate, and other built environment factors such block size complexity, straight or curved streets, street facades, and the existence of trees. Valenzuela & Talavera (2015) performed a literature review on three dimensions — the morphological, environmental, and functional — and focused on the characteristics of the urban environment that most influenced pedestrian mobility: distance, land use, type of sidewalk and the existence of trees. Once again, they insisted that the valuation of the factors cannot be extrapolated, and it is necessary to review on a local scale.

As saying above, most authors work on the influence of one or various factors on pedestrian mobility, but we want to see if a chain of factors —composed by the flow of relationships between them— reinforce the influence of pedestrian mobility and at the same time, shows different ways of intervention on policy making.

3 Methodology

Figure 1 outlines the methodological scheme. The first step is to reach a holistic understanding of the determinants of pedestrian mobility. We begin with identifying in the literature review (searching factors that influence walking) and defining them to set the meaning of each concept, since in some cases it varies from one author to another.

[1] Based on Space Syntax, is a partial quantitative description of the urban form. (Lamíquiz 2011, p398)

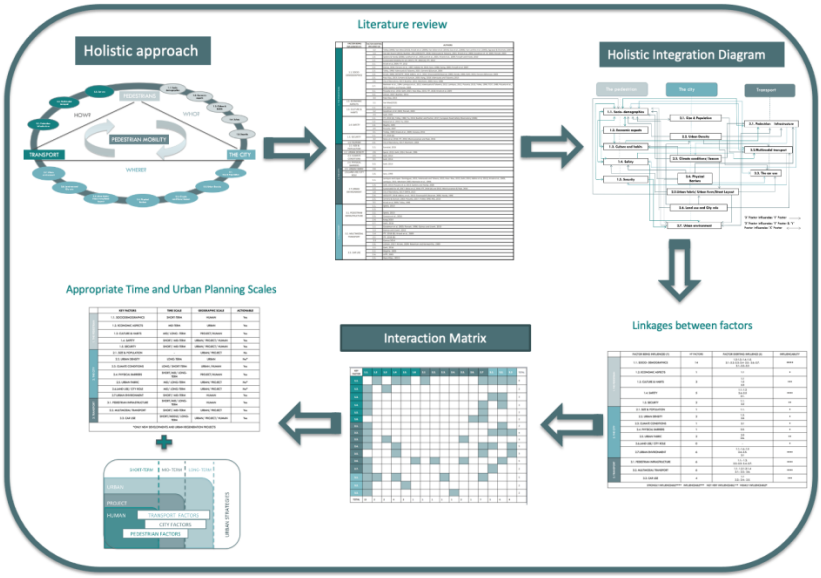

Figure 1. Methodological scheme.

After seeing the different approaches discussed above, in this research, we propose to group them in three perspectives ‘pedestrian’, ‘city’ and ‘transport’.

Once the main factors have been appointed, we will study the interdependencies based on the literature review synthetized in Table 1. The keywords used in the literature search were ‘factors that influence walking’ or ‘walking modal share & each factor. The interlinkages are the result of all connections found in several studies. For example, factor 1.2 influences factor 1.1, regarding the value of travel time in different age groups or household income levels that determine the place to live and consequently the daily travel distance and time, as Tolley (1990), Van Wee (2013), Krizek (2009), Van Acker (2016), and Cao et al. (2006) said.

	FACTOR BEING INFLUENCED (Y)	FACTOR EXERTING INFLUENCE (X)	AUTHORS
1. THE PEDESTRIAN	1.1. SOCIO- DEMOGRAPHICS	1.2	Talley (1990); Van Wee (2013); Krizek et al. (2009); Van Acker et al. (2014); Cao et al., (2006); Van Lerthe et al. (2005); Agrawal & Shcinek, (2007)
		1.3	Van der Hoorn (2013); Buehler, 2011;OECD/ITF, 2018; Valenzuela & Talavera, 2015; Krizek et al, 2009; Goodman et. Al, 2003; Paraah, 2003
		1.4.	Soelens & Handy (2008); Lockhart et al., 2003;Lord et al., 2001; Krizek et al., 2009; Forsyth and Krizek, 2010
		1.5.	Sustainable Mobility for all, (2017); ITF, 2018 (A); ITF, 2012; Cervero and Duncan, 2003; Pikera et al., 2003
		2.1.	Krizek et al, 2009; ITF, 2012; OMM, 2017
		2.2.	Gainza, 2014; Cervero et al., 1997; Habitat III, 2013; Sanz, 1998; Ewing, 2005; Forsyth et al. 2007
		2.3.	Talley, 1990; Valenzuela & Talavera, 2015; Cervero &Duncan, 2003
		2.4.	Krizek, 2009; OECD/ITF, 2018; Adkins, et al., 2012; Greenwald & Boarnet, 2000, Handy, 1996; Gehl, 2015; Cervero &Duncan, 2003
		2.5.	Hass Klau, 2015; Cervero & Duncan, 2003; Kang, 2018; Valenzuela and Talavera, 2015
		2.6.	City of Barcelona, 2017; Buehler, 2011; Manheim, 2003; Sanz, 1998
		2.7.	Niemeier et al., 1994; Lamiquiz et al., 2015; Valenzuela & Talavera, 2015; Lamiquiz, 2011; Pozueta, 2013; Talley, 1990; TEST, 1988; Pozueta et al., 2013; Soelens and Handy, 2008
		3.1.	Pozueta et al., 2013; Gehl, 2015; Hass Klau, 2015; ITF, 2018; Krizek et al, 2009
		3.2.	Litman, 2017; Buehler, 2011;
		3.3	Hass Klau, 2015
	1.2. ECONOMIC ASPECTS	1.1	Van Wee(2013)
	1.3. CULTURE & HABITS	1.1.	ITF, 2012
		1.2	Goodman et Al. 2003; Paraah, 2003
		2.3	Gehl, 2005
	1.4. SAFETY	1.1.	ITF, 2018 (A); Talley, 1990; Martin, 2006; Yu, 2014; Buether and Pucher, 2017; European Road Safety Observatory (2006); Lockhart et al., 2003; Lord et al.,2001
		1.2.	Noland et al., 2013; Yu, 2014
		2.4.	Mapfre, 2005
		2.5	Pozueta, 2007
		3.1.	Talley, 1990 ;Martin, 2006; Krizek et al., 2009; Corazza, 2016
	1.5. SECURITY	1.1.	ITF, 2018 (A)
		3.2	Delso et al, 2018; ITF, 2018; Moniruzzaman and Paéz, 2016
2. THE CITY	2.1. SIZE & POPULATION	1.1.	Eurostat, 2015
	2.2. URBAN DENSITY	2.6	Speck, 2013; Gehl, 2014; Paraah, 1996
	2.3. CLIMATE CONDITIONS	2.5	Gelb, 2014
		3.1	Gehl, 2014
	2.4. PHYSICAL BARRIERS	3.3.	Gehl, 2014
	2.5. URBAN FABRIC	2.6	-
	2.6.LAND USE/ CITY ROLE	1.6.	Sanz, 1998
	2.7.URBAN ENVIRONMENT	1.1.	Lamiquiz and López- Dominguez, 2015; Valenzuela and Talvera, 2015; Hass- Klau, 2015; Gehl, 2014; Adkins et al, 2012; Krizek et al., 2009; Lamiquiz, 2011; Manheim 2003; Niemeier et al., 1994;
		1.4.	Gehl, 2014; Pozueta et al, 2013; Soelens and Handy, 2008
		1.5	Sustainable for all, 2017; Delso et al, 2018; ITF, 2018 (A) and 2012; Moniruzzaman & Paéz, 2016
		2.4.	OECD/ITF, 2018; Adkins, et al., 2012; Greenwald & Boarnet, 2000, Handy, 1996
		2.5.	Cervero & Duncan, 2003; Pozueta, 2017; Trolley 1990; ARL, 2016
		3.1	Krizek et al, 2009; Talley, 1990
3. TRANSPORT	3.1. PEDESTRIAN INFRASTRUCTURE	1.1.	Speck, 2013
		1.3.	-
		2.2.	Speck, 2013
		2.3.	Corazza et al., 2016
		2.4.	Kang 2018
		2.7.	Gehl, 2014
	3.2. MULTIMODAL TRANSPORT	1.1	Goodman et al, 2003; Paraah, 1996; Gainza and Livert, 2013
		1.2	Marquet and Miralles, 2015
		1.3	Gainza and Livert, 2013
		1.4	ITF, 2018 (B); Krizek et al., 2009
		2.1	ITF, 2018 (B); Southworth, 2005
		2.2	Gainza 2014
		2.6.	Litman, 2017; Krizek, 2009; Newman and Kenworthy, 1989
	3.3. CAR USE	1.1	Gehl, 2014
		2.2.	Mapfre, 2005
		2.4.	UITP, 2001
		2.5.	Hass Klau, 2015

Table 1. Literature review. Own development.

These connections will generate a web of flows between factors and form what we have called 'Holistic Interaction Diagram' (HID). As it is a diagram with many arrows that describe the relationships between factors, they are synthetized in a 'table of influenceability' and matrix has been constructed, named it 'Interaction Matrix' (IM), both to facilitate the interpretation of the results.

4 Review of key factors influencing pedestrian mobility

There are multiple factors that influence walking. Once that initially affect the individual, others that depend on the place, and others that influence functional aspects. The first step is to group them under each of the three perspectives (see Figure 2).

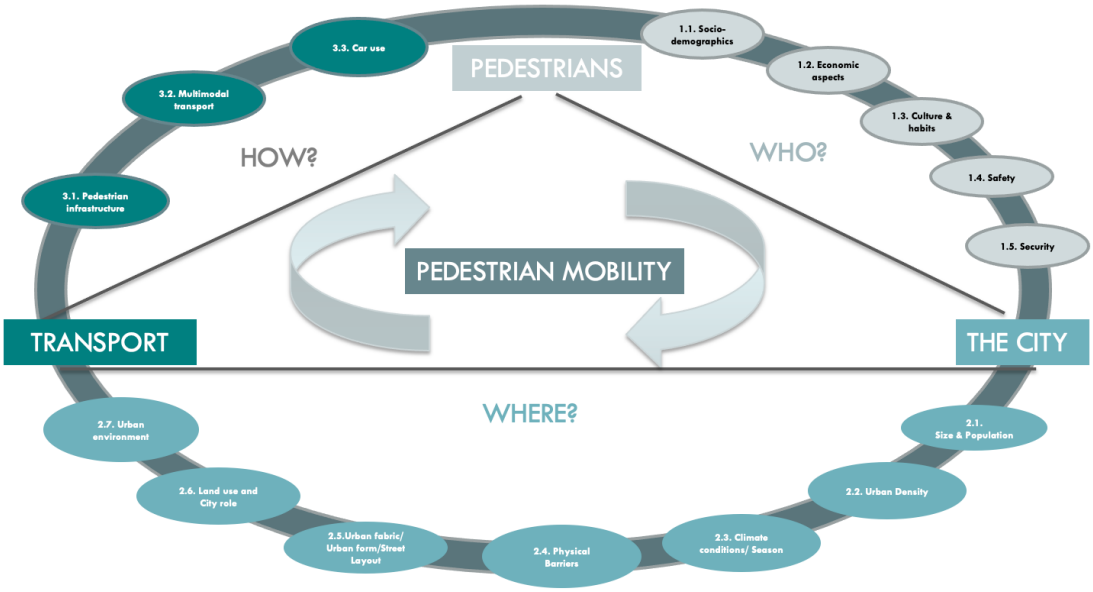

Figure 2. Holistic approach of factors influencing pedestrian mobility. Own development.

4 .1 The pedestrian perspective

4.1.1 Socio-demographics characteristics and attitudes

This factor refers to the socio-demographic determinants (e.g., age, gender, education level, etc.) and attitudes that motivate a person — as an individual — to walk more. The individual decision to walk is not only conditioned by personal needs, but several different factors interfere in personal choices and attitudes (ARL, 2016).

The walking behaviour is very different among age and life-cycle stages (Van der Hoorn & Van Wee, 2013, Pozueta, 2007), gender and between trips for different purposes (Tolley, 1990). It refers to some social groups like children, working mothers, elderly, dependents, etc. tend to have some different mobility patterns that make them more vulnerable (Monheim, R. 2003). At the same time, there are some factors that greatly affect walking to school (Saelens & Handy, 2008), such as pedestrian infrastructure, density, children living nearby (Black et al., 2001) and safety. Safety has a

subjective component since it reflects the perceptions of parents about the safety of children (Krizek et al., 2009; Forysth & Krizek, 2010) and elderly.

Frequently, women patterns of mobility are different because of the superior dedication to the daily tasks of the household and the distance of travel, because of the chain of tasks that they must carry out daily (Dijst et al., 2013). Women move less for work purposes and more for commercial and tasks associated with care. On their journeys, they often combine several modes of transport, while men tend to use exclusively the car.

Mostly elderly people do not drive; they cannot ride a bicycle less if they have not done so before (they are reducing capacity with age, balance, sight, etc.). In the Netherlands, older adults and children walk the most (European Road Safety Observatory, 2006).

On the other hand, education level and household characteristics influence modal split as well (Van Wee, 2013). There are some groups, e.g., students, low-income people, and households without children, that are more sensitive to questions of high pricing of driving or parking or more positive about the benefits of walking for exercise, social interaction, and mental health (Krizek, 2009). Moreover, walking is the cheapest and healthiest way to travel.

In England, people without access to a car make around 50% more walking trips and walk around 50% further than those with access to a car. The England Department of Transport (2018) and Frank et al. (2007) showed in their study that the primary reason for young people to walk is not to own a car.

4.1.2 Economic aspects

This factor comprises features such as income, travel time, and transport costs (in terms of individual expenditure on transport).

Nonmotorized transport is often the dominant mode when public transport services are limited, and income is low. Nonetheless, economic factors (e.g., money) do not directly affect the decision to walk or not. Some studies highlight the relationship that people with low incomes living in disadvantage neighbourhoods walk more for shopping and working and increase the usage of proximity (Marquet and Miralles, 2015). Nevertheless, they do walk less for leisure (Van Lenthe et al., 2005; Agrawal and Shcimek, 2007). Additionally, lower income lowers the choice of places to live regarding the affordability of rent, more than the accessibility of transport. Residential self-selection affects pedestrian behaviour more than travel choice (Cao et al., 2006).

Walking travel time is very competitive over short distances, but competitiveness decreases as distance increases, compared to other modes (Pozueta et al., 2013). The travel time per pedestrian per trip that is acceptable by a person is established between 20 and 30 minutes. However, age influences travel time: elderly people can spend more time travelling than other groups but cannot walk long distances. They usually do short displacements walking more slowly. On the opposite end, young people can walk more but they can spend less time on travel or have different values of travel time (Van Wee, 2013).

As described above, walking is the most affordable mode of transport, because it is not necessary any investment; it is free.

4.1.3 Culture and habits

Culture and habits are not easy to measure. Cultural differences are often related to differing lifestyles (Buehler, 2011; Van Acker et al. (2014), underlining that the influence of lifestyles should be considered because lifestyles themselves can be modified to promote sustainable modes of transport. Krizek et al. (2009) also highlight the importance of preferences and lifestyles on walking share.

In southern European countries, walking 'is part of the lifestyle, which is a basic aspect of daily life' (Lamíquiz, 2011). Pedestrian travel habits are influenced by cultural factors such as societal values (ITF,2012).

In many countries it is a means of transport associated with low income and has a socially 'unsuccessful' image compared to those who use a car (Banister, 2008; Goodman et. Al, 2003; Paroah, 2003), which encompasses a symbol of freedom and mobility. Research by Buehler (2011) comparing Germany and the USA shows that Germans in lower density areas, more limited by mixed land uses and farther from public transport, are more likely to walk (cycle and use public transport) than Americans, living in dense and compact areas and with a mix of land uses of urban development with public transport networks. His study reveals that other contextual factor such as cultural preferences, transport, and land-use policies, and influence travel behaviour more than others like socio-economic, demographic, and spatial development variables.

4.1.4 Safety

Safety in mobility attempts to avoid fatalities, injuries, and crashes in transport. This factor is regarded on how the pedestrian is being protected. Currently, the perception of feeling safe in health against coronavirus could also be added.

However, it is more likely to suffer an accident in the city than on the road. Pedestrians and cyclists suffer the most serious effects. It can be 20-40% of the traffic victims in most countries (Rietveld, 2000). On roads, fatality risks for cycling and walking are, respectively, 7- and 9-times higher risk than for car travel (Sustainable Mobility for all, 2017). Safety concerns, both real and perceived, are a major deterrent to active travel (ALR,2016). Hass-Klau (2015) points out in a study of national accident rates (pedestrians killed) in Norway, Germany, Great Britain, Denmark, Canada, and US. The safest country is Norway. Nevertheless, this does not mean that the walking share is higher in Norway than in other countries. Martin (2006) suggests how can pedestrian behaviour be influenced (i.e., education in road crossing behaviour) to improve safety on streets.

Crossing a street is not the only risk for pedestrians; there is also the risk of falls. This factor is directly related to the type of pedestrian: one out of every three people over 65 suffers a fall per year in a public space (Lockhart et al., 2003; Lord et al., 2001) due to pavements in bad condition: with raised tiles, ramps that do not comply with local ordinances, obstacles on the sidewalks, dog droppings, no

respect for the zebra crossings. In the USA and in Germany, the fatality rate is around twice as high for elderly people as for the overall population (Buelher & Pucher, 2017, b). In UE, the percentage of pedestrian fatalities is about 17% of all traffic fatalities, and the main victims are children under 10 years old and people over 65 years old (European Road Safety Observatory ,2006). Comparing by gender, men killed in traffic accidents are much higher, however, women die twice as much as pedestrians. (ITF, 2018 (a)). Likewise, pedestrian casualties are greater in lower income groups and lower income areas (Noland et al., 2013).

Additionally, Pozueta (2007) shows in a study of Madrid a relationship between urban form and the number of pedestrians run over. In Spain, 40% of victims are struck as a pedestrian; a determining factor is the infringing action of the pedestrian, when crossing through unregulated points. There are more accidents in junctions (Tolley, 1990) than in stretches, except in some cases where pedestrians cross in an incorrect place.

There are other risk elements such as bus stops, subway stations, and proximity to garage exits (Mapfre, 2005) or large vehicles (un)loaded near street corners, removing visibility of the pedestrian crossing. Likewise, Gehl (2014) indicates obstacles like cars, bicycles, or motorcycles parked on the sidewalk also limit the free circulation of pedestrians and affect safety.

4.1. Security

Security is the factor that concerns being free from danger or threat. It is not the same as safety; it focuses on how to protect against deliberate human acts.

There are many cities in the world where people are afraid to walk, and there is evidence that security issues constrain women's mobility (Sustainable Mobility for All, 2017). Indeed, feeling a lack of security tends to be more common in women and most victims are women (ITF, 2018 (a)). It depends on darkness, on where one is, if it is an isolated area and the fear of being attacked. The number of stages of travel, the waiting times of public transport, the work schedule, and the route chosen influence whether one feels secure (Delso et al., 2018; ITF, 2012; Moniruzzaman & Paéz, 2016; Cervero and Duncan, 2003; Pikora et al., 2003).

Additionally, the elderly are the most vulnerable. Many times, they prefer to walk on streets with less pedestrian traffic since they feel afraid of being run over by a baby cart or pushed by another pedestrian. They need places, for example, benches, to stop off at the pedestrian routes. (Krizek et al., 2009).

4.2 The City perspective

4.2.1 Size and population

The bigger the city, the more complex the trajectories and the longer the distance. In Spain, according to the Metropolitan Mobility Observatory data[2] (OMM, 2019), small areas have the highest percentage of walking and cycling, followed by large areas and medium ones, as it can be seen in Table 2, by purpose of the trip (obligatory or non-obligatory mobility)[3] and in the main cities:

	[4]Large areas*			Medium areas**			Small areas***		
	Obligatory	Non-Obligatory	Main city	Obligatory	Non-Obligatory	Main city	Obligatory	Non-Obligatory	Main city
Walking & cycling	22,4	47,5	**49,9**	25,3	47,1	**49,5**	24	54,9	**51,9**
Public Transport	19	18	23,1	11	4,7	14,6	9,1	10,4	10,4
Car & motorbike	57,9	34,1	25,8	62	47,2	34,6	66,2	34,2	37,1
Others	1,3	0,9	2,8	1,8	2,7	1,7	1,6	1,7	1

Table 2. Modal share in Spain (2017). Source: OMM, 2017

In the EU, the number of people using public transport to get to work depends on the city size. It is much higher in the largest cities and capital cities than in provincial cities. On the other hand, commuters living in the biggest cities often struggle to walk or cycle to work. On the contrary, in smaller cities it is increasingly common to find a relatively high proportion of journeys to work made walking or cycling (Eurostat, 2016).

Krizek et al. (2009) distinguish in their literature review if the studies refer to large cities, suburban areas, or rural locations. In the Netherlands, as it reflects the study of Rijkswaterstaat (2008), people living in very populated urban areas have the highest average number of daily walking trips per person (0.66 trips), compared with people living in rural areas who had the fewest (0.49 trips) (ITF, 2012) and the share of pedestrian trips is higher in high-density areas (24%) than in rural areas (14%) (Rietveld, 2000).

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[2] The data of the OMM is collected from (size of the source roughly 25 millions of inhabitants): http://www.observatoriomovilidad.es/publicaciones/informes.html

[3] Mobility can be both for obligatory reasons (work and studies) and non-obligatory (shopping, leisure, etc....).

[4] * 7 large metropolitan areas: more than a million of inhabitants

** 7 medium metropolitan areas: more than 500.000 inhabitants

*** 8 small metropolitan areas: less than 500.000 inhabitants

4.2.2 Urban density

Density describes how many people, workers, or built structures occupy a specified land area (UN-Habitat, 2013). Density influences the distance and modes of travel. It is difficult to establish a causal relationship between urban density and pedestrian mobility (Gainza & Etxano, 2014) since cities are in continuous transformation. In the same city you can find compact areas, mostly urban centres, and historical districts, but which have evolved according to a dispersion model with low density.

New urban areas are often dense, with a high level of infrastructure, but there are many big and unattractive urban spaces for people, designed not for remaining but for transit. Frequently, the higher the population density in a city, the more people walk (Forsyth et al., 2008). However, at the same time, there are some cities with low densities that have high shares of walking. Therefore, density is not the most influential factor in promoting walking (Hass-Klau, 2015).

On the contrary, there are a lot of failed actions in pedestrianisation that meant the 'death' of the respective pedestrian-street zones because neither the density of housing nor of pedestrians was high enough (Speck, 2013).

Compact areas can reduce the number of motorized trips and boost the nonmotorized ones (Cervero et al.,1997), especially for non-work trips, and increase physical activity (Marquet and Miralles, 2015). By contrast, sprawl, as the physical pattern of low-density expansion of large urban areas, is one of the major challenges facing urban Europe (EEA, 2006). Sprawl has an "unmistakable and profound influence on travel" and makes public transport services in good condition (frequency, number of lines, etc.) unviable and increase the use of cars. This situation generates the growth of vulnerable population groups that live in the periphery and must travel great distances (UN- Habitat, 2013).

Additionally, the existence of a larger metropolitan area greatly influences the modal shift. Ewing (2005) found a strong correlation between metropolitan development patterns and walking. In Spain, cities with less metropolitan development, the percentages of trips on foot are generally higher (Sanz, 1998). For example, the city of Vitoria-Gasteiz does not have a metropolitan area and it has the highest walking modal share in Spain.

4.2.3 Climate conditions/ Season

Walking involves encountering the outside world and makes us more vulnerable to weather conditions (Tolley, 1990; Valenzuela & Talavera, 2015) compared to other transport modes that often have artificial air conditioning or heating and are more protected.

Oftentimes, low temperatures are considered an obstacle to walking. Rain and strong winds are another factor that influence walking (Hass-Klau, 2015; Cervero et al., 2003; ITF, 2012) and change perceptions of travel safety (Krizek et al., 2009). However, it does not mean that in the rainiest cities, people walk less. For example, Vitoria-Gasteiz is the Spanish city with the highest walking share despite having one of the lowest average temperatures and a high number of days of precipitation.

In Toronto, younger people are more negatively affected by cold temperatures to walk than older age groups (Saneinejad et al., 2012).

However, excessively high temperatures can also make it more difficult (for example, in southern European countries). Large asphalt surfaces in cities absorb heat and raise temperatures more (Gehl, 2014).

In other matters, rain and very cold weather affect the walking speed. Low temperatures stimulate to walk fast. On the contrary, mild temperatures usually to reduce the walking speed. Moreover, bad weather conditions can increase the risk of falling on sidewalks, especially for elderly people (Corazza et al., 2016)

Another factor affecting walking are the seasons throughout the year. Pedestrian demand often decreases during autumn and winter to rise in a weekday in spring (City of Vitoria-Gasteiz, 2014). It is also variable depending on whether it is a working day or weekend because the mobility becomes non obligatory and the individual valuation of time changes.

4.2.4 Physical barriers

Physical barriers are structural elements that obstruct the functionality of the city. They can be natural barriers such as rivers, mountains, maritime fronts, and green spaces or artificial barriers like roads, walls, railway tracks, and communication routes.

Pedestrian routes must be the most direct and continuous. To the extent that the different barriers found in the city interrupt them, it will be a reason for deterring pedestrian mobility.

As highlighted above, not all pedestrians have the same physical conditions and age plays an important role for walking, which is aggravated by steep slopes (Cervero & Duncan, 2003). Stairs and steps are obstacles to be avoided as much as possible and to be replaced by ramps and lifts (Gehl, 2014).

Travel distance or 'perceived distance' is a real barrier for walking (Krizek, 2009). Travel distance is one of the key factors influencing the choice of walking (ITF, 2018; Adkins et al., 2012; Greenwald & Boarnet, 2001; Handy, 1996). However, it is difficult to determine what is the acceptable distance to walk because the travel distance is also dependent on the age, physical conditions, the state of the pavement, the weather, and urban environment, but mainly on the size of the urban centre, and if they find the equipment and services of the city less than one kilometre away (Gehl, 2014).

Traffic volume and air pollution negatively influences the walking mobility (Xiao and Wei, 2021). By 21% of Londoners say too much traffic is a barrier to walking (City of London, 2018).

4.2.5 Urban fabric/Urban form/Street layout

This factor refers to the configuration and urban structure formed by the streets. The relationship between transport and urban structure is particularly important at a time of unprecedented urban expansion. (Cervero & Duncan, 2003) highlight that urban design influences the choice of walk: curved and cul-de sac street layouts discourage walking (Hass-Klau, 2015). On the contrary, well-connected streets, mixed land use, and small blocks favour short distances and walking.

The demand of pedestrian mobility is in most cases a consequence of models of urban structure (Pozueta, 2007). Goodman et al. (2003) defines the 'City of short trips' as compact, mobile, and

urban. A compact development may not be congestive. On the contrary, the diffused city is not only more expensive and consumes much more energy, but also discriminates against those who do not drive. It also hinders social relationships (Gainza & Etxano, 2014).

As Buchanan (1973) said, *'the conflict between cities and transit obviously derives from the physical structure of those'*. The urban structure and its subsequent transformation by planning have a great influence on human behaviour and the way that city's function (Gehl, 2014).

Large block sizes correspond to less permeable cities, which lengthen the routes by reducing the radius of action of walking, while shorter blocks facilitate shorter routes (Pozueta et al., 2013) and more opportunities to cross roadways are associated with more walking (ALR, 2016).

Recent research is focusing on the relationship between street design components like street environment, amenities, and street density, and how street layouts influence walking behaviour (Kang, 2018; Valenzuela & Talavera, 2015). Good urban structure can mitigate the adverse effects of climate conditions in some cities with strong winds and heavy rainfall (Gehl, 2014).

4.2.6 Land use and city role

This factor considers the segregation, or the mix of land uses and reflects on the functions or specialization of the city. In last decades, the design of the city, the public space, and the location of activities have been done with a car-centric planning, which has resulted in a greater consumption of land and energy, causing problems in the environment and inaccessibility to many sectors of citizenship. Some urban planners focus their interest on density but forget to change diversity and design (Cervero & Kockelman, 1997).

This is so called 'proximity urbanism', which creates proximity and autonomy. Proximity to employment is the variable that most influences travel distance and modal choice, rather than the existence of commerce and services in the residential area (Cervero & Radisch, 1996; Gainza & Etxano, 2014), especially among women (Cerin et al., 2007). Walking varies a lot depending on the trip purpose (Tolley, 1990; Monheim, 1979). Proximity to destination is the element that most positively influences walking as a mode of nonrecreational travel, more than aesthetic quality, infrastructure, or security (Saelens & Handy, 2008; Cervero & Duncan, 2003). Less intensity of urban activity implies a greater use of the car and vice versa (Litman, 2019; Newman & Kenworthy, 1989).

The functions of the city are the activities carried out in it and relating it to the surrounding territory. Some cities have their own role marked by their degree of specialization: there are business cities, university cities, industrial and commercial cities, administrative capitals, and cultural cities. Each specialization has its own mobility pattern. For example, university cities attract a high percentage of young people who will mostly move on foot by bicycle or by public transport. However, business cities attract an adult population, often with financial means or business backgrounds that encourage car use (private or taxis). Lastly, the administrative capital attracts trips from outside the municipality of people who live in one place and work in another.

4.2.7 Urban environment

Urban environments comprise all perceptions, sensations, and impressions that an individual experiences in the public space (it is a different concept than the built environment).

Many authors say that the urban environment has a greater influence on journeys on foot than on other transport modes, for example, on bicycle trips or public transport (Niemeier et al., 1994; Lamíquiz & López- Domínguez, 2015; Valenzuela &Talavera, 2015; Lamíquiz, 2011). However, there are others (Cervero & Duncan, 2003) who think that socioeconomic variables (and others like topography, darkness, and rainfall) have much greater importance than those of the built environment (like urban landscapes). Walking not only depends on the pedestrian facilities (sidewalks and crosswalks) but is also highly dependent on the built environment (Krizek et al., 2009; Adkins et al., 2012). Monotonous and uninteresting scenarios can deter walking on foot. Conversely, attractive, safe, socially animated scenarios stimulate people to walk more (Pozueta et al., 2013; Saelens & Handy, 2008). Indeed, in many cities, creating attractive walking environments has increased retail turnover and pedestrian flow (Tolley, 1990; TEST, 1988).

The facade exerts an influence on the pedestrian (Hass-Klau, 2015) in such a way that if horizontality predominates the building, it will enhance the sensation of distance and remoteness while verticality makes the distance appear shorter and handier. The ground floor of the buildings and their activities can also boost pedestrian flow. (Gehl, 2014).

4.3 Transport perspective

Walking can be used for different purposes (Paroah, 1996): i) as the sole mode to go from one place to another; ii) as a means of reaching other modes, e.g. for going to the metro station, to the bus stop, to a parked car; iii) as a means of using public space e.g. to meet other people or window shopping; iv) as a recreational and leisure medium, like long walks without a specific reason or destination or playing in the streets (tend to be longer).

Most surveys only collect the first and second purposes. Recent evidence shows that the results for walking for travel are different than for walking for recreation (Saelens & Handy, 2008).

4.3.1 Pedestrian infrastructure

This factor is about the facilities making up the pedestrian infrastructure.

Improving the quality of the infrastructure, i.e., to include more footways, provide wider pavements with smoother surfaces, safe crossings, making walking spaces more enjoyable (ITF, 2018), and prohibiting cyclists on pavements has a positive influence on walking (Walcying, EU Project). However, providing more infrastructure may not in itself change behaviour.

Walking routes should be as direct as possible to the destination (Paroah, 1996). Some routes that make many detours and do not follow the straightest path drive the pedestrian. (Gehl, 2014). If the quality of the pedestrian infrastructure is low or it is ill maintained, the pedestrian will change the route or, even worse, will travel on the carriageway (Corazza et al., 2016).

Good walking conditions are considered the following five 'Cs' (Paroah, 1996)**:** i) *Connected:* in a comprehensive network, with short street blocks instead of less permeable large blocks (Pozueta et al., 2013). ii) *Convenient*: with direct routes without detours. iii) *Comfortable*: adequate surface and pavement, enough widths, non-obstacles, with good lighting. iv) *Convivial*: diversity of public spaces to stay and mix of buildings and activities. v) *Conspicuous*: clear routes in terms of design and signing. Krizek et al., 2009, found that density or street design have more effect on walking than the state of pedestrian infrastructure or facilities.

One of the most important measures is to reverse the hierarchy of public spaces (Government of the Basque Country, 2016), to put pedestrians in the first place and bring them the best conditions to walk.

The shape and design of the streets and the richness of the details in the public space influence the quality of the pedestrian routes and can make walking a pleasure. It is different to move down the streets than to just use them (Gehll, 2014).

4.3.2 Multimodal transport

Multimodal transport refers to the use of different modes (or means) of transport along the same journey. Litman (2019) also calls it transport diversity or multimodalism.

Nowadays, the sheer scale of many cities makes a multimodal system necessary, since most of the trips require the combination of several modes (Southworth, 2005). However, *walking is a key element in most multimodal trips* (ITF, 2012) and may be more important than it seems. For example, in the Netherlands, the number of trips of pedestrians (in the context of multimodality, each car trip implies two short-distance walks and a public transport trip needs at least two additional transfers as pedestrians) increases, on average, from 250 to 1600 trips per year and the citizen (Rietveld, 2000). The value of time is often a reason for walking. It is considered as a means of transport that takes a longer time, compared to other mechanized modes (Goodman et al., 2003). The walking speed is also one of the main conditions against other modes, since it varies, under normal conditions, between 4- 5 km/h.

There is no defined average distance to walk. The radius of action of a walking trip, taking as a reference the travel time between 20 and 30 min, is between 1.5-2.5 km. (Pozueta et al., 2013). However, one should distinguish between the air distance or the real one[5], since it will depend on the pedestrian network. Sometimes it is not easy to know the real walking time from one point to another in the city[6].

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[5] The real distance is between 15% and 20% higher compared to the distance in a straight line (Pozueta, 2007)

[6] In several Spanish cities, there is an interesting app ongoing, called 'Metrominuto' (that won the Intermodes Award 2013: http://ok.pontevedra.gal/en/intermodes-2013-eng/) that allow the citizen to know the distance to the main points of the city and the time walking and it provides also additional information as for example the weather. Other European cities have exported this simple model to encourage pedestrian mobility as London, Toulouse, Florence, etc. Another example is the app from Singapore: http://sg.mapometer.com/ or http://www.onemap.sg/index.html

In other matters, walking distance depends on the destination (Paroah, 1996), and the purpose. When mobility is 'non- obligatory' (shopping, leisure, etc.), there is usually more time available and destinations are more susceptible to being chosen because they are closer to the origin (Monzón et al., 2017).

Any increase in transport mode share is because there is a shift to another mode (Paroah, 2003). In most cases, cycling increases at the expense of walking (Krizek et al. 2009); motorised modes at the expense of non-motorised modes and public transport at the expense of private transport (Werner et al., 2003). The challenge is to shift users away from the car. However, Forsyth & Krizek (2010) conclude that 'walking and cycling may complement, but not substitute for auto use'.

In the U.S and Australia, one of the most common purposes for walking in urban areas is walking to and from transit (Krizek, 2009).

Likewise, a critical factor supporting walkability in larger cities is accessibility to public transport for longer trips and it is necessary to improve the connectivity and ease of transfer between modes (ITF, 2018; Krizek et al., 2009) and to see if public transport services can be reached on foot (Paroah, 1996).

Another question to be answered is on 'intermodality spaces'. Is it possible to share the space by different means of transport? Is 'coexistence' between modes a matter of speed? It would be possible, but not under spatial equality conditions (Gehl, 2014; Monheim, 2003) argues that it depends on the volume of car traffic, not above 250 cars/h, or either on the speed of cars between 10km/h and 20km/h.

This is the philosophy behind the 'traffic calming', zone 30 or the 'superblock model'.

4.3.3 The use of cars

This factor focuses on the relationship between the use of the car in public spaces and the conflicts between different modes. The causes that affect modal choice have reviewed in Section 4.1.2.

The increase of vehicles parked on the streets reduces good pedestrian mobility patterns and regarding security (Gehl, 2014). With greater parking in the street, less use of public space.

As Gehl (2014) says, 20 or 30 cars occupy the same surface as a small square. One should add the cars that invade the sidewalk when parking and the pedestrians forced to dodge obstacles. Hass-Klau (2015) points out that car-free or car-restraint streets are an important factor to promote walking. However, in terms of security, as stated before, conflicts between pedestrians and cyclists are increasing, worsened by the proliferation of micro- mobility with electric scooters and segways on the pavements. And, as Kang (2018) shows, there are fewer walkers in streets mixed with cars and bicycles and those that are more sloped.

5 Results

Up to this point, Section 4 has exposed a holistic view and our selection of the key factors that we consider essential when addressing pedestrian mobility.

Each factor is numbered with two numbers: the first one is the perspective and the second one is the number of factors on each perspective: i) For the pedestrian perspective, we have found 5 factors: Socio-demographics, characteristics and attitudes, economic aspects, culture and habits, safety, and security; ii) For the city perspective, 7 factors: Size and population, urban density, climate conditions, physical barriers, urban fabric/urban form/ street layout, land use and city role, and urban environment; iii) For the transport perspective, 3 factors: pedestrian infrastructure, multimodal transport, and the use of cars.

With the evidence found in the literature, the Holistic Interaction Diagram (HID) has been constructed.

5.1 Holistic Interaction Diagram

To lead to seeing those relationships in a graphical form, the following Figure 3 shows the diagram (HID) of arrows that connect a factor 'X' that exerts an influence on another factor being influenced 'Y' and/or vice versa, always based on the evidence found in the literature. The factors are grouped along the three perspectives proposed above: pedestrian, the city and transport.

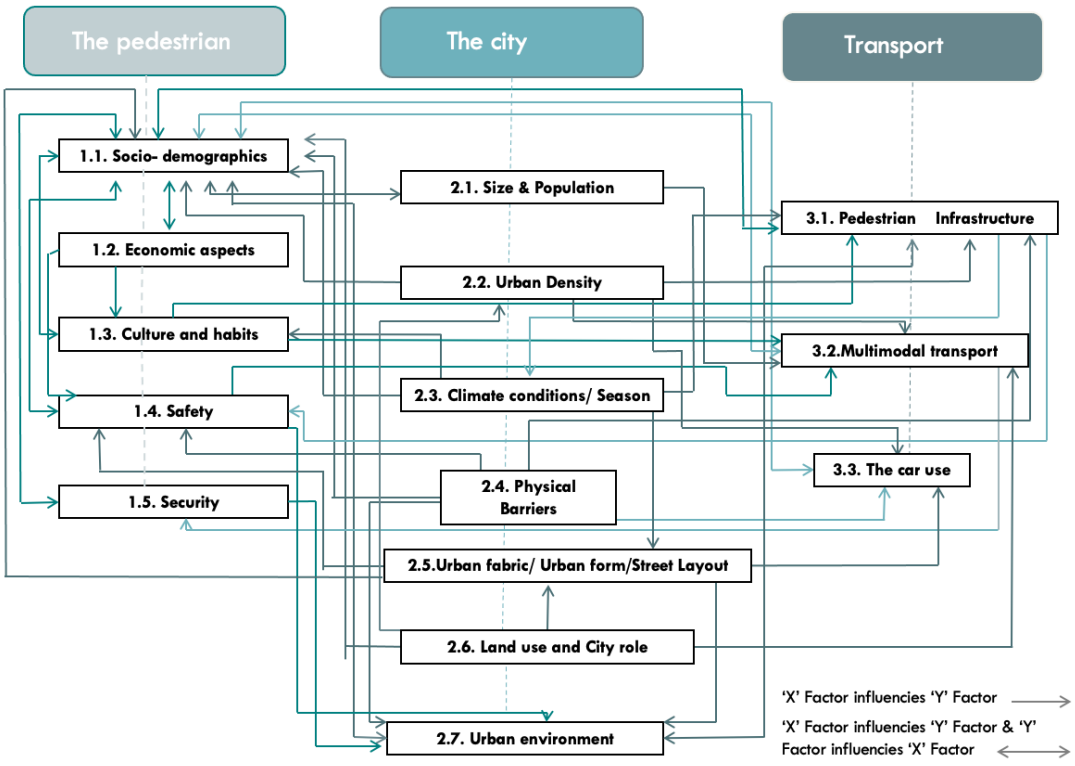

Figure 3. Holistic Interaction Diagram. Own development.

For example, Safety (factor 1.4) is influenced by factors: 1.1-1.2-2.3-2.4-2.5 and 3.1. The fatalities and risk of falls vary by age group, ethnic, gender, or low- income area. In addition, the weather conditions, the existence of physical barriers, the urban form, or the state of the pavements, affect the safety of the pedestrian.

To better understand the interactions between factors, it has also been built the table of influenceability.

Table 3 synthetizes the influence of each factor (X) exerts on other key factors (Y), according to the evidence found in the literature quoted throughout Section 4.

INFLUENCIEABILITY OF FACTORS		FACTOR BEING INFLUENCED (Y)	Nº FACTORS	FACTOR EXERTING INFLUENCE (X)	INFLUENCEABILITY
	1. THE PEDESTRIAN	1.1. SOCIO- DEMOGRAPHICS	14	1.2-1.3.-1.4.-1.5. 2.1.-2.2.-2.3.-2.4- 2.5.- 2.6.-2.7. 3.1.-3.2.-3.3	••••
		1.2. ECONOMIC ASPECTS	1	1.1	•
		1.3. CULTURE & HABITS	3	1.1 1.2 2.3	•••
		1.4. SAFETY	6	1.1.-1.2 2.3-2.4.-2.5 3.1.	••••
		1.5. SECURITY	2	1.1. 3.2	••
	2. THE CITY	2.1. SIZE & POPULATION	1	1.1.	•
		2.2. URBAN DENSITY	2	1.2. 2.6	•
		2.3. CLIMATE CONDITIONS	2	1.1 3.1	•
		2.4. PHYSICAL BARRIERS	1	3.3.	•
		2.5. URBAN FABRIC	2	2.3 2.6.	••
		2.6.LAND USE/ CITY ROLE	0	-	•
		2.7.URBAN ENVIRONMENT	6	1.1.-1.4.-1.5 2.4.-2.5. 3.1	••••
	3. TRANSPORT	3.1. PEDESTRIAN INFRASTRUCTURE	6	1.1.- 1.3. 2.2.-2.3- 2.4.-2.7.	••••
		3.2. MULTIMODAL TRANSPORT	7	1.1- 1.2-1.3-1.4 2.1.- 2.2.- 2.6.	••••
		3.3. CAR USE	4	1.1 2.2.- 2.4.- 2.5.	•••
	STRONGLY INFLUENCEABLE•••• INFLUENCEABLE••• NOT VERY INFLUENCEABLE •• WEAKLY INFLUENCEABLE•				

Table 3. Influenceability of factors. Own development.

The first column has the factors being influenced ‘Y’. The second column quantifies the number of interactions between the factors based on the evidence found in the literature review. Subsequently, the third column shows the factor ‘X’ that exerts influence on factor ‘Y’. Finally, in the fourth column we propose a rating of the influenceability —it means that the most influenceable factor will permit more different routes of action— of each factor along the following criteria: i) Strongly influenceable: if the number of links between the factors is ≥ 5; ii) Influenceable: if the number of links between the factors is ≥ 3; iii) Not very influenceable: if the number of links between the factors is ≥ 2; iv) Weakly influenceable: if the number of links between the factors is ≤1.

The ‘strongly influenceable’ factors (i.e., the factors that have the most interlinkages) are the socio-demographics characteristics (14), followed by multimodal transport (7), urban environment (6), pedestrian infrastructure (6),) and safety (6). In the second place, ‘Influenceable’ factors are car use (4) and culture and habits (3). In the third place, ‘Not very influenceable factors’ are security (2), urban density (2), climate conditions (2), and urban fabric. Finally, the results show that ‘weakly influenceable’ factors are economic aspects (1), size and population (1), and physical barriers (1).

5.2 Interaction matrix

Moreover, factors are influenceable, but at the same time, they exert an influence on other factors. Figure 4 shows the bidirectional flows between factors.

KEY FACTOR	Socio-Demographics	Economic Aspects	Culture & Habits	Safety	Security	Size & Population	Urban Density	Climate Conditions	Physical Barriers	Urban Fabric	Land Use/ City Role	Urban Environment	Pedestrian Infrastructure	Multimodal Transport	Car Use	TOTAL (Y)
Socio- Demographics		■	■	■	■	■		■				■	■	■	■	10
Economic Aspects	■		■	■			■							■		5
Culture & Habits	■												■	■		3
Safety	■											■		■		3
Security	■											■				2
Size & Population	■													■		2
Urban Density	■												■	■	■	4
Climate Conditions	■		■	■									■			4
Physical Barriers	■			■								■	■		■	5
Urban Fabric	■			■								■			■	4
Land Use/ City Role	■						■			■				■		4
Urban Environment	■												■			2
Pedestrian Infrastructure	■			■				■				■				4
Multimodal Transport	■	■			■											2
Car Use	■								■							2
TOTAL (X)	14	2	3	6	2	1	2	2	1	1	0	6	6	7	4	

Figure 4. Interaction matrix. Bidirectional flow between factors. Own development

For example, factor 1.1. exerts the most influence (it has an influence on 10 factors), followed by factors 1.2 and 2.4. (have influence on 5), and factors 2.2., 2.3, 2.5,2.6. and 3.1. (have influence on 4), etc.

Once the interactions between the factors are known, more focus and effectiveness of interventions at urban planning scales can be oriented towards them. Exploring specific actions would go beyond the scope of this paper, but the following example can provide an idea of how the results of this paper can be employed.

For example, if older people (1.1) walk less due to lack of places to stay and security (3.1) on streets or pedestrian routes, it would be necessary to refurbish the area with benches, or to improve the conditions of the pavement and to remove obstacles (1.4-3.1-3.3), it could lead them to walk larger distances, because they know that they have points to rest and they feel more comfortable and safer.

5.3. Potential actions

We define both the likely urban planning scale and the time scale as well as whether the factor can be addressed through actions at all.

5.3.1 Urban planning scale

Following the three urban planning scales recommended by Gehl (2014) to address urban planning and design: i) Urban scale: major scale for global and holistic approaches; ii) Project scale: a medium scale, district or sector of the city, urban space, etc. ; iii) Human scale: the small scale, it is the image of the city that the citizen perceives at eye-level and with walking speed; there are some factors where their influence is major on one scale (e.g., human scale for urban environment, pedestrian infrastructure, microclimate solutions, etc.), while others can be addressed in the three scales, improving the effect (e.g. safety, security, car use, etc). However, Krizek et al., 2009; Valenzuela & Talavera, 2015, recommend small geographical units of analysis in walking.

Conventionally, urban planners address the urban scale first, but the human scale is not frequently addressed. Although in the last ten years, 'tactical urbanism'—short-term action for long-term change (Lydon & García, 2015)— through public space management projects are using human-scale under an experimental, gradual, and socialization logic. The actions are low cost, agile, and put people at the centre.

5.3.2 Time scale:

Table 4 comprises each factor with its urban planning scale of intervention and the time scale proposed. The first column consists of the proposed factors. The second indicates the time scale at which it would be appropriate to act on each factor. The third refers to the urban scale of intervention and the fourth column shows whether it is possible to act directly on this factor.

For example, in the short-term, safety and security features or pedestrian infrastructures can be improved with, i.e., arrangements in pavements or lighting; multimodal transport connections and advances in the urban environment can be modified in the short or mid-term, regarding better conditions for walking. However, there are other actions that require more time.

	KEY FACTORS	TIME SCALE	GEOGRAPHIC SCALE	ACTIONABLE
1. THE PEDESTRIAN	1.1. SOCIODEMOGRAPHICS	SHORT-TERM	HUMAN	Yes
	1.2. ECONOMIC ASPECTS	MID-TERM	URBAN	Yes
	1.3. CULTURE & HABITS	MID/ LONG -TERM	PROJECT/HUMAN	Yes
	1.4. SAFETY	SHORT/ MID-TERM	URBAN/ PROJECT/ HUMAN	Yes
	1.5. SECURITY	SHORT/ MID-TERM	URBAN/ PROJECT/ HUMAN	Yes
2. THE CITY	2.1. SIZE & POPULATION	-	URBAN/ PROJECT	No
	2.2. URBAN DENSITY	LONG-TERM	URBAN	No*
	2.3. CLIMATE CONDITIONS	LONG/ SHORT-TERM	URBAN /HUMAN	Yes
	2.4. PHYSICAL BARRIERS	SHORT/MID/ LONG-TERM	PROJECT/HUMAN	Yes
	2.5. URBAN FABRIC	MID/ LONG-TERM	URBAN/ PROJECT	No*
	2.6.LAND USE/ CITY ROLE	MID/ LONG-TERM	URBAN/ PROJECT	No*
	2.7.URBAN ENVIRONMENT	SHORT/ MID-TERM	HUMAN	Yes
3. TRANSPORT	3.1. PEDESTRIAN INFRASTRUCTURE	SHORT/MID/ LONG-TERM	HUMAN	Yes
	3.2. MULTIMODAL TRANSPORT	SHORT/ MID-TERM	URBAN/ PROJECT	Yes
	3.3. CAR USE	SHORT/MIDDLE/ LONG-TERM	URBAN/ PROJECT/ HUMAN	Yes
*ONLY NEW DEVELOPMENTS AND URBAN REGENERATION PROJECTS				

Table 4. Appropriate time scale and urban planning scale to address the key factors that influence walking share

It is worth highlighting that there are factors that cannot be promoted or changed directly, for example, the case of climate conditions (except for punctual actions like putting canopies for shading the street) in microclimate actions or improvements in landscape gardening (Gehl, 2014); additionally, there are others in which interventions would be costly or less possible to change, for instance the density, street layout, etc. of a consolidated neighbourhood (Hass-Klau, 2015; Forsyth et al., 2008). Urban regeneration or new development in the city is a good opportunity to face changes in some factors (signed with a * in Table 4).

6 Conclusions and Recommendations

Addressing the research question, '*what are the factors that influence in the walking modal share?* Unfortunately, there is no single answer. It is not a matter of determining if one factor is more important than another, since two or more may positively reinforce each other. A factor by itself is not necessarily successful. For instance, high densities do not mean more vital cities. It also depends on the attractiveness of the urban environment and on the quality of the public spaces.

Secondly**, '***A holistic view on the factors that exert influence in walking modal share will make it possible to raise new ideas on policy making?'*

Figure 4 portrays the bidirectional flows of influence between factors. Furthermore, it ranks from the strongest influenceable factor to the weakly influenceable, and on the other hand, from the most

influential to the least influential ones. This way, the policies can be steered towards a modal shift. In this research, the factor that has the most interlinkages is the socio-demographic one. This highlights the importance of the individual and of behavioural attitudes. It is necessary to promote awareness campaigns that encourage modal shift. As Krizek (2009) insist, increasing walking requires behavioural change and the first step is to boost educational programs.

There are some vulnerable groups in pedestrian mobility. Not everyone moves around under the same conditions. People living in the periphery are more vulnerable since they must travel greater distances. The value of proximity is remerging as one of the factors that give a better quality of life and that make it possible to walk. During the 1960s, many city centres were emptied of population that moved to the outer areas of the city, in search of greater environmental quality, less pollution, and noise. However, today, the movement is in the opposite direction, returning to the centre. This is not feasible for everyone since living in the city centre is not affordable for many. In some cities today, walking to work or to shops has become a privilege. On the other hand, women, children, the physically disabled, and the elderly are more exposed than others. Women make greater use of more sustainable means of transport, but they are also more sensitive to security concerns. Children, up to a certain age, cannot walk alone. They need their parents for walking. It is necessary to target each group of people differently to know their behaviour and to go further in policy and strategies.

To make transportation more affordable, it is indispensable to support nonmotorized transport, reduce transport costs, and increase accessibility in public spaces (UN-Habitat 2013). Income influences not so much the use of one mode of transport or another but rather the possibility of choosing one mode or another.

The location of activities and employment is crucial. If they are mostly in the main city, not in the metropolitan area, it is one key reason of high walking modal share. To increase the effectiveness of policies, a thorough understanding of the travel behaviour of people is needed. And the first step relates to road users: pedestrians should have priority rights, followed by public transit, commercial and service vehicles, and lastly private cars, in order (Walk 21, 2016).

How to combine different approaches in interventions (Forsyth and Krizek, 2010) and strategies in pedestrian mobility? It would be advisable to work in the three urban planning scales (urban, project, and human). Moreover, the three perspectives (pedestrian, city, and transport) have a different approach to address, as can be seen in Figure 5.

First, this paper proposes to address urban planning actions from the pedestrian perspective, mainly in the human scale and sometimes at the project scale. However, the urban one should be given less importance. In turn, we suggest that an appropriate time scale for strategies should be set up in the short or middle- term, better than in the long- term.

Secondly, in the city perspective, we think that the changes must occur in different scales. For example, the implementation of a pilot project in a residential area or on a street (short-term/ human scale) is completely different than the pedestrianisation of a historic centre or a large part of its streets (middle or long-term/project or urban scale). Therefore, actions take very different periods of time, it should be necessary to manage a right temporal balance in the time scale.

Finally, in the transport perspective, it is necessary to act at the project scale and in the urban scale. What it needs longer time scales (mid and long- term). Improvements in pedestrian infrastructure or the coordination of multimodal transport actions require more time.

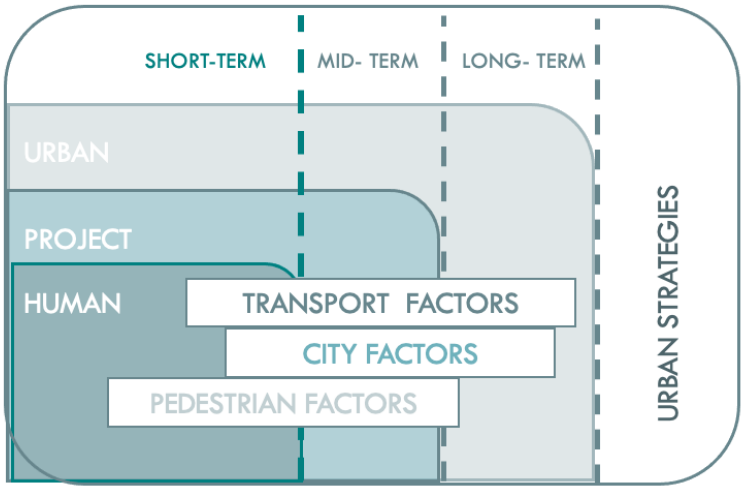

Figure 5. Temporal and urban planning scales. Own development.

Must the results be generalizable? Although there are many cases of best practices and cities with high percentages of walking modal share, it is necessary to make the analysis of transferability, because the factors that influence on the walking modal share in each city are different. It is convenient to identify them and establish the relative importance of each.

To conclude, it can be said that urban mobility is a fundamental right, and making our cities accessible to all, regardless of age, gender, or income is paramount and should be an important societal and policy goal. As Tolley (2015) advocates '*walkers are the indicator species for quality of life*'.

Chain of factors influencing the modal share of pedestrian mobility

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Transformative Planning and the Diffuse Urbanization Territory: Aveleda's Parish Case, Vila do Conde

Daniela Magalhães [1], Miguel Branco-Teixeira [2]
Master in Architecture and Urbanism1, CITTA member and Professor at Fernando Pessoa's University2
E-mail: 30971@ufp.edu.pt1, lbt@ufp.edu.pt2

This article studies the relationship between transformative planning and the territory of diffuse urbanization, using the parish of Aveleda in the municipality of Vila do Conde as a study case.
At first, the awareness about the concept of diffuse and its repercussions is deepened by reading the territory of Aveleda's parish. Considering its origins, demography, built park, infrastructure, and mobility possibilities, the following is a characterization of Aveleda in which the strengths and vulnerabilities are diagnosed with a view to its improvement. In this diagnosis, different perspectives are evidenced through interviews, where the perception of the local population about their territory, and in particular, about the levels of well-being is evaluated.
In this sense, the article essentially addresses two interrelated questions: How to plan in the diffuse territory? Which measures have the greatest potential to contribute to social well-being?
The article seeks to answer these questions by setting a set of challenges, for which it identifies 30 strategic objectives and 70 particular measures that are considered appropriate to the specific conditions of Aveleda's parish rooted in the theoretical and practical premises of diffuse urbanization and well-being.

Keywords: *Aveleda; diffuse urbanization; transformative planning; well-being.*

1 Conceptual Framework

1.1. Diffuse Urbanization

Nuno Portas (2004), understands the domain of diffusion as an "extensive city", stating that this is due to the economic and social changes in the territory. Among the economic reasons, this author highlights the displacement of production and consumer services previously concentrated in a certain point, also highlighting the real estate bubble created by large centres pushing a broader demand. Between the social reasons, Nuno Portas (2004), highlights the "individualization of demand", which unbalances urban increase comparing to demographic growth. The family structure is smaller and more divided and consequently, there is a "low-density demand" that spreads throughout the territory. In the same way, François Ascher (2010) defends an increasingly powerful social individualization where the social bonds are very numerous, highly varied, mediatized, fragile, and specialized. In other words, social relations were multiplied, inside and outside work, on a variable scale (from local to global) and with quick and easy forms of communication, such as telecommunications. Relationships become "much weaker" than in the past and more fragile as well" (Ascher, 2010: 45). In this sense, the territory of the diffuse is "socially and culturally heterogeneous".

Accordingly, Francesco Indovina (2004) adds that it's possible to identify different phases from diffuse urbanization. The first refers to the abandonment of the centre for the establishment in the "urbanized

countryside", which is marked by the search for a better living condition and, especially, related to the "new" housing needs - individualization of demand (Portas, 2004). The second phase is marked by immigration from the "city". A flow that attracts and reinforces the diffuse urbanization processes caused by the (limited) economic possibilities - real estate bubble. The third and last phase of diffuse urbanization is related to the extension of the limits of the "city" where this flow is more identified by a phenomenon of "escape from the city" than by a phenomenon of attraction. Nuno Portas (2004), recognizes this phase as "ex-urban development" characterized by random processes and spontaneity.

This expansion of the accessible territory is due to the progress in mobility that, since the second half of the 19th century, has been "shrinking time" through railways, naval transport and, later in the 20th century, through the automobile, airplane, and wireless communication (Branco-Teixeira, 2007). The road network, in particular, has an essential role in structuring the territory, allowing the dispersion and circulation of people and goods. Francesco Indovina (2004) reinforces this idea, stating that without the car, the diffuse city would not exist because it is the "catalyst" element of the urban expansion of the 20th century.

People are attracted to the diffuse territory because it has become a condition of living, just as "being urban" is, in the sense that the important thing is the ease of being able to be in "several places and at different times simultaneously" (Ascher, 2010: 39). The diffusion of housing stock, services, and facilities has generated a reticular socio-territorial morphology that interconnects different parts of the territory, through its functions, relationships, flows, and dynamics, without any predefined hierarchy of dependence - a reflection of society - being all the elements of the territory connected (Ascher: 2010). The lattice is permanently related to accessibility, which plays a fundamental role in the attractiveness of the diffuse domain, using the various physical and digital infrastructures (Branco-Teixeira, 2007), essential for movement and communication between people. This led to a change in the proximity relationship, allowing the territory to be expanded while looking for the most suitable condition for each person's needs.

1.2. Territorial Competitiveness in the Diffuse Territory

At the end of the last century, Porter (1990) referred to territorial competitiveness as being a need to provide conditions conducive to the development of various activities, the promotion of well-being, and progress. In this context, the author highlights the territorial marketing strategies focused on the quality of local markets, the valorisation of the sense of "place", "gateway" and the use of competitive principles in favour of increasing attractiveness.

Bearing in mind the teachings of Porter (1990) in terms of planning, in the territory of diffuse urbanization, four attributes stand out - identity, attractiveness, connectivity, and strategy - which are essential to increase territorial attractiveness.

The identity has a special focus on history, culture, urban rehabilitation, and territorial marketing; Attractiveness focuses on promoting cultural development, generating new and qualified jobs, controlling and disciplining land uses and promoting diversity; Connectivity focuses on promoting accessibility and mobility; The strategy focuses on cooperation and territorial interdependence in a complementary way and on stimulating network thinking.

In this context, it is worth highlighting the role of public entities (chambers and government) play in the development of measures, in the elaboration and application of urban and spatial planning plans, and in the provision of tax support and incentives, which allows promoting, in a more inclusive these attributes of competitiveness in the diffuse territory.

2 The Territory of the Diffuse on Aveleda's Parish, Vila do Conde

2.1 Territorial Diagnosis

To get to know the study area, a brief territorial diagnosis of the parish of Aveleda was elaborated, mainly focused on the following points: Territorial Surroundings, Demography, Buildings and Infrastructures, and Mobility.

2.1.1 Territorial Surroundings

Aveleda's parish belongs to Vila do Conde's municipality, part of Porto's district, Douro Coast region, in the northern area of Porto's Metropolitan Area. As shown in Figure 1, Vila Do Conde's territory is administratively divided into 21 parishes, where Aveleda is located at the southern end of the municipality, bordering 2 municipalities, in the south the municipality of Matosinhos and east with the municipality of Maia.

Figure 1. Locating Aveleda's parish

2.1.2. Demography

The parish of Aveleda has 1 314 resident inhabitants, spread over 3.7 km2 of total area, resulting in a population density of 355.1 inhabitants / km2 (INE, 2020). Although located on the outskirts of the city of Porto, and benefiting from the metropolitan suburbanization process, between 2001 and 2011, Aveleda lost 165 inhabitants, which represents a significant decrease in its population within a decade.

Table 1. Projection of the resident population in Aveleda's parish until 2031

	2001	2011	2021	2031	Growth rate %
65 or +	202	256	324	411	0,024
25 - 64	818	766	717	672	-0,006
15 - 24	231	133	77	44	-0,054
0 - 14	228	159	111	77	-0,035
Total	1 479	1 314	1 167	1 037	-0,012

As shown in Table 1, in addition to the population loss, there was an increase in the age group 65 or more, which has contributed to the accelerated aging of the resident population.

The increase in the elderly population intensified the pressure on collective facilities, in terms of health and social security, which already affects the sustainability of the social contract (Vila do Conde City Council).

2.1.3 Buildings

The evolution of the building in the parish of Aveleda had a positive variation, between 2001 and 2011, of 3.1%, as can be seen in Table 2. Although, as shown above, the resident population has seen a decrease of 165 inhabitants (11.2%), the number of families residing in Aveleda increased by about 2.5% (see Table 3). This is a reflection of the characteristics presented by the diffuse urbanization, where there are more and more buildings and families scattered throughout the territory but consisting of a smaller number of people.

Table 2. Building's evolution in 2001 and 2011, in Aveleda and in the municipality of Vila do Conde

	Buildings		
	2001	2011	Variation %
Aveleda	448	462	3,1
Vila do Conde	20 422	22 894	12,1

Table 3. Resident population and resident family's evolution in 2001 e 2011, in Aveleda and in municipality of Vila do Conde

	Resident Population			Resident Families		
	2001	2011	Variation %	2001	2011	Variation %
Aveleda	1 479	1 314	-11,2	436	447	2,5
Vila do Conde	74 391	79 533	6,9	27 210	27 210	14,2

Benefiting from great accessibility, an industrial area was recently built carrying new dynamics and flows. Its built-up corps is notorious and is essentially related to the Aveleda / Lavra node of the A28 highway (A28 at 1 km / 2 min; A41 at 4 km / 4 min; Francisco Sá Carneiro Airport 8 km / 7 min).
However, despite the natural improvement in economic activity and the actions caused by the new industrial zone, residents do not consider that it has made a big difference in their daily lives. This means that this "pole" has not been generating transcendent dynamics in Aveleda, falling short of what was expected in terms of the potential for improvement in the local territory.

2.1.4 Infrastructures and Mobility

The connections between Aveleda's parish and the main points of destination outside the municipality were evaluated (see Figure 2), highlighting the connection to the city of Porto, and other urban areas (Leça da Palmeira, Maia, Matosinhos, and Póvoa de Varzim). These are structural links, of a higher hierarchical level, included in the national and regional road network. Likewise, the connections between parishes, associated with Aveleda and its immediate surroundings were acknowledged. Here are included the connections of the parish of Aveleda with the parishes of Labruge and Vilar do Pinheiro (belonging to the municipality of Vila do Conde), with the parish of Lavra (belonging to the municipality of Matosinhos), and with the parish Vila Nova da Telha (belonging to the municipality of Maia). These are local internal connections that make up the local network, with less importance in the hierarchy of the road network. In terms of structural connections, included in the regional and national road network, the following features should be highlighted:
The two main road connections are the A28 highway and the N13 road, both in the North-South direction and which run longitudinally through the municipality of Vila do Conde;

The A28 highway is the main road connection to the parish of Aveleda, with access from the Aveleda-Lavra node. The motorway contains an electronic toll (from € 0.90) between Aveleda and Mindelo (South-North direction). It is the structural axis of the entire region, providing privileged connections with the Porto Metropolitan Area and with the cities of Braga and Viana do Castelo, across the continental coast;

The N13 road, which has a parallel and alternative route to the A28 highway, allows the distribution of municipal and regional traffic, constituting a usual means of access to the county seat and the city of Porto, in addition to the fact that no fee is required to be paid. for its use;

Figure 2. Most used routs and directions

From the centre of the parish, Rua da Aveleda, the N13 road is a 5-minute drive (approximately 2.8 km). The A28 highway is 3 minutes away by car (about 1.5 km).

Regarding the second level of connections, that is, the local network, it appears that the most used roads in the parish are the access roads to the A28 highway and the N13 road (in the parish of Vilar do Pinheiro), coinciding with the access routes to religious facility: Rua do Outeiro and Rua da Agra Nova, Rua da Igreja and Rua da Mota, respectively.

Travel to the municipality of Matosinhos is possible through the two accesses to the parish of Lavra: the southernmost access to Aveleda, following Rua da Agra Nova and passing over the A28 highway to Rua da Cruz (this being the most recent access and what offers better road infrastructure).

From the road infrastructures and their evolution, we can expect that the crossing of the major road A28 and connection to N13, establishes an important asset for the development of the parish of Aveleda. However, the parish has exposed itself as a territory of passage (fast and short), not benefiting in terms of attracting or attaching residents.

The high accessibility of this area must undoubtedly have an impact on better development possibilities, both within the scope of access opportunities for families and jobs and within the framework of the local attraction of economic activities. Still, it will be important to reflect on the plan to be followed to extend the advantages of excellent accessibility visible, for example, in the Industrial Area of Aveleda, to the whole of the shires surrounding the parish (Maia, Matosinhos and Vila do Conde).

Add, in this context of vulnerabilities, the lack of a well-defined hierarchy of the road network, the deficient connections between roads of different hierarchical levels (namely the connections to the N13 road), being necessary to rethink circulation directions and secondary routes which can offer better accessibility for users.

The parish of Aveleda has a Metro station, "Vilar do Pinheiro", which, at present, is not widely used by residents, and measures must be taken to promote its use. This infrastructure that connects Póvoa de Varzim-Estádio do Dragão (Line B) has enormous potential to improve the parish socially and economically.

2.2 Population perception of well-being levels

It was intended to confront the diagnosis of a more objective nature, based on the analysis of quantitative indicators, with the perception – necessarily more subjective – of the quality of life expressed by residents. For this purpose, the analysis previously carried out is complemented, seeking to perceive the opinion of the local population regarding the problems and levels of well-being in their parish.

In methodological terms, interviews were conducted with a universe of 20 individuals of different age groups and professions. This procedure was carried out "in situ", more specifically in the proximity of the parish's religious facilities, during September and October 2020. Succinctly, the interviews essentially identified the following problems:

Local road infrastructure does not adequately respond to needs and needs intervention;

Lack of facilities, services, and public space to support the elderly;

Insufficient and poor-quality public spaces for leisure and rest, namely in terms of parks, squares, gardens, and footpaths;

The deficit in the supply of proximity services, in particular bakeries, patisseries, markets, among others.

2.3 Strengths and vulnerabilities identification

Following the analysis of the territorial characteristics of the parish of Aveleda, carried out by relevant thematic domains, the strengths are highlighted in Table 4 and, in Table 5 the vulnerabilities are presented so that the problems can be subsequently overcome, enhancing synergies that contribute to increasing the attractiveness of Aveleda.

Table 4. Strengths of Aveleda's diffuse territory

Theme	Strengths
Identity	Historical character (mills, hazelnuts, *veteris* route)
Buildings	Isolated dwellings with surrounding patio
	Residential areas (urbanizations)
	Religious heritage in good condition
	Cultural activities (theater)
	River "Botica"
Infrastructures and Mobility	Great Access: Maia, Matosinhos, Póvoa de Varzim, Vila do Conde, Braga, Viana do Castelo
	Parallel path to the A28 motorway, free from taxes, through EN 13
	Transit territory due to the A28 node "Aveleda-Lavra", as na escape from highway taxes
	Metro station "Vilar do Pinheiro"

Table 5. Vulnerabilities of Aveleda's diffuse territory

Theme	Vulnerabilities
Demography	Population loss
	Population longevity/aging
Buildings	Multi-family housing
	Featured elements
	Building with more than 50 years
	Proximity to Francisco Sá Carneiro Airport
	Elderly population dedicated facilities
	Large cargo vehicles (Aveleda's Industrial area)
	Outdated facilities surroundings in non-compliance with people with disabilities
	Services and infrastructures to support youth dynamics
	Sports facilities
	Local commerce
	Private services, companies, specialization offices
Infrastructures and Mobility	Reduced street profile, with two road directions
	Pedestrian paths
	Transit territory and not fixation territory
	Undefined road hierarchy
	Public leisure spaces
	Information on bus timetables and routes
	Maintenance of bus stops
	Low use of the Metro by the population

3 Transformative Planning in Aveleda: 70/30 Proposal

Once the diagnosis has been made and the characteristics – strengths and vulnerabilities – of the parish of Aveleda were presented, it is essential to define how its components and the territory itself should be managed to improve the population's quality of life. The parish of Aveleda, given its diffuse territorial structure, requires a global vision that does not fit in with specific projects. The purpose of the strategy now proposed is to contribute with the presentation of innovative measures that, holistically and inclusively, disseminate new practices in the dynamics of transforming this territory of diffuse urbanization. The strategy has defined 30 goals and 70 measures for the parish of Aveleda, which make it possible to set into action truly transformative planning. The objectives are divided into 4 themes: identity, demography, buildings and infrastructure, and mobility.

Objective 1 - Identity

Objective 1.1. Recognize and enhance the historical heritage of the parish

Qualify and recognize the built heritage – mills/watermills and *Veteris* route – through signs that inform, promote, and contextualize the heritage.

Objective 1.2. Cultivate the tree species that gave rise to the toponym.

Cultivation of Corylus Avellana trees (hazelnut trees) in public green spaces in the parish, identifying the species and its relationship with the territory.

Objective 2 - Demography

Objective 2.1. Attract resident population

Create a park for public use – Aveleira's Park – with pedestrian paths that run along the banks of the Rio da Botica and with areas for rest and leisure;

Ensure proximity services (bakery, kiosk, market, etc.);

Promote low-cost housing.

Objective 2.2. Adapt the territory to the increasing population longevity/aging

Provide all buildings for public/social use with accessibility for people with disabilities;

Provide a vehicle, electric type, that ensures the needs of the elderly (go shopping, access to health and institutional services);

Ensure the existence of facilities, associations, and public space to support the daily lives of the elderly.

Objective 3 - Buildings

Objective 3.1. Promote isolated dwellings with surrounding patios

Requalify and publicize the characteristic housing typology of the parish;

Control diversity of typologies, through the Municipal Master Plan.

Objective 3.2. Qualify residential areas (urbanizations)

Rehabilitation of children's facilities added to the urbanizations, namely in the Carregal Urbanization.

Objective 3.3. Adapt and preserve the religious heritage

Adapt spaces for various purposes – multifunctionality;

Form an association to support people with employment problems and in the school-business relationship;

Create a tourist-religious route, in conjunction with the facilities in the municipality of Vila do Conde.

Objective 3.4. Develop cultural activities
Create a network of cultural venues and promote the realization of cultural events;
Use the area outside the ARCA headquarters building for presentations, seminars, conferences, and exhibitions with free access.
Objective 3.5. Requalify river "Botica"
Planting of riparian gallery tree species on the banks of the stream;
Creation of a picnic park-like area with shadows of trees, articulated with the path along the stream;
Implementation of rest areas (complemented with viewpoints) along the path of the park.
Objective 3.6. Encourage multifamily housing
Promotion of low and medium cost multifamily housing;
Construction of multi-family housing in the surroundings of the Industrial Zone, benefiting from the accessibility provided by the A28 junction.
Objective 3.7. Enhance feature elements
Creation of artistic installations (permanent or temporary) in spaces of greater visibility/public use;
Use of abandoned building facades for urban art demonstration/exhibition.
Objective 3.8. Rehabilitate buildings over 50 years old
Objective 3.9. Alleviate the inconvenience caused by Francisco Sá Carneiro Airport
Seek to obtain measures, in conjunction with Francisco Sá Carneiro Airport, that is capable of compensating the population for noise pollution from air traffic;
Planting of trees and vegetation, with the capacity to reduce noise pollution, throughout the parish.
Objective 3.10. Develop a network of facilities dedicated to the elderly population
Construction of various facilities, including a home, a day-care centre, a pharmacy, and/or a health centre.
Objective 3.11. Control the flow of large cargo transport vehicles
Planting of green elements that reduce pollution from the flow of vehicles;
Ensure specific and safe routes for the traffic of vehicles with large loads.
Objective 3.12. Requalify the facilities and their surroundings
Provide facilities for public use with ramps that guarantee access to people with reduced mobility;
Construction of sidewalks and implementation of urban furniture to support activities carried out in the various facilities (school and local authority).
Objective 3.13. Provide services and infrastructure to support youth dynamics
Use of available cultural facility (ARCA headquarters) and vacant buildings for contemporary music parties (pop, electronics, indie, etc.);
Creation of free Wi-Fi zones in public spaces;
Creation of public study space to support school activities.
Objective 3.14. Increase and upgrade sports facilities
Construction of a gym or rehabilitation/physiotherapy centre with swimming pool;
Provide the Sports Park with greater readability, with parking spaces, urban furniture, lighting, and sidewalks;
Rehabilitate the restaurant space (cafe) in the sports park.
Objective 3.15. Promote local commerce

Construction of an organic market for the sale of products produced in the region, in particular, “fresh products”;
Use of the most popular roads to implement commercial spaces.
Objective 3.16. Increase the offer of private services
Use of the Industrial Zone as a multifunctional, technological and accessible hub, building office-sharing spaces - Coworking;
Installation of Bakery/Pastry;
Modernize the environment of existing cafes, with new paintings and natural light, adapting them to the younger community offering free Wi-Fi;
Capture employment or training centers;
Build a school of short courses, knowledge certification, and internships.
Objective 3.17. Develop the connection between the parish and the Industrial Zone of Aveleda
Use of green elements, as a link to the Industrial Zone;
Design of pedestrian paths, namely sidewalks, that connect the different areas.
Objective 4 - Infrastructure e mobility
Objective 4.1. Stimulate joint strategies and implement networks between the municipalities of Maia, Matosinhos, Póvoa de Varzim and Vila do Conde
Integrate the parish in a broader context than the municipality itself, linking it to the other municipalities that surround it;
Establish incentives for entrepreneurs who establish themselves in the parish (together with Vila do Conde City Council).
Objective 4.2. Improve conditions on the A28 - EN 13 route, through Rua de Aveleda and Rua da Igreja
Improve the conditions of the path, taking into account the street profile, construction of sidewalks, trees, and urban furniture;
Use of the most affluent roads for the implementation of proximity services and commerce;
Change the cobblestone pavement of the most crowded roads to bituminous.
Objective 4.3. Mitigate pollution from road traffic
Plant trees in the Industrial Zone and its surroundings with specific vegetation, thus reducing pollution from road traffic.
Objective 4.4. Improve road profile
Reorganize road directions and routes, respecting: the available street profile, the implementation of a network of sidewalks and cycle paths;
Creation of a network of bicycle routes, incorporating leisure routes (public spaces) and green routes.
Objective 4.5. Enhance the identity of Aveleda
Change the name of the metro station to “Aveleda (Vilar do Pinheiro)”.
Objective 4.6. Improve road infrastructure
Implement improvements in the operationality of the road network through the improvement of the hierarchical road structure;
Change the pavement of access roads to residential areas and the civic centre, in cobblestone, to concrete blocks.

Objective 4.7. Create a network of public leisure spaces
Connecting the public space through green elements (trees, flower boxes, shrubs) along the road;
Placement of urban furniture, for example, rubbish bins, flower boxes, and lighting;
Installation of leisure and rest facilities in public spaces, for example, sports machines, benches, and viewpoints;
Develop the Parque das Aveleiras (see objective 2.1.) as a way to integrate the various public spaces through pedestrian paths and cycle paths.
Objective 4.8. Rehabilitate and increase the number of bus stops
Rebuild bus stops, following an innovative, prominent design;
Increase the number of bus stops, mainly in residential and industrial areas;
Provide the stops with up-to-date information on public transport times, routes, and interfaces.
Objective 4.9. Encourage the use of the Metro by the resident population
Change of fare through the use of the single-pass – andante – on buses, which can be used through the card (physical) or the application (digital);
Use of this station as an interface between metro and bus, providing all information, visibly, regarding schedules, routes, and stops;
Implementation of an area for bikes rental – bike-sharing – in partnership with Metro do Porto;
Assignment of a sustainable, electric means of transport to transport the elderly to and from the station.

4 Conclusions

Aveleda is a territory of widespread urbanization of high complexity, where very different realities coexist and planning is not at all easy. The proximity to the nucleus of the Porto Metropolitan Area and the existence of a set of facilities and infrastructures of great dimension and impact (for example Francisco Sá Carneiro Airport, Port of Leixões, Shopping Centres, etc.) offers particularly unique in terms of circulation binomial -employment/housing. However, and despite the different problems detected, the parish of Aveleda also has a considerable potential that should be explored to increase the level of well-being of the population.
Therefore, with the purpose of the population's quality of life, an integrated and inclusive proposal was designed carrying 30 strategic objectives and 70 concrete measures, capable of promoting the improvement of the parish. The following aspects should be highlighted from the proposal:

- The importance attributed to the valorisation of the historical heritage of Aveleda, as an element of tourist attraction and promotion of the feeling of "belonging" to the place, of identity and pride of the population in the parish;
- The creation of a public park "Parque das Aveleiras", assuming itself as the necessary centrality to restore the parish's attractiveness. A meeting and diversity space, qualified to provide quality of life and well-being to its users, and, at the same time, attract a new resident population;

- Support for the construction of multi-family housing, of low and medium-cost, especially in the surroundings of the Industrial Area of Aveleda, providing housing for many families seeking this type of offer due to economic difficulties;
- The development of a network of facilities dedicated to the elderly (homes, day centers, pharmacies, etc.) to respond to the needs associated with increased longevity and an aging population;
- The redevelopment of the local road structure, increasing the profile of the roads, designing sidewalks, and organizing traffic directions, making the parish safer, pedestrian-friendly, and attractive.

It is important to emphasize that in the implementation of the proposed measures, the need for a significant monetary investment, public and private, could not be ignored, which would have to be properly considered, both in terms of the availability of financial resources and in terms of priorities for the development of the parish.

Finally, it is also important to highlight the crucial role that the population of Aveleda could and should play in developing the strategy and creating a favourable environment for its implementation.

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Tactical interventions to promote micromobility in suburban areas: a comparative analysis of existing methods

Freddy Nogueira, Filipe Moura, Ana Sá

Affiliation: Civil Engineering Research and Innovation for Sustainability (CERIS), Centre for Innovation in Territory, Urbanism and Architecture (CiTUA), Instituto Superior Técnico (IST), and the University of Lisbon.

e-mail: freddynogueira@tecnico.ulisboa.pt

The rapid urbanization that occurred in large metropolises worldwide has caused some impacts on the morphology of the cities. In some zones, the lack of coordination during the implementation of houses and services created car-only dependent places, which did not follow the human-scale planning, especially in suburban areas. In addition, disruption moments can accelerate the necessity to intervene in public space to guarantee acceptable use and appropriation. In another perspective, it has caused a lack of social cohesion and some empty spaces in the suburbs. Tactical interventions such as Urban Acupuncture, Tactical Urbanism, Guerrilla Urbanism, DIY Urbanism or Pop-Up Urbanism appear as alternatives in terms of supporting actions to activate more equitable and dynamic spaces, with an adequate appropriation of public spaces by the citizens, giving new uses to roads, and other public spaces. Furthermore, those actions can fill the empty zones with new activities, modes of transportation, and urban life. Despite the already existing discussions around the topic, there is still a need to identify their main divergences correctly. This paper aims to study the base of the concepts of tactical interventions, perceive their differences, and how each of them can be used alone or in combination towards the integration on the formal planning process to achieve suburban areas that focus not only on the automobile but also in support of human-scale-based modes of transportation.

Keywords: Tactical interventions; Urban planning; Micromobility; Equitable Public Spaces

1 Introduction

Cities are concentrating an increasing number of inhabitants, with the subsequent need to provide more efficient systems, break some paradigms, and improve the residents' quality of life. Transportation infrastructure play an essential role in this context, and it is occurring in the last decades a shift from the priority on the planning to the automobile to a more equitable appropriation of public space by divergent modes of transportation (Fulton, 1996; Hou, 2010). In this situation, ideas of regaining public space and designing it for people have increased, as Gehl (2013) referred to the need to plan the city *"in a scale of the eyes*." It favours human socialization, mixing divergent uses, supporting pedestrianization and other soft modes, replacing conservative thoughts, and guaranteeing benefits in the transportation field and healthy-related aspects such as air quality, economics, environment, and social.

Aligned to that, United Nations (2011) has defined the seventeen sustainable development goals. Goal number 11 is the agreement to make cities more inclusive, safer, resilient, and sustainable, with participatory planning playing a vital role in implementing those measures. Also, urban transportation is one of the critical elements to support the achievement of that goal due to its complexity and capacity to drive changes in the behaviour of citizens and land-use patterns (Handy, 2005; Cervero and Landis, 1995).

Banister and Linchfield (1995) argue that transportation systems can impact cities and regions' spatial and economic development, with the attractiveness of a particular location significantly depending on accessibility. Historically, central areas with high levels of accessibility have suffered from real-estate speculation, which has caused the search for cheaper, although far from the centre, properties that instigated motorized vehicle dependency, shaping suburban areas worldwide to the private motorized vehicle supremacy.

Sparks (2019) argues that the neo-liberalization of public space has caused inequalities even further due to the lack of capacity to align government and market objectives with a disconnection between theory and practice of neoliberalism. In this context, small-scale and low-cost interventions such as tactical interventions in urbanism appear as authentic expressions of urban vitality due to its capacity to diminish inequalities and make the urban environment more friendly, with the application of recycled materials, paint, and other low-cost materials (Finn, 2014; Lydon and Garcia, 2015; Elrahman, 2016). Lydon and Garcia (2015) infer that the objective of those interventions is not to overcome the traditional planning process but support new ones as an experimental phase of the plan or as a phase 0 of the intervention that can be used by the decision-makers afterward. Jacobs (1961) and Silva (2016) define the city as an open laboratory and a place where those low-cost interventions can be applied without significant concerns, meaning that interventions can shift towards sustainable urban development and achieve the urban agendas.

Scholars tend not to differentiate them when using the terms, causing some mistakes and misuses regarding the classification, how they are applied, the main objective, or even the presence of participation of citizens in partnership with the public authorities. Moreover, it is motivating to deep knowledge about the interventions towards a better appropriation of public space. We used Google Scholar and B-On to look for the most recurring terms and definitions of tactical interventions' papers and publications since 2017. After analysing 41 papers, we got: Urban Acupuncture, Tactical Urbanism, Guerrilla Urbanism, Pop-Up Urbanism, and DIY Urbanism. Finally, the present paper is structured to create and develop a thinking track to distinguish, based on the historical formation of the metropolises worldwide, with emphasis on the suburban areas and its adaptation during disruption moments, the forms of reaction in terms of appropriation of public space that culminated in the tactical interventions.

The concept of tactical interventions in urbanism is considered new, but many actions are not. According to Lydon and Garcia (2015), some actions related to new uses to existing public spaces were implemented back in the early 20th century, when the New York Times reported a plan to regulate traffic to protect pedestrians, especially children. Due to the success of the early projects,

the New York City municipality has implemented a plan to establish play streets (Figure 1) during the summer of 1914 to play sports and games and participate in cultural activities.

Figure 1. Play Streets in New York City. Source: We Love LB (2020).

The following decades represented an increase in automobile solutions worldwide due to the expansion of the industry, meaning that the actions were targeted to car dependency and not to the scale of people. Only in the 1970s and 1980s was there a comeback of the public space appreciation directed to people and soft modes inspired by New Urbanism (Fulton, 1996). Lyndon and Garcia (2015) present examples from that epoch in different contexts. The first one is the *woonerf* (Figure 2), installed when a group of residents in Delft – Netherlands, were worried about the increasing number of accidents, congestion, and pollution as car use increased. According to Schlabbach (1997) and Kjemtrup and Herrstedt (1992), they have made themselves measures of traffic calming and support to shared spaces. The public administration recognized this citizen-led and bottom-up initiative, and since 1976, citizens who live in the Netherlands can make some alterations to make people willing to walk, cycle, and play.

Figure 2. Examples of the Dutch *woonerf* in the Netherlands. Source: Meia um Arquitetos (2015) and Kuntzman (2019).

Another exciting project was establishing the *Ciclovía* project (Figure 3) in Bogotá, Colombia in 1974, which young activists first implemented and got the attention of other stakeholders, such as citizens and local government. The project successfully works and has inspired many other projects worldwide (Murcia et al., 2014) due to the capacity to engage and empower citizens during planning, design, and application of measures.

Figure 3. Project *Ciclovía* in Bogotá during the 1970s. Source: Instituto Distrtital de Recreación Y Deporte (2020).

According to Antrop (2004), after the conflicts in the Second World War and aligned with the crescent automobile industry, the form of the cities was changed, with the construction of many infrastructures to support motorization causing urban sprawl and disconnection between suburban and central areas. It was also aligned to modernism and rational planning concepts based on mass production (Natrasony and Alexander, 2005), triggering more expenses to the public authorities.

However, with the enhancement of the participatory planning starting in the 1960s (Smith, 1973) and the subsequent shift from a rational to a more participatory approach of interventions in the public space, there was a tendency to adapt existing streets to promote equity between transportation modes.

Figure 4 represents the application of those techniques in divergent contexts worldwide (Asia, North and South America, and Europe) and following the strategies proposed. It is interesting to note that despite the location, weather, and economics, there is, for most of the situations, a solution to guarantee a proper application of the interventions, meaning that they are flexible solutions.

One of the most precious aspects of those interventions is public involvement. There is a shift from the traditional approach towards a more participative and collective planning process. According to Lydon and Garcia (2015), citizens play an important role due to their capacity of participation in tactical interventions, creation, and activation of the neighbourhood in the short-term action, which can impact a broader temporal space. People and their relations in the space are never static, and those interventions do not propose one-size-fits-all solutions but flexible ones. As Silva (2016) and Németh and Langhorst (2014) referred to, the emerging of tactical interventions in urbanism occurred because of the movement's initiatives to shift from a rational planning process to a participatory approach, and they are decent examples of bottom-up processes.

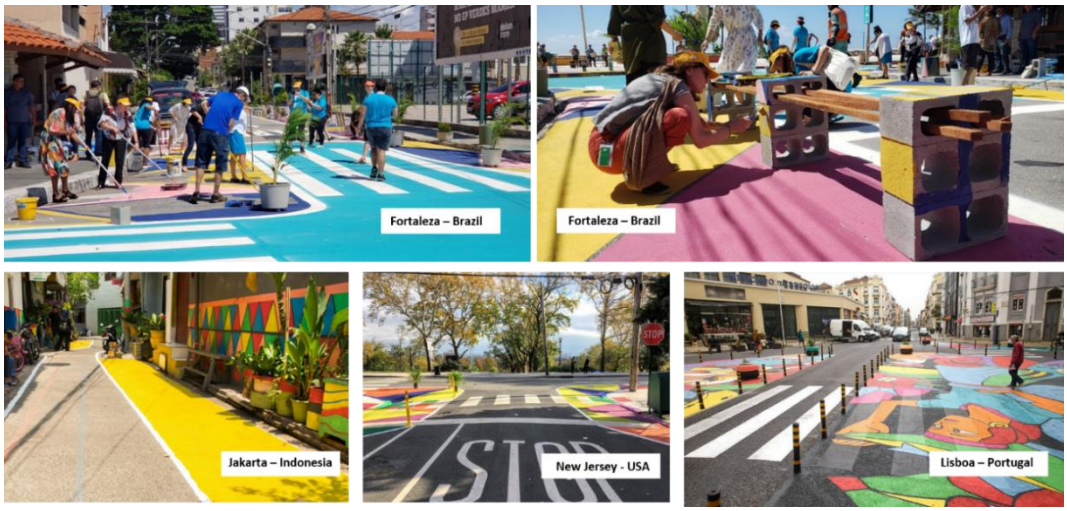

Figure 4. Examples of Tactical Interventions in different contexts worldwide. Source: ITDP (2019), Blog beopenfuture (2018), The city at eye level (2018), and Fly news (2021).

Tactical interventions and their relations have changed because planning institutions are now more open to bottom-up initiatives and more integrated into the process (Lydon and Garcia, 2015). Sparks (2019) argues that although the more significant number of interventions related to tactical are citizen-oriented, municipal departments, governments, developers, and non-profit organizations can initialize test ideas and new forms of action.

On the other hand, the process can also combine top-down and bottom-up analysis, which also requires a reconsideration of the current trends of planning authorities. Tactical interventions in urbanism apply in an innovative form the concept of temporary use, in which there is a concern of more dynamic, flexible, and adaptative urbanism, where cities can prepare for new needs, demands, and preferences of their users (Németh and Langhorst, 2014). Moreover, public participation in inquiries and consultations and on the implementation phase leads to better efficiency of the plan or program, with improved adhesion, due to the capacity to effectively solve the needs and necessities of the stakeholders involved (Ferrão, 2014). Therefore, tactical interventions can also benefit from the advantages of this broader involvement, which also applies to public space appropriation.

2 Search Strategy

We found a gap in the international literature regarding the definition of principal concepts that involve tactical interventions and how to organize them to make things delineated. Although there are divergences on the terms, scholars chose one definition and referred to every tactical intervention as their chosen definition, causing misunderstandings and deficiencies on the correct application. Furthermore, to support the present work, we made clarifications that will contribute to this field of research due to the lack of separation and even overlap between them.

Hence, the criterion for choice (Figure 5) is based on the research of B-on and Google Scholar, in which the author's election was for the search mechanisms, including the keywords tactical

interventions, low-cost interventions, and urban interventions, for the publications after 2017. That resulted in 41 publications and recurring tactical interventions: Urban Acupuncture, Guerrilla Urbanism, DIY Urbanism, Tactical Urbanism, and Pop-Up Urbanism.

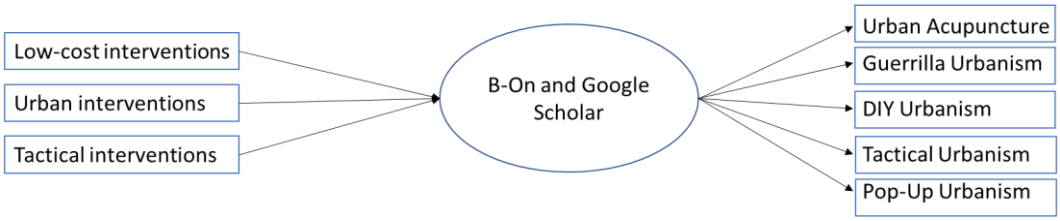

Figure 5. Schematization of search strategy used.

The terms were organized in topics to guarantee an adequate exposition. There was a separation in the designation, brief explanation, and the author that refers to the concept. Then, it is considered the year that the topic emerged and where it has been published or applied. Furthermore, it is thought-provoking to know the approach used among citizens and the public authorities: top-down or bottom-up. Then, it is relevant to look if there is a citation of the application of low-cost and temporary spaces and the relation between tactical interventions and the promotion of micromobility. Finally, there were analysed the integration of the planning system, whether formally integrated or not, and how it occurs.

3 Definitions of tactical interventions

First, it is inferred by Lerner (2006) and by Ferrão (2014) that the planning process can be adjusted to adversities, and not all the variables are strictly under control. Hence, tactical interventions in urbanism have emerged from the lack of resources and the lack of action after applying a new plan, resulting in better utilization of materials. Mould (2014) states the term tactical as the concept of urban strategy, in a way that they become part of a plan due to the interventions in the city in a tactical manner due to the capability to take place momentarily of misused urban spaces. Regarding the levels of administration in urban planning (Strategic, Tactical, and Operational), Mould (2014) defines tactical interventions in a hybrid zone between tactical and operational levels due to the duration and rapid application of methods.

Deslandes (2013) defines it as a type of local-driven renovation, where citizens are invited to exercise their creativity to restore urban places. Bermann and Marinaro (2014) define it as the everyday actions in illegal limbos. Campo (2014) refers to giving attention to the abandoned spaces and giving them the required use. Another definition is given by Silva (2016), which describes small-scale interventions with a broader achievement. Other definitions are found on Marshall, Duvall, and Main (2016), which creates usable spaces and land in cities.

Further connected to cities, it relates short-term and low-cost actions or policies. Silva (2016) infers that tactical interventions in urbanism have emerged from the perception that the city is constantly changing, with the citizens as the base for modifying the public space. Sparks (2019) defines tactical interventions as actions taken by groups, sometimes anonymously, to temporarily alter the built environment, often commenting on how urban space is allocated. These interventions are primarily

low-cost and temporary, with a quick application drawing attention to the perceived failures. Graziano (2020) defines tactical interventions as a set of micro-actions at the neighbourhood level to defund bike paths and pedestrian routes.

Sparks (2019), Herman and Rodgers (2020), and Graziano (2020) cite that those small-scale and temporary interventions can occur spontaneously, organically, or accidentally. In terms of names, the strategy and its more spread techniques have many approaches and divergent names, which can be Tactical urbanism (Lydon and Garcia, 2015), Urban acupuncture (Lerner, 2006), Guerrilla urbanism (Hou, 2010), DIY (Do-it-yourself) urbanism (Iverson, 2013; Finn, 2014) or Pop-up urbanism (Elrahman, 2016; Graziano, 2020). Their essence is similarly based on punctual interventions with broader impacts on transportation, public health, housing, urban life, and environmental emissions. However, there is a necessity to clarify and understand their fundamental differences to avoid misuse or wrong interpretations.

4 Discussion and further knowledge of differences

First, there was the emergent topic of Urban acupuncture, which was defined by Brazilian author Lerner (2006) as strategic and punctual interventions that can create a new synergy to an area, supporting other changes that will cure, improve, and create positive reactions in the city, as a chain, due to the time-consuming of the traditional planning process. Those interventions are not concerned about the scale. It is cited by Lerner (2006) some examples as the Park Güel in Barcelona or the implementation of *Ópera de Arame* in Curitiba, which are tactical interventions inserted on urban acupuncture, but they are not small-scale. Moreover, some acupuncture interventions are represented by physical aspects and by a change in habits or behaviour, such as street closures to cars on some days of the week. Urban acupuncture can occupy spaces inner the city without significant concerns regarding unfilled spaces, which can also be inserted in empty spaces. Therefore, most of the urban acupuncture interventions are not temporary, and regarding the integration in formal planning, the integration is due to the facility to operate and plan the changes that do not depend strictly on the physical aspects.

The term Guerrilla Urbanism was defined by Hou (2010), with applications in the USA and England, and is represented by the ways that citizens and communities act to appropriate, adapt or create public spaces, very often in a boundary between legal and illegal actions, using measures that are short-term, unsanctioned, and unscripted. Hence, there is a colossal representation of citizens and how they can change and transform the city. However, regarding the approach defined, it is bottom-up due to the direct participation of citizens. Furthermore, it mentions the application of low-cost instruments, with primarily the temporary use. Hence, in terms of integration on the planning system, its actions are not integrated yet.

The term DIY urbanism was expressed simultaneously by Iverson (2013) in Australia and Finn (2014) in the United States of America to characterize solutions that focus on the single users or small voluntary groups, from the design phase to the payment. The objective is to implement the measures without the involvement of municipalities or corporations, which means that this is a bottom-up and

low-cost approach. Those interventions can be applied in the empty areas of the city, but at the same time, they can be applied to central and crowded areas, many times as a joke or trick with the inhabitants. Hence, those measures referred to as DIY urbanism are small-scale, and there is no straight line to define the timeline of the interventions. Moreover, actions can be temporary or permanent, and there is no mention in terms of integration on the planning system.

Tactical urbanism was defined and explored by Lydon and Garcia (2015) in the United States of America with a meaning of relation to small-scale actions serving a larger purpose, in a never-static territory, one-size-fits-all solutions are not the most appropriate. In opposition to a DIY urbanism approach, Lydon and Garcia (2015) define that not all DIY urbanism is tactical because there is a need to be quick, and it must have impacts in the long term, which is not crucial for DIY urbanism. The approach is based on the bottom-up perspective, with citizens playing a vital role in the context, using low-cost interventions. The horizon of the interventions is supported by both temporary and permanent actions, with the actions not integrated into the formal planning process. Furthermore, it has massive support to a bottom-up approach, using paint, wood, and recycled materials, in the process of creative work in a short-term action to a long-term change.

Regarding Pop-up urbanism, it has been defined as a tool for the governments to engage citizens in partnership projects, with the capability of a long-term change initiated by small interventions, which makes it similar to tactical urbanism in some aspects. However, the definition englobes a substantial number of actions. (Elrahman, 2016; Graziano, 2020). Moreover, it is blurred the origin and the place where it has been applied first.

Pop-up urbanism is based primarily on the top-down approach, with no direct mention of low-cost actions. Also, it can be both temporary or permanent, and most of its actions are already included in the formal planning process. Table 1 illustrates the principles and relations among the terms defined in this work and presents the differences and similarities.

Table 1. Main Concepts and critical differences. Source: Author (2021).

	Urban Acupuncture	Guerrilla Urbanism	DIY Urbanism	Tactical Urbanism	Pop-Up Urbanism
Author	Lerner (2006)	Hou (2010)	Iverson (2013) and Finn (2014)	Lydon and Garcia (2015)	Unknown
Place	Brazil	U.S.A. and England	Australia and U.S.A.	U.S.A.	Unknown
Designation	**Punctual** interventions to create new synergies.	**Creation and adaptation** of public spaces by citizens.	Interventions **created by citizens** from the design until the costs.	**Short-term action** in **a long-term change.**	Tool for **engagement of citizens** in partnership with governments.
Can it be used to direct support micromobility?	Yes	Yes	Not mentioned	Yes	Not mentioned
Approach	Top-Down	Bottom-up	Bottom-up	Bottom-up	Top-Down
Does it mention low costs?	No	Yes	Yes	Yes	No
Temporary or Permanent	Not mentioned	Temporary	Both	Both	Both
Integrated on the planning system?	Yes	No	Not mentioned	No	Yes

As shown above, in Table 1, at least five scholars have worked with tactical interventions on the public space, focusing on a broader change. The topic has also been worked in North America and in Europe, Oceania, and South America, a sign of capability to replicate diverse economic and sociodemographic contexts. In terms of support to micromobility, most techniques can be directly applied to support it, with only DIY and Pop-up urbanism not mentioning it. Their approach is divergent, with some supported by top-down (Urban acupuncture and Pop-up urbanism) and others by bottom-up (Guerrilla Urbanism, DIY Urbanism, and Tactical Urbanism). Regarding the duration of those interventions, only Guerrilla Urbanism focuses on temporary, while both temporary and permanent perspectives characterize DIY Urbanism, Pop-up Urbanism, and Tactical Urbanism. In terms of integration in the planning system, Urban acupuncture and Pop-up urbanism can be inserted into the formal planning process, showing a strict relation between a top-down approach and the facility to insert those measures on the process, while Guerrilla Urbanism, DIY Urbanism, and Tactical Urbanism are not legally integrated on the formal process yet, meaning that the ones based on the top-down approach are likely to be inserted easily on the planning process.

5 Conclusions

Cities are increasingly concentrating many inhabitants, with the surcharge on the systems inner the urban context and impacting the transportation infrastructures. Furthermore, after Second World War, urban production was focused on mass production, prioritizing the automobile, without significant concerns about urban density, human scale, other modes of transportation than the car, or even infrastructures related to the urban sustainable modes of transportation. In this context, public authorities have faced adapting urban environments to obtain a more equitable space, with dedicated adequate space for divergent modes. Hence, tactical interventions appeared as one feasible solution in rearranging public space due to its capacity to promote changes without high associated costs and broad impacts on the public space.

Moreover, there was a gap in the literature regarding a clear definition of the main topics related to the theme. The decision was to focus on Urban Acupuncture, Guerrilla Urbanism, DIY Urbanism, Tactical Urbanism, and Pop-up urbanism. It was found that at least five scholars have worked with the topics with divergent geographic backgrounds and descriptions, meaning that those interventions can be applied to different contexts. The approaches and definitions analysed focus on appropriating public space, with punctual interventions that emphasize space's equitable use. Then, it was also found that their basic definition differs, although their essence is similar. It was noted its divergence in terms of approach, focusing on top-down (Urban Acupuncture and Pop-up Urbanism) still being more accepted by the public authorities to be inserted on the formal planning process, indicating that the tactical interventions based on the bottom-up (Tactical Urbanism, Guerrilla Urbanism and DIY Urbanism) still need to contest the formal planning processes. Hence, most of them are hybrid in temporary or permanent, and the majority explicitly mentions low-cost actions and can directly support micromobility. Finally, this study could not encompass every definition and strategy of tactical interventions in urbanism, but it has focused on the most common according to the search strategy proposed.

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Human Scale Cities and Children's Wellbeing: Parents' attitudes on Children's Independent Mobility

Garyfallia Katsavounidou,[1] Elpiniki Voutsa[2]

[1] Assistant Professor, School of Spatial Planning and Development, Aristotle University of Thessaloniki, Greece

e-mail: gkatsavou@plandevel.auth.gr

[2] Economist, Municipality of Kordelio-Evosmos, Master in Spatial Planning for Sustainable & Resilient Development

Independent and active mobility is a major component of children's quality of life and wellbeing. Being able to get around on one's own contributes to a child's physical and mental health, cultivates his/her social skills, and primes the young person for active and sustainable mobility choices when he/she becomes an adult. Both environmental factors, such as urban structure and morphology, and personal and social parameters, such as age, gender, family structure, socioeconomic status, and cultural attitudes, influence the degree of children's independent mobility. This paper focuses on the physical characteristics of open spaces as a determining factor for children's mobility. It is based on the hypothesis that the design of streets and pedestrian routes is of decisive importance for parents' attitudes towards perceived safety, thus greatly affecting their children's degree of independent mobility.

This hypothesis was tested via a field research in Kordelio-Evosmos (population 101,753), a municipality in western Thessaloniki, which has one of the highest percentages of children population among Greek cities. A survey (N=97) was conducted through a structured questionnaire addressed to parents of elementary school students, regarding their children's mobility. We found out that, despite short distances between home and school, a mere 15% of children commute to school on their own. The majority is accompanied by an adult, either on foot or in a car. Absence of efficient pedestrian infrastructure, poor quality of street design and drivers' illegal behaviour, such as violations of speed limits and pedestrians' right of way, emerge as the three most important factors affecting parents' attitudes on their children's mobility.

Keywords: children's independent mobility; urban design; children's wellbeing; elementary school children; Thessaloniki, Greece

1 Introduction

1.1 Children in the city: A much-neglected group of users

According to the United Nations, world population has doubled in the last 50 years, and since 2014, more than half of the world population live in urban areas. It is predicted that this percentage will grow, as urbanization rates continue to soar, and will be about 60% by 2030. One out of three people will be living in cities of a population of at least half a million (United Nations, 2016). This proportion is expected to rise to 7 out of 10 people by 2050 (Malone and Rudner, 2017). In the intensely urbanized world we live in, more and more children will be living in cities, in environments that are quite unsuitable for a child to grow up in. As a response to the adversities children have been facing throughout modern urbanization, starting from the era of the first industrial cities, the twentieth century

saw a growing interest in safeguarding children's rights, which led to the UN Convention on the Rights of the Child (UNCRC) in 1989, ratified by all UN members except the United States.

Research on the impact of urban environments on the lives of children has been the subject of different disciplines, ranging from health studies (Davis and Jones 1996) to legal studies, pedagogy, psychology, and sociology, and from urban geography (Christensen and O'Brien 2003) to urban planning and urban design (Danenberg et al, 2019). Interdisciplinary studies around the world converge to the conclusion that urban space is instrumental for environmental learning process and development of necessary social skills; the quality of open public space in a city greatly influences interpersonal relationships in childhood but also later on, in adult life (Lennard and Lennard, 1992). However, despite the importance of the built environment and of public spaces, in particular, for children's lives, urban design focuses on the needs of adults and children are marginalised as users (Katsavounidou, 2019). Although the child-city relationship is cross-disciplinarily regarded as important, children continue to be ignored by architects, planners, civic authorities, and urban designers (Lennard and Lennard, 1992).

The quest for the development of a new paradigm of city design, in which children's needs and capabilities would be taken into account, began in the 1970's, with UNESCO's program "Growing Up in Cities" (Lynch, 1977; Chawla, 2000). Since 1996, UNICEF promotes the Child Friendly Cities Initiative (CFCI), supporting urban development that will ensure children's access to basic services, clean air, and water, as well as affordances of safe open spaces to play, learn and grow (UNICEF, 2018). According to the CFCI, the attributes of a Child Friendly City include:

Participation of children and youth in decision making processes regarding issues that influence their lives

Unhindered possibilities for children to participate in the cultural and social life and in the life of the community

Living in a safe, healthy and clean environment, with access to green spaces and to spaces for play, leisure, socialization and gathering

Equal opportunities to life advancement independently of nationality, religion, gender, or ability, for all children

1.2 Scope of research: Connecting children's mobility and wellbeing with urban design

The paper connects the concept of children's mobility to that of their overall wellbeing and argues that urban design influences both to a large extent. The holistic term "wellbeing" refers to a multi-dimensional construction that incorporates cognitive, psychological, physical, and social dimensions (Waygood et al, 2017) and is interconnected with everyday quality of life. However, when we refer to children, the term is defined both by indicators of "material wellbeing," such as living under the poverty line, lack of education, lack of employment of parent-adult etc., and by "subjective indicators," such as social connections, perceived quality of life, life satisfaction etc. (Chase and Statham, 2010), which are based on personal evaluation. Wellbeing is also connected to the learning opportunities of the child and the financial situation of the child's family (Waygood et al., 2017), as well the rights of the child (Chase and Statham, 2010). Thus, children's wellbeing is a crucial indicator of both the overall wellbeing in the city and urban sustainability *per se*.

Wellbeing and mobility are closely connected. Mobility is a basic freedom that all children should have. It is a right recognized in the UNCRC (United Nations, 1989), which states that children have the right to rest and to leisure and to engage in play and in recreational activities (Article 31). The UNCRC also recognizes children's right to a living environment that meets their physical, social, and mental needs (Article 27). Children living in environments that allow them to get around in active and independent ways benefit psychologically and socially and have a greater level of wellbeing (Leung and Loo, 2017). Since the degree of children's independent mobility is influenced to a large extent by the physical characteristics and affordances of urban space, the role of urban design, and particularly the design of streets and pedestrian routes, plays a most crucial role in shaping child-friendly environments.

Around the world, the issue of children's independent mobility is addressed in studies in various disciplinary fields, from children's geographies to transport planning. The multi-faceted importance of mobility for children's quality of life as well as for the overall sustainability of cities explains the growing volume of research on the subject (Hillman et al, 1990; Gaster, 1992; Pooley et al, 2010; Waygood et al, 2017). Research on children's mobility includes policy papers (Shaw et al, 2015) and, quite importantly, comparative studies that document how children's mobility has changed through time (Prezza et al, 2001; Schoeppe et al, 2016; Babb et al, 2017). In Greece, however, research on this field is virtually non-existent. There is a lack of diachronic statistical data and of quantitative studies regarding children's mobility. No data exists even on basic trips, such as the daily commute to school, except for a very recently published study (Kotoula, 2021). While there is virtually no data on how children get around and therefore no understanding of the reasons of their mobility attitudes, in public opinion, the issue of children as users of city streets is presented as a problem of road safety. There is a tendency to present traffic danger as a *problem of the children*, but international research shows that children should not be burdened with the responsibility of road safety, since it is the adult society that is creating it (Waygood et al, 2017). In Greece, children's mobility is, sadly, connected to the perceived need to "educate children" on traffic rules instead of questioning the urban environment and social behaviour that create traffic danger (Katsavounidou, 2021).

In response to these shortcomings at national level on this subject, both in academic research and in public opinion and state policy, the aim of this study is to gather data on children's mobility in a given area (Kordelio-Evosmos), by investigating parents' attitudes on the mobility patterns of their children (aged 6 to 12 years old), and to correlate these answers with the characteristics of the built environment, while answering these main research questions:

How do children travel to and from school on an everyday basis?

What are the determining factors for parents' choices regarding the daily commute to and from school?

How does the built environment and its material characteristics influence parents' choices, and thus children's mobility patterns?

2 Children's Independent Mobility (CIM): Why is it important?

2.1 Definition and historical development in CIM

The term "children's independent mobility" (CIM) refers to children's freedom to get about and play in their neighbourhood unaccompanied by adults (Shaw et al, 2015). Since walking and biking are the only two ways for children to travel autonomously, CIM focuses on these two means of transport, which have been for many decades on the margins of transport policies. According to studies from various countries, initiated as early as in 1990 by Hillman et at, levels of independent mobility of children have been in continuous decline during the last decades (Malone and Rudner, 2017), despite of its significance, from a range of perspectives such as children's physical and mental health, their social learning as well as overall urban sustainability.

Significantly, in urban areas, a great part of everyday "necessary" trips, meaning the trips that relate to activities that need to be done on a standard basis (Gehl, 1987), involves trips that are related to children, like school travel, participation in activities, medical visits etc. In addition to that, children' needs also influence trips related to optional activities, such as all kinds of leisure activities, and also to subsequent, social activities – meaning the activities that develop from the other kinds of activities and have a more impulsive in nature (Gehl, 1987).

In developed countries children's commute to school represents a significant percentage of total trips in urban areas, during all working days of the school year. Trips for educational reasons represented about 6% of all trips made during 2006 in Britain, while for children up to 17 years old, trips for educational reasons represent 27% of all their trips. These numbers show the wide range of social, economic, and environmental impact for individuals and families, and for the society as a whole (Pooley et al, 2010).

Historically, in relation to travel to and from school, due exactly to its everyday character, the loss of autonomy in children's mobility had led to a dramatic increase in the use of private car, for trips that should be easily done in active ways (on foot and/or by bike). According to the Safe Routes to School Initiative, in the United States, just a generation ago, half of the school children were walking to school, while nowadays only 1 out of 10 children do so. It is estimated that 10-20% of morning traffic is caused by parents dropping their kids to school by car (United States Department of Transportation, 2004). Ridgewell et al (2009) point out that the increase of car usage for school travels has roused worries in environmental groups, health authorities and schools themselves. In the United Kingdom, the percentage of children who travel to school on foot dropped by 20% in the period 1970-1991, while among children aged 4-11 years, 50% are driven to school, despite the short distance (1.6 kilometres) between home and school (Ridgewell et al, 2009).

Similar reduction in children's independent mobility and increase in car usage is manifested in studies in many other countries in Europe, such as Great Britain and Germany (Shaw et al, 2013), Italy (Prezza, 2001), while, in others, such as Finland (Kyttä 1997), studies show the different levels of CIM among children living in rural areas, towns and urban centres – with urban centres lacking in autonomy of movement. Analogous trends are observed in Vancouver, Canada, where almost 50% of students commute to school by car, while only 10 years ago, this was valid for 1out of 3 students. Similar trends are observed in Australia (Schoeppe et al, 2016) and in Hong-Kong, where while in

1991 67% of children travelled to school independently, in 2011 this percentage dropped to 30% (Leung and Loo, 2017),

2.2 The multi-faceted importance of CIM

Connecting the concept of child-friendly cities with sustainable development, Gilbert et al (2017) point out that there has not been sufficient discussion about the rising trend of using private cars for moving children around, for the daily commute to school as well as for their leisure. While many studies connect the rising use of the private automobile with many illnesses in children (diabetes, obesity, cardiological problems etc.), its impact on the creation of life-long habits that will accompany children when they become adults, has not been sufficiently examined (Gilbert et al, 2017). By being driven from a small age in the back seat of a car (in what is termed "back seat generation"), children acquire habits that are contrary to the current effort towards a turn to public transportation and to city-friendly ways of travel, to subvert car-oriented mobility policies that has been for decades the norm in most cities (Cook, 2019). Contrary to the existence of extensive sociological and environmental research on the connection of how urban environments and the form of cities influence sustainable mobility and vice versa, much less focus has been given on the role of children's mobility in this trend, as well as how it impacts CO2 emissions in a city (Gilbert et al, 2017).

Although there are fluctuations in the degree of independent mobility among various countries, studies show that there are common trends, which relate the decline of CIM with an increase of fear for children's safety, increase in the living standards of families, introduction of new technologies etc (Leung and Loo, 2017). Indeed, safety concerns, especially traffic danger, seem to be a crucial factor for parents to be reluctant to give "license" to children to travel independently (Ridgewell et al, 2009). Statistics confirm these parental fears. Traffic accidents are the leading cause of death for the age group 0-24 in the European Union. Counterintuitively, however, as more children are driven to school, more accidents tend to happen: the use of cars for the daily commute to school, apart from depriving the child of his/her freedom and autonomy, of his/her acquaintance with the neighbourhood environment and socialization, contributes in parallel to air pollution and, most importantly, raises the risk for accidents for children walking or biking, since the volume of traffic in children's routes to school is much bigger (United States Department of Transportation, 2004).

Acknowledging the epidemic dimensions and the multi-faceted negative impact in children's lives due to the acute decline in CIM, the Safe Routes to School (SRTS) initiative, which was implemented as a pilot in Michigan in 2003, has gained popularity among school communities. What started as a local initiative has developed into a federal-budget funded program (United States Department of Transportation, 2004). The SRTS program aims at strengthening children's ability to travel to school safely, on foot or by bike. The subsequent increase of physical activity has benefits for children's health, for decrease in traffic congestion and air pollution, as well as for the development of social dexterities and connections of children with their neighbourhoods. The present research is inspired by the SRTS program, regarding the structure of the survey and the focus on local conditions.

3 Field study in Kordelio-Evosmos: Background and Results

3.1 Geographical and urban characteristics of Kordelio-Evosmos

The field research took place in elementary schools located in the Municipality of Kordelio-Evosmos, which is one of the eight municipalities comprising the Greater Urban Area of Thessaloniki (Fig. 1). Kordelio-Evosmos is about five kilometres to the northwest of the centre of Thessaloniki and has a population of 101,753 inhabitants according to the 2011 Census (Municipality of Kordelio-Evosmos, 2016), covering an area of about 14 square kilometres. The municipality grew in terms of population between 2001 and 2011 at a rate of 31%, which was the second greatest growth rate among cities in the country. In comparison, the Municipality of Thessaloniki, comprising the central part of the urban area, saw a decline of population at a rate of 13.4%, with its population in 2011 being 325,182 inhabitants. In terms of age demographics, Kordelio-Evosmos is also the second "youngest" city in the country. According to the 2011 Census, the age group 0-14 years represents 19% of the total population (19,333 individuals), thus also lowering the median age of the inhabitants is 35.9 years, while the national median age is 41.9 years (Municipality of Kordelio-Evosmos, 2016). For reasons of comparison, in the case of the Municipality of Thessaloniki, the 0-14 age group represents a mere 10.36% of the population (Katsavounidou and Kourti, 2019). One could say that the dominant characteristic of the city of Kordelio-Evosmos is exactly its "youthful" character.

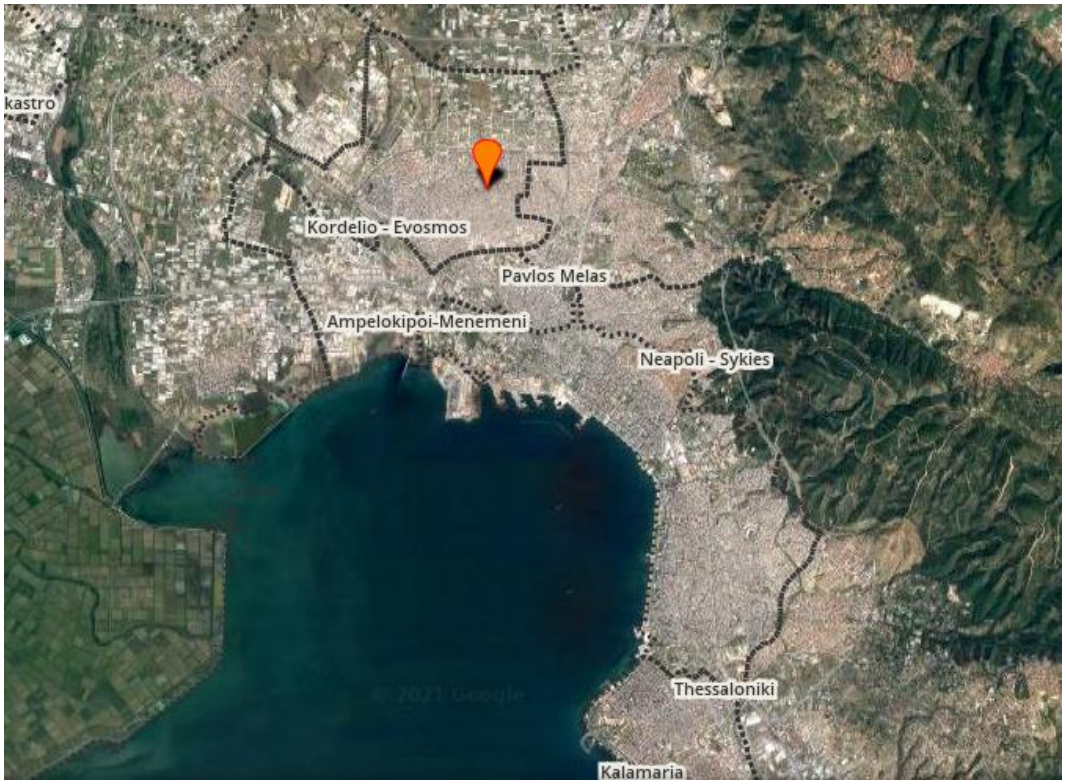

Figure 1. Aerial view of the greater urban area of Thessaloniki showing location of the Municipality of Kordelio-Evosmos. Source: www.oikoskopio.gr, authors.

Geographically, the municipality is located in proximity to the industrial zone of Thessaloniki and it is surrounded by major traffic axes, of metropolitan importance, as well as the railroad tracks, leading

to the main train station of Thessaloniki. The affordability of new multi-storey apartment buildings [*polykatoikia*] in recently developed areas in the municipality, as well as the easy access both to the centre and to the periphery of Thessaloniki, have been an attraction for settlement in the area, especially for young families, thus explaining the population growth.

The total number of elementary school children is 7,626 (for the year 2019-2020), attending one of the 35 elementary schools operating within the Municipality. As many schools share the same buildings, there is a total of 23 school complexes distributed spatially in the area.

3.2 Results

The aim of the study was to determine the factors influencing parents' choices on how their children commute to school and relate them to their (the parents') evaluation of the urban environment. The field research was conducted via a questionnaire for parents (N=97) of elementary school students, based on the SRTS survey methodology (United States Department of Transportation, 2004). The questionnaire had two groups of questions: the first group included questions about how children travel to and from school and the factors parents consider for the choice of mode of travel. The second part of the survey included questions regarding how parents evaluate the urban environment of Kordelio-Evosmos, in terms of pedestrian infrastructure and public space design, as important parameters that intersect with mobility patterns, thus influencing CIM and children's overall wellbeing. Due to the COVID-19 pandemic, the survey was distributed electronically, via Google Forms, to the associations of parents and guardians of the schools of the area. Answers came from 27 schools in Kordelio-Evosmos, which represent 77% of the area schools. In total, 97 parents completed the part of the survey regarding children's mobility were gathered, while 96 completed the part about the evaluation of the urban environment. The distribution of the schools represented in the survey is shown in Figure 2.

Figure 2. Aerial view of the study area of the Municipality of Kordelio-Evosmos, showing location of schools and/or school complexes that participated in the field survey. Source: www.oikoskopio.gr, authors.

The age of children whose parents participated in the survey ranged from 6 to 12 years old, with most of them (77%) being 9 years or over, an age that is considered a threshold for independent mobility (Cunningham and Jones, 1996). No significant difference in gender representation was noticed; girls represented 52% of the total.

The next question regarding distance between home and school revealed that most children (89.7%) live within a radius of 1000 meters or less (Fig. 3). Undoubtedly, distance to be covered is a crucial factor for children's independent mobility regarding school travel. According to Greek legislation, children are distributed in schools so as the maximum distance from home is 1000 metres. The dense urban fabric of Kordelio-Evosmos and the distribution of elementary schools, as well parents' answers, all converge to the assumption that for most children the issue of distance should not have a negative impact on their independent mobility.

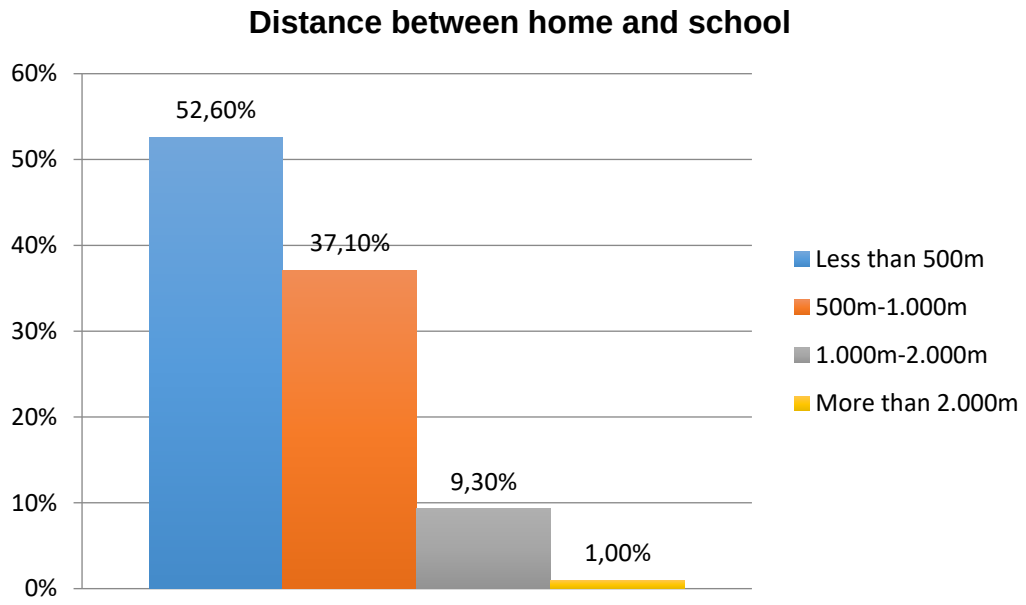

Figure 3. Chart showing distance between home and school, according to parents' answers. The majority of children (89,7%) live within a radius of 1000 meters or less from school.

Despite the short distances, however, only 16 out of 97 children go to school on foot on their own and 13 out of 97 (median 15.4%) return home in the same manner. More than half of children (53%) walk to and from school but accompanied by an adult. One out of three children travel to and from school in their parent's car (median 33.5%). A total of 86.5% of children fail to travel to school independently but rely on an adult to either walk with them or take them to school by car.

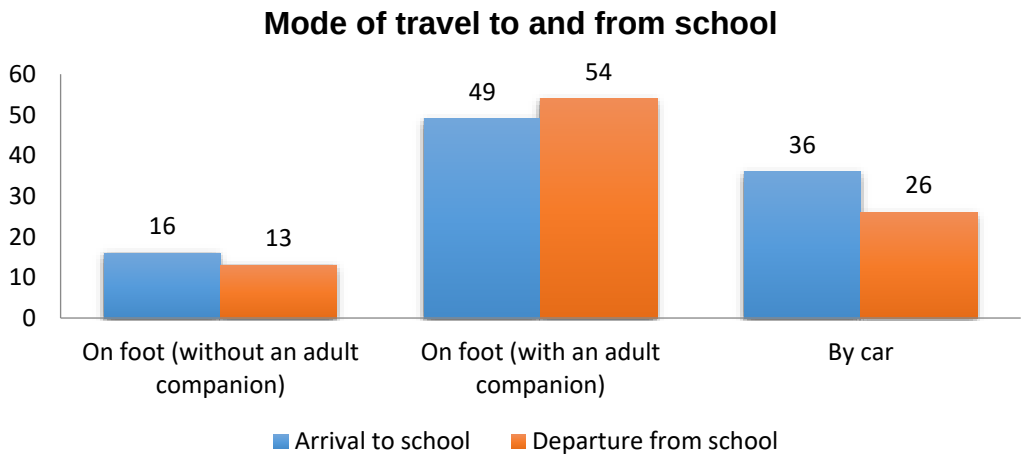

Figure 4. Chart showing mode of children's (N=97) commute to school, according to parents' answers, in the morning and in the afternoon. A very small percentage of children (median 15.4%) do this commute on foot on their own.

When asked whether they regard independent mobility as beneficial for their children, most parents agreed that it has a positive impact on their children's health and wellbeing (Fig. 5).

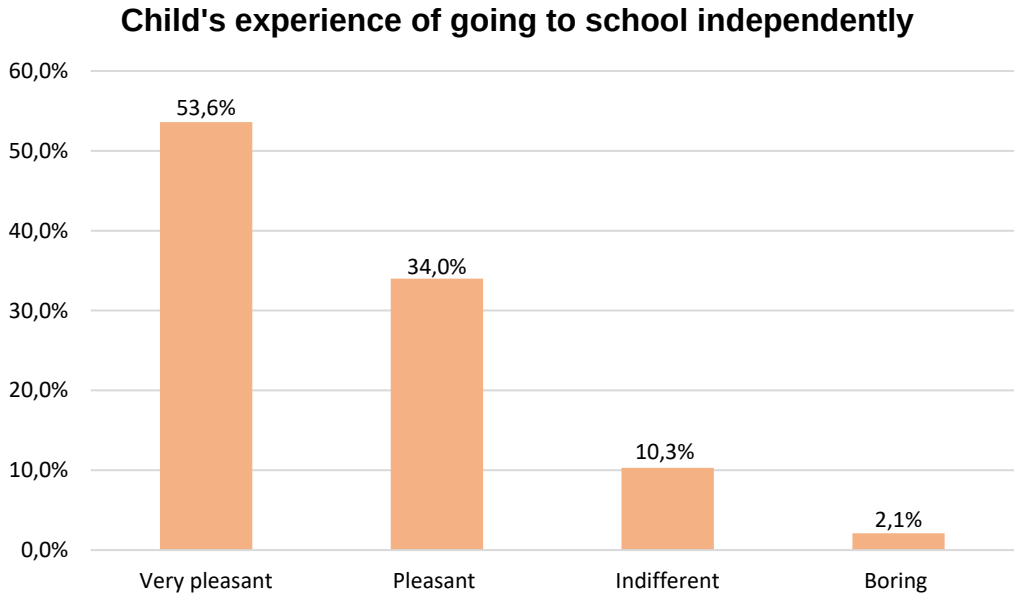

Figure 5. Chart showing how parents characterise their child's experience in case the daily commute to school is done or could be done (if conditions changed) on his/her own. The vast majority (87.6%) think that it is / would be a pleasant experience.

Factors influencing parents' attitudes regarding the ways children travel to and from school include the level of perceived safety (from traffic, from crime), distance between home and school, weather conditions, but also the physical attributes of the urban environment – for example, the presence and

good condition of sidewalks along the route the child has to cover (Fig. 6). In particular, parents pointed out that the major problem is the lack of pedestrian infrastructure (insufficient or even non-existence sidewalks), but also the cars parked on the sidewalks, which not only render the sidewalks impossible to use, thus obliging pedestrians to walk on the road, but also obstruct visibility.

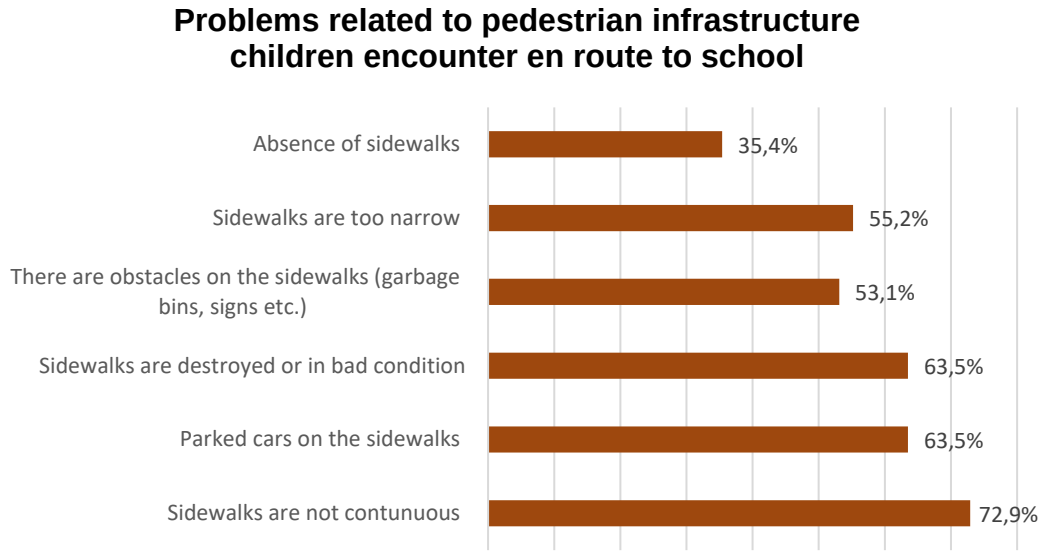

Figure 6. Chart showing parents' opinions about the problems of pedestrian infrastructure en route from home to school.

Factors related to road safety (volume of traffic, vehicle speed, safety at crossroads and crossings, etc.) and to physical aspects of urban space (distance between home and school, presence, and quality of sidewalks, etc.) are considered equally important to "soft" factors, such as presence of school traffic guards, security from crime, from strangers, adult supervision. In fact, the three categories of parameters (traffic/infrastructure/behaviour) show an interrelation among them, as in the case of safety, for example. The perceived need for adult supervision is related to heavy traffic, to the lack of safe crossings, to the absence of sidewalks, etc. The majority of children need to either walk with an adult to and from school, or – even worse – travel to school on the back seat of a car, due to the shortcomings in the design of the urban environment in providing safe routes for pedestrians – children included.

The second part of the survey included questions regarding parents' opinions about the quality of urban space, in an attempt for a bottom-up evaluation of the built environment of the Municipality. The answers show that most parents are not satisfied with the urban environment of Kordelio-Evosmos. The detailed list of problems by category is shown in Figure 7. When asked about the conditions of their neighbourhoods for walking and for leisure activities, 85.4% replied that these conditions are bad or mediocre. This is due to a host of problematic aspects, such as lack of greenery (76%), poor quality of spaces for walking (49%), insufficient public lighting (61.5%), dirtiness (58.3%), environmental pollution (51%), and an overall lack of public spaces (33.3.%) – thus "painting a portrait" of a city far from being human-scale.

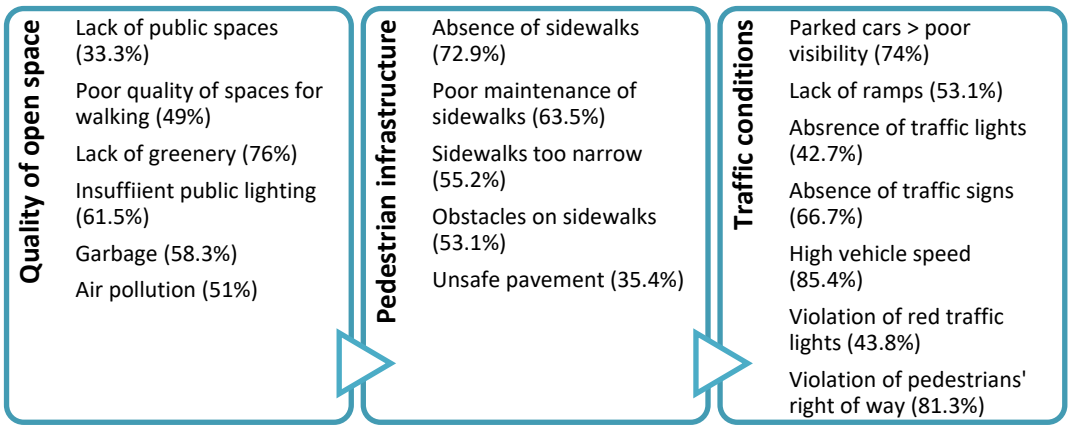

Figure 7. Parents' opinions about the urban environment in their neighbourhoods, regarding three groups of problems: 1) related to the overall quality of open space; 2) related to pedestrian infrastructure; 3) related to traffic conditions.

Problems related to pedestrian infrastructure include poor condition or even absence of sidewalks, narrow pavements, obstacles on the sidewalks etc. – all of which create conditions less than ideal for children to walk. In the third group of questions, when asked about traffic conditions, 79.2% of the parents replied that these are bad and difficult for pedestrians. Drivers' behaviour was judged problematic (93%), as parents reported that there is speeding in residential areas (85.4%), violations of pedestrians' right of way (81.3%), violations of red traffic lights (43.8%), etc. A most compromising factor for pedestrian mobility in general – and for children's mobility in particular – is the attitude of drivers to park partly or even wholly on the sidewalk (reported by 74% of the parents). It shows that enforcement is weak, but also that there is an acute lack of education from the part of the drivers. Illegal parking like this type not only renders many sidewalks unusable for pedestrians but also decreases the visibility of children trying to cross the street, as parents pointed out.

The importance of physical design for mobility choices and attitudes is manifested in parents' answers regarding a hypothetical scenario in which spatial conditions along the route from home to school were altered for the better. In their majority, parents stated that in that case they would be willing to change their attitude towards their children's mode of travel to school. However, even in this scenario, many parents are still hesitant towards change: they express distrust about how these improvements would benefit safety to the degree that their children would be able to make the daily trip to school on their own. It seems that one factor only would hardly make a significant difference. Their decisions are based on many factors, therefore a proposal for the improvement of conditions for children to walk on their own would have be holistic and include a variety of measures, for example, a combination of redesign of the physical infrastructure, such as safe sidewalks and crossings, combined with enforcement of responsible drivers' behaviour, lower speed limits etc.

At the same time the survey took place (June 2020), in one of the elementary schools, a teacher contacted a photo-essay project, called "Let's go for a walk," asking participating students to take pictures along the routes they travel to and from school. Thus, we also have pictures, taken by school students, that illustrate very clearly the problems regarding pedestrian infrastructure in Kordelio-

Evosmos. The children document the absence or interruption of sidewalks as well as the "occupation" of sidewalks by parked cars (Fig. 8). This ethnographic approach compliments our research, and it could be a powerful tool for bringing the issue of CIM in the forefront of public discussion.

Figure 8. Two pictures taken by elementary school students in Evosmos, during the project "Let's take a walk," organized by their teacher, Mr. Efthimios Skoufis. Source: E. Skoufis's archive.

4 Discussion and Contributions

Whether children commute to school on their own or not is influenced by a host of factors, both personal / social and environmental. Parameters related to the child and his/her family (age, gender, family structure and daily routine, socioeconomic status, cultural attitudes) come to play and influence parents' choices on their children's mobility. While acknowledging these factors, the study focuses on the quality of urban space, in particular the quality of infrastructure for pedestrians, as a determining factor for children's mobility. To test this hypothesis, a field survey based on the SRTS questionnaire (United States Department of Transportation, 2004) was conducted, to both gather quantitative data on children's commute to school (age, distance between home and school, mode of travel etc.) as well qualitative data on the main problems related to the urban environment along the route of this commute, according to parents' opinions. The second part of the questionnaire focused on parents' evaluation of the urban environment in general, thus providing the opportunity to relate the problematic conditions for children to walk on their own with the overall quality of urban space.

Given the scarcity of research on CIM in Greece, this study first and foremost provides a set of data on how elementary children commute to school in a densely populated and compact urban environment such as Kordelio-Evosmos. Very recently, Kotoula (2021) has provided related data on how children travel to and from school in different districts within the Greater Urban Area of Thessaloniki. In her study, most important factors determining parental attitudes towards their children's commute are the age of the child (79.7%) and the distance to be travelled (75.9%). A significant difference is observed between Kotoula's study and ours: while in her research only 60.7% of children live within a radius of 1000 meters from school, in our study this percentage is 89.7% in the case of Kordelio-Evosmos. This deviation shows the need for more research on the issue, in different areas and different typologies of urban development, to have sufficient data for comparison, as well as cumulative results at a national level. That would allow for a comparison of the situation in

Greece with other countries. From the results of this limited field study, however, we conclude that CIM in Greek compact cities such as Kordelio-Evosmos is very constrained. This is counterintuitive to the fact that, because of the compact character of the urban environment, distances between home and school are very short (less than 1000 meters). Despite the short walk needed (less than 10 minutes), we found that a large percentage of children aged 9 years old and over (thus totally capable, in terms of physical, cognitive, and emotional maturity, of getting around on their own) are being accompanied to school by an adult or driven to school by car. This finding is important in relation to the recent discussion of proximity and the concept of the "15-minute city" (Moreno et al, 2021). It is an indicator that in Greek compact cities, such as Kordelio-Evosmos, although there is proximity, often physical conditions are adverse for walking or biking, thus leading to unnecessary use of private cars.

The choice of Kordelio-Evosmos for our field study was based on the fact that, as mentioned in the beginning, the Municipality of Kordelio-Evosmos is one of the "youngest" in the country, with almost one out of five inhabitants belonging to the age group of 0-14 years. Therefore, the issue of CIM is even more urgent and relevant for this city and, in our opinion, it should be prioritised by authorities and citizens. One would expect, given its demographic profile, that Kordelio-Evosmos would offer plenty of good public spaces for children, along with safe conditions for walking. The results of the survey show that parents of elementary school children evaluate the conditions of the built environment negatively, not only for their children but also in terms of overall quality of urban space. Indeed, based on the findings of our research, the living conditions in the Municipality of Kordelio-Evosmos are characterized by all three negative indicators, which according to Gilbert et al (2017) have a negative impact on children's wellbeing, that is a) heavy traffic; b) lack of spaces to gather; c) lack of multitude of activities.

A surprising outcome in our study is that parents' answers showed very clearly that the physical characteristics of the urban environment (dense urban tissue, lack of open spaces and poor design of pedestrian infrastructure) are unfortunately combined with antisocial and life-threatening behaviour of drivers. Illegal drivers' behaviour, such as illegal parking on sidewalks, violation of speed limits, violation of pedestrians' right of way, are making the urban environment unsafe and unfriendly for children, obliging parents to accompany them to school on foot or to drive them around by car. As in the SRTS program (United States Department of Transportation, 2004) a holistic approach needs to be adopted, that would include all four E's, as proposed by SRTS: Education, Encouragement, Enforcement and Engineering. For a better environment for children, the city should invest on pedestrian infrastructure, in parallel to measures related to drivers' behaviour such as strict enforcement, education etc. A more child-friendly city is a human-scale city, where cars are not allowed to take over streets, sidewalks and put pedestrians in danger via careless, illegal behaviour. Our intention is to continue this study and to disseminate the results so that awareness of the problem is raised in the local community; it is important to instigate public demand for an integrated response, with school communities at the centre, as in the successful SRTS program.

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Acknowledgements

This study would not have been possible without the kind participation of the parents who answered the survey. We are grateful to them all. We also deeply thank Mr. Efthimios Skoufis for the permission to use the pictures taken by his students.

Spatial dimensions of everyday life from a gender perspective - Porto as a case study

Jéssica Machado
PhD candidate in Faculty of Architecture of the University of Porto (FAUP)
e-mail: nardy.arq@gmail.com

Gender inequality is manifested territorially. Scientific evidence points out that the structural configuration of the built territories is not neutral and does not respond effectively to the demands of socio-spatial exclusion of different social groups. Ensuring a dynamic of change so that the urban space is effectively safe, fair and representative for women is part of this necessary advance.

The research proposal uses transdisciplinary tools and concepts to analyse the interconnectivity between these urban and social phenomena, with spatial justice and intersectionality as guiding axes. It is intended to recognize and clarify aspects related to the spatial dimension that are determinant in the experiences and daily lives of women who live and circulate in the urban context of proximity, regarding the life support functions, such as housing, mobility, and leisure. Specifically, how such collective elements respond to the particular requests made to women, in view of their social roles.

Methodologically, based on the analytical category of gender, it relies on a systematic review of the literature and quantitative and qualitative techniques. Namely, systematic observation, mapping, interviews with men and women and focus groups; applied to the case study, in Campanhã area, in the eastern part of Porto. From the territorial point of view, it's highlighted that the choice of the referred sector is due to its urban and territorial insertion, the population and uses diversity it presents, constituting an environment prone to diverse narratives and points of analysis about its socio-spatial factors and dynamics.

Keywords: Porto; urban studies; gender perspective; intersectionality; spatial justice

1 Introduction

Based on the research's guiding question "What is the city like when viewed from the gender perspective?", this article is developed from the connection between urban studies and the gender perspective, having the Eastern zone of Porto and the area of Campanhã, in Porto, as the territory of choice for empirical investigation.

Based on "counter-hegemonic" works and theoretical contributions from other disciplines, this theme of study focuses on the practical and everyday experiences of women in cities to, among others, reveal inequalities (Tavares 2015, Pölleritzer e Andreas 2013) and how and why their *right to the city* – as a collective right rather than individual (Lefebvre 2001 [1968]) - is constrained in order to achieve gender equality in all its dimensions; and fairer and more democratic cities for all.

The present article is divided into, in the first part, a presentation of the key points for developing the proposed theme, justifications for focus on the experience of women in an urban dimension. The second part is focused on the ongoing research: the intellectual path for developing the question, the objectives, the theoretical framework through which the territory is analysed in empirical research, the methodology under development and also some aspects of the progress achieved so far.

2 The theme: Urbanism at the perspective of gender

An important starting point for this reflection is to consider the built environment from its inescapable social and political constitution, taking into account that "*our built or created environment is made in accordance with a set of ideas about how society works, who does what and Who goes where*" (Matrix 1984). And, therefore, "*the city is the projection on site of an entire society*" (Lefebvre 1974 [1991]). In this sense, it is clear that social gender relations are also inscribed in the spatial structures and that the analysis proposed by the theme places people, their experiences and the quality of their lives at the centre of the debate.

Peake (2017) emphasizes that although feminist scholars do not agree on the extent to which the city is liberating to women, they do agree that 1) women's disenfranchisement reaches deep into the urban; 2) women form heterogeneous groups (which communicates with the concept of "*intersectionality*" discussed ahead), and 3) women's and men's experiences of the urban differ. All of these items are directly related to gendered relations of power and sexual divisions of labour affirmed historically and statically.

The main building blocks of this theme are "*women*", "*gender*", "*the intertwining of the public/private spheres*", *social reproduction/production* and *gendered violence* (Peake 2017).

2.1 The relevance of the theme

Despite the progressive consolidation as a fertile field of discussion and the fundamental role of expanding the critical repertoire in urban studies, there is an urgent need to produce and share knowledge from this point of view. This urgency is clear since the problems and questions have been raised since the 1980s, for example, with works such as the seminal book of essays produced by the English group of feminist architects and urbanists Matrix (1984), "*Making space: women and the man-made environment*". Such problems and issues, to a large extent, extend to the present day and are developed by the intense production of recent works such as the book by Canadian geographer Leslie Kern (2019), "*Feminist City*". That is, questions raised more than 40 decades ago continue to be elaborated which proves the historical persistence of problems and their relevance.

In general, essays continue to be written about the possible affinity between gender and urban studies and ways in which previously gathered information has been distorted by androcentrism continue to be discovered.

The historical scope and persistence of problems also expose the existence of gaps in knowledge and the recognition of the fundamental role of women in space and urban life.

For example, there is a lack of knowledge about how the urban contours of the 21st century, marked by economic crisis and social uncertainty, are serving to reconfigure gendered urban inequalities or their impact upon "*women's right of the city*" issues that speak to equity and belonging. In particular, regarding urban policy, migration and capital accumulation in a global scale (Peake, 2017).

Figure 1. Relevant books on the subject of urbanism and gender published over the years, from right to left: In 1984, *Making space: women and the man-made environment* from Matrix / In 1994, *Gender planning and development. Theory, practice & training* from Caroline Moser and *Women and Planning: Creating gendered realities* from Clara Greed / In 2018, *Mujeres, casas y ciudades: Más allá del umbral* from Zaida Muxi / And, finally, in 2019 *Feminist City* from Leslie Kern.

The sociological framework focusing on women is justified:
1) *statistically*, as they devote more time to all care responsibilities (Madariaga; April 2021)
2) *historically*, due to the social and cultural constructions imposed on sexual bodies from the entirely social creation of ideas about the roles proper to men and women (Scott, 1988**;** Montaner and Muxí 2011). That is the construction of gender as a basis for *meaning systems*, which societies use to articulate rules of social relations or to establish meanings to experience (Scott, 1988).
The building of genders is then based on hierarchies and exclusionary organizations upon the patriarchal structure in which each role matches a space. In this sense, the public subject of the city is what we know as the “men” (Montaner and Muxí 2011).
According to Kergoat (2003), the sexual division of labour in the capitalist mode of production determines that men take on productive and salaried work and produce goods and services. Meanwhile women take the domestic and unpaid reproductive work, aimed at activities of care and reproduction of life, marking the routine and “affective” connection between women and the domestic sphere, the repetitive gestures, and the daily acts of maintenance of the home and the education of children.
This discussion gained relevance with the increased awareness of the collective oppression regarding women and the different natures of work and daily activities. It is relevant to say that from the 1970s onwards, the subject started to be approached from an intersectional perspective, considering the entry of women into productive work and their participation as a workforce since

before their incorporation into the industry. In this scenario, productive and reproductive work in women's life are then considered as cumulative - double and triple shifts (Kergoat, 2003).
Ongoing social changes in the reproductive and productive spheres and divisions force us to rethink the traditional and unequal distribution of loads between women and men. And the need to recognize reproductive work socially and economically.

Figure 2. In this matters, American artist Miele Ukelis explored maintenance as art by documenting her labor in the home and as a mother, including repetitive everyday tasks as a way to raise awareness to the importance and difficult of care work. In the series of photographs "Dress to Go Out/Undressing to Go In" (1973) she provides a moment-to-moment account of the task of dressing and undressing the children.

Thus, with women's roles historically defined as the main caregivers and statistically proven nowadays, women's urban experiences are configured as more complex and, if looked at carefully, show alternative narrative threads that encourage new interpretations of urban space (which can be enlightened by the concept of "*care work*" discussed ahead).
Furthermore, these situations are not always attended by the current urbanization and the traditional model. This model was founded on an intimate connection between the development of capitalism and urbanization and places the urban space as a key-element in the process of capital accumulation and profit production (Harvey 2013). In addition, this model also imposes patterns of segregation and violence on specific social segments when it attends, mainly, the productive needs (Brenner 2018). For example, in most urban spaces, the frequency and quantity of buses are higher in commute to and from standardized working hours and during weekdays.
This situation compromises the equality of opportunities in the urban space, based on the difference of experiences and, therefore, of demands. It also compromises the *right of the city* (Lefebvre 2001 [1968])**;** Harvey 2013) which has at its core the fundamental idea that inequalities and oppression, as racism, gender inequality and LGBTphobia, are determinant and determined in the production of space.

3 Developing the Question

A starting point that contributes to looking at the various dimensions and social practices produced in the city is due to the need for several lenses to understand the dynamics of urban territories in their complexities and the need for analysis tools that allow us to address the diversity of existing situations.

It is supported by approaches from the critical urban theory, as opposed to mainstream approaches, that are concerned with examining the changing balance of social forces and power relations that shape and are shaped by the evolution of capitalist urbanization. And with exposing the marginalization, gendered exclusions and injustices inscribed and naturalized in urban settings through spatial practices and ideologies (Brenner, 2018).

Thus, it is intended to analyse with a close look 3 key relationships: 1) location and structure of urban space and quality of women's life at the urban space; 2) structures and breakdowns of standard and structures and quality of women's life at the urban space; and 3) structures and breakdowns of families and quality of women's life at the urban space.

3.1 Objectives

The objectives of the investigation are 1) deepen knowledge about the Eastern Porto zone/ Campanhã zone and about the life of women in the territory through the construction of new perspectives and new narratives about the territory; 2) Reveal clues about how the area fulfils cultural, health and access to the right to the city expectations; and also possibly identifying emerging issues; 3) Develop a critical urban discourse capable of raising awareness about the structures of oppression in order to build a more equitable city and society; and 4) Make the gendered elements of city life more visible.

3.2 Theoretical frameworks

The concept of *situated knowledge* (Haraway 1988) stands out as theoretical framework that guides the investigation because it questions the power relations at play in the processes of knowledge production. It criticizes the distancing of the subject and the object in its production of all kinds of knowledge, since this distancing suggests the existence of a 'universal' position that has ethical and political consequences. Namely, it puts all other positions as invalid and subjective and thus, denies subjectivity and presence (Rogowska-Stangret, 2018).

Furthermore, it holds the idea that knowledge stands from a partial perspective and through the metaphor of vision (viewpoints, eyes, seeing) the author seeks to develop criteria for what counts as knowledge as it always reflects the conditions in which it is produced. And, at some level, reflect the social identities and locations of knowledge producers.

Peake (2017) on what she calls the "*feminist mode of situated knowledge*": it engages with both the limits of urban theory and the urban as a site of everyday living and working struggles, embedded in which are hopes for a better future and open to possibilities to bring a broad view of the city.

In this sense, Rogowska-Stangret (2018) also states that "*feminist situated knowledges*" open themselves for new forms of knowledge production and on an epistemological level it is an effort to think outside the duality of objectivity-relativism.

Having said that, it is possible to say that the concept of situated knowledges connects with the concept of intersectionality, coined by critical race theorist Kimberlé Crenshaw in 1989.
This concept is based on the premise that gender experiences are not fixed and varies according to the articulation of power relations in different social categories of identities - like gender, race, sexuality, class, age. The idea is that the interconnections among them are potentiated as means of oppressing women and marks their urban lives and experiences (Collins 2016, Crenshaw 1989).
Another anchor concept of the investigation is that of care work (Madariaga 2013), considered a gender-aware concept in transportation planning and that highlights the aforementioned idea of gendered divisions of labour. It aims to provide a better understanding and inform urban planning about travel patterns of women and men, by considering travel implications of daily tasks performed by individuals with care responsibilities. Which makes it necessary to quantify, access and make them visible.

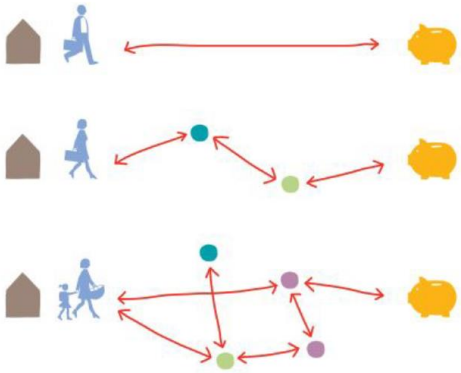

Figure 3. The diagram shows the difference in travel patterns of women and men from Col.lectiu 6 (Interdisciplinary Cooperative of Feminist Urban Planners from Barcelona).

Thus, the research question "*What is the city like when viewed from a gender perspective?*", analysed from these concepts, suggests that thinking about the city taking gender into account means giving priority to everybody's everyday needs and activities. The gender lens puts people's needs at the centre of decisions and takes into account all activities from the productive and reproductive sphere. Particularly the needs of those who depend most on the surrounding conditions, on the public and the collective to develop their daily lives (Madariaga and April 2021) which leads to the recognition that the experiences of women in the city cannot be dissociated from the intersections between the public and the private (Peake, 2017).
All activities, despite the differences of their nature, have a spatial and temporal dimension that imply a place where they take place and a time of the day or week in which they take place. It is precisely at this point that the gender issue meets the technical skills of urbanism, since through planning it is determined where the different activities are located, but also, the physical and economic accessibility to basic equipment and services. And other important elements as location, use, means and transport. These technical decisions shape the environment and the way people live.

So, in addition to a category of analysis (Scott 1988), gender is also a tool to achieve as equal opportunities and sustainable development at the social, economic, and environmental spheres of the territory (Madariaga and April 2021).

4 Developing the Method

The development of the methodology is composed by methods from urban research with lenses from gender perspective that marks it by crossing of different forms of language and apprehensions of reality. The techniques used are, namely**:**

1) *Systematic observation*, in order to establish a first contact with the study territory, systematize the information collected, perceive the true meaning of the facts and the relationships that the investigation proposes. It is the ongoing part of this investigation at this moment, still in its early stages, by the choice of strategic points to check the sustainability of the actions and actors observed and allow a broad and diverse view of this territory.

Figure 4. Area of Campanhã, in Porto. The map shows the strategic points where observations have been made for identification of patterns, analysis categories and dimensions of where women and their behaviours predominate geographically. (Map produced by the author, 2021).

2) *Mapping activities*, in order to establish geographical relationships, identify situations that may be outside the study area, but have consequences and expression within and vice-versa and understand the scales that the subject requires.

Based on information produced from the observation and oral reports, the maps will connect the history of the territory to women's memories, in a quest to understand visually the routine and hours lived daily.

3) *Interviews*, to confirm observations from the interviewee's point of view and to cross-reference information. The group to be interviewed involves residents, woman's that use or work in the territory,

and men and women that work and study the territory like urban planners, social workers and others researches.

4) Possible additional method**:** *focus group.*

4.1 Why this area?

The choice of this specific area of study is due to its significant evolutionary characteristics and historical processes, which culminate in a relevant diversity of uses, residents, social classes. The existence of ongoing strategic projects to affirm the area as a new centrality, for example the project of the Matadouro do Porto as a cultural space and the new intermodal station of Campanhã. The proximity relationship of the territory established with the rest of the city of Porto. And also, the existence of spaces with great unexplored potential for leisure and other relevant functions to structure of everyday life.

4.2 The Area Structure

As a way to frame and approach the area, the Eastern area of Porto stands out, specifically the area of Campanhã and surroundings. This area faces the municipality of Gondomar from the east to the south, to the North by the parish of Maia and by the West other parishes of Porto, Paranhos and Bonfim.

The parish of Campanhã has relevant natural resources and green spaces with values, whether historical, sociocultural, symbolic, or imposing in nature.

In addition, it is relevant to mention that the parish of Campanhã has gone through numerous relevant historical processes, for example, since the beginning in the century XIX, the industrial boom that had spatial repercussions in the city and configured a notorious expansion to the east (Rodrigues, 2004).

Nowadays, the configuration of the space is marked by disorganization and spatial fragmentation. For example, there are rural farms cut in half by rapid circulation routes, old forests cut off from their ecological nature among recent construction. The territory is, therefore, a stage where two models, two movements intersect and collide, between a rural reality product of a long-term historical process and a late, potentially rapid and aggressive urban-industrial reality (Silva 2019).

Recently, in April 2019, the Eastern Zone of Porto deserved special attention from the Porto City Council, which considers the physical, economic and social regeneration of this area as one of the city's political priorities. This attention is manifested by the efforts to affirm the area as a centrality and attractive for investments manifested trough the strategic *Masterplan for Porto Oriental*. It is committed to a set of new programmatic instruments for urban rehabilitation (for example, ORU de Campanhã-Estação and ORU da Corujeira) and new projects, in progress or scheduled, with great relevance (Silva 2019).

In summary, the Masterplan for the Eastern Zone of Porto is an essential instrument to promote improvements and solve problems of a territorial nature.

5 Some aspects of progress

It is still not possible yet to draw final conclusions on the research because the investigation is still ongoing. However, it is already possible to confirm some of the relations proposed by the clues that the theory reading and the process of observation have provided.

Namely, it confirms the need to look at the correlations between public and private spaces and gender issues. That is, at the evolution and nature of dynamics observed beyond the so-called *neutral* perspective and the hegemonic models of analysis to guarantee an integrative vision and understand the spatial repercussions of inequalities. There is also the assertiveness of the methodology being drawn and the nature of the information being obtained. Lastly, the necessity to raise awareness and interest for this theme and its implications in all spheres of research and action.

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Should 30% of a city population be excluded?

João A. Gonçalves
Affiliation: Instituto Superior de Engenharia de Coimbra – IPC
e-mail: jarmando@isec.pt

Youth population in cities can rise up to 30% (much more in some parts of the world). Still, they are normally not included in the decisions that affect them in the places they live in. Spaces and activities can be planned "for them", but rarely "with them". The reasons for that are several, from the socio-cultural context to the governance framework in place, which includes the nature of the processes, the institutional infrastructure, the type of language that is used (even if participatory processes are set up), or the lack of experience of those making decisions in dealing with children and youth.

To involve children and youth in decisions with long lasting impact is not only a matter of social inclusion, but also a step towards more sustainability since the future generations can start to be included from now and share the decisions that are being taken. This paper aims to contribute to answer the question: "What kind of initiatives can be taken at local level, especially in the municipal government, in order to ensure that children and youth are not left behind when it comes to city production?"

Keywords: youth, cities, inclusion, governance

1 Introduction

Complexity, uncertainty, social fragmentation, environmental emergency, connectedness, political representation, responsible economy; these are just some of the terms that came to the agenda of those who have the responsibility to govern societies and territories in the last 20 years.

The pace of change and the degree of complexity experienced in communities and territories, together with an increasing awareness and access to information from the citizens, makes no longer possible, neither desirable, to have strictly hierarchical and centralized structures of government.

The above-mentioned factors, among others, forces a transition towards a governance mindset, in which different stakeholders are welcome and have a contribution to overcome current social, economic, and environmental collective challenges. In that transformation, the Government (from national to local) that traditionally plays the role of "command and control" through a set of rigid vertical structures, becomes the coordinator, mediator, and mobiliser, in a (mostly) horizontal network of public and private stakeholders, gathered around a common collective vision (Ferrão, 2011).

The understanding of what the term *governance* means has received many contributions, with different focuses. One of the initial definitions, by Jessop (1995), states that

"(…) one could define the general field of governance studies as concerned with the resolution of (para-)political problems (in the sense of problems of collective goal-attainment or the realization of collective purposes) in and through specific configurations of governmental (hierarchical) and extra-governmental (non-hierarchical) institutions, organizations, and practices." (1995:317)

Other authors have put more emphasis on other perspectives: the network of stakeholders and its mechanisms of operation (Rhodes, 1996, 2007; Booher and Innes, 2002), the social capital element

(Putnam, 2000), the role of the government structures (Le Galés, 2001), or the process of involvement and dialogue (Garcia, 2006), the collective action in the public sphere (Healey, 2006), among others. Finally, the importance of the transition to a *governance* mindset in a turbulent world is well illustrated by Kearns & Paddison (2000) when mentioning the benefits of collaboration and sharing of talents and resources:

"Governance is about the capacity to get things done in the face of complexity, conflict and social change: organisations, notably but not only urban governments, empower themselves by blending their resources, skills and purposes with others." (Kearns & Paddison, 2000: 847)

2 Opening government to other actors

Accepting the fact that different stakeholders are now players in the public sphere, the literature traditionally organizes them in three main groups that constitute the governance triangle (Figure 1): the State, the Private sector and the Civil society (Swyngedouw, 2005; World Bank, 1997)

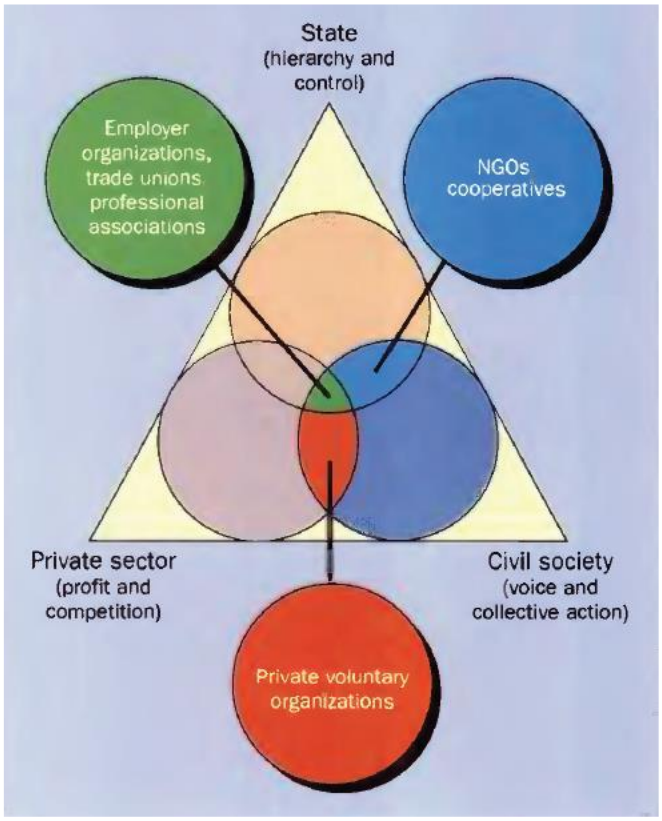

Figure 1. The Governance triangle (Source: World Bank, 1997)

The weight of these three sectors are not the same, depending also with the context (social, cultural, economic). The State continues to have a central role (even if a new one, more proactive and open), but the importance of the other two varies. In societies in which the free market has a key role in the development, the private sector is a major player and can influence decisively the public policies. Its importance is undeniable.

But the influence of the opinion of the public and its will to be involved in the decision-making have been gaining momentum as we can confirm by the several social movements that took shape in different parts of the world, from the Arab Spring to the grassroots movements in Latin America, or the pro-democracy initiatives in Asia. And if the lens focuses on the local level, one can identify many expressions of this urge of involvement from the civil society in the issues that directly affect them in their communities, being through individual participation or through organized groups.
The benefits and pitfalls of public participation are well documented, and the summary done by Irvin and Stansbury (2004) provides a fair view of the main aspects to consider when thinking about open the processes to public participation. (Table 1)

Table 1: Advantages of Citizen Participation in Government decision-making (Irvin e Stansbury, 2004)

	Advantages for participants	**Advantages to government**
Decision process	Education (learn from and inform government representatives) Persuade and enlighten government Gain skills for activist citizenship	Education (learn from and inform citizens) Persuade citizens; build trust and allay anxiety or hostility Build strategic alliances Gain legitimacy of decisions
Results	Break gridlock; achieve outcomes Gain some control over policy process Better policy and implementation decisions	Break gridlock; achieve outcomes Avoid litigation costs Better policy and implementation decisions
	Disadvantages for participants	**Disadvantages to government**
Decision process	Time consuming (even dull) Pointless if decision is ignored	Time consuming Costly May backfire, creating more hostility toward government
Results	Worse policy decision if heavily influenced by opposing interest groups	Loss of decision-making control Possibility of bad decision that is politically impossible to ignore Less budget for implementation of actual projects

Being mindful of these advantages and disadvantages is important since the adoption of more participatory practices in governing a territory or community seems inevitable. But the new role of the Government in a *governance* mindset is not only to accept the contributions that can rise spontaneously, but to encourage the active participation, to guide the process (in order to make it meaningful and effective), and to ensure that all those concerned have the opportunity to contribute.

2.1 Children and young people: why bother?

At this point, one could ask "Who are all those concerned? Should this include children and young people? Why?" Several reasons can be presented for that.

In the **first place,** one can mention the size of this particular group when compared with the entire population. If we focus on the persons under the age of 19, we can see (Figure 2) that, even if the evolution has been decreasing, the number is still significant: from 40% in the year 2000, to 33.3% in 2020.

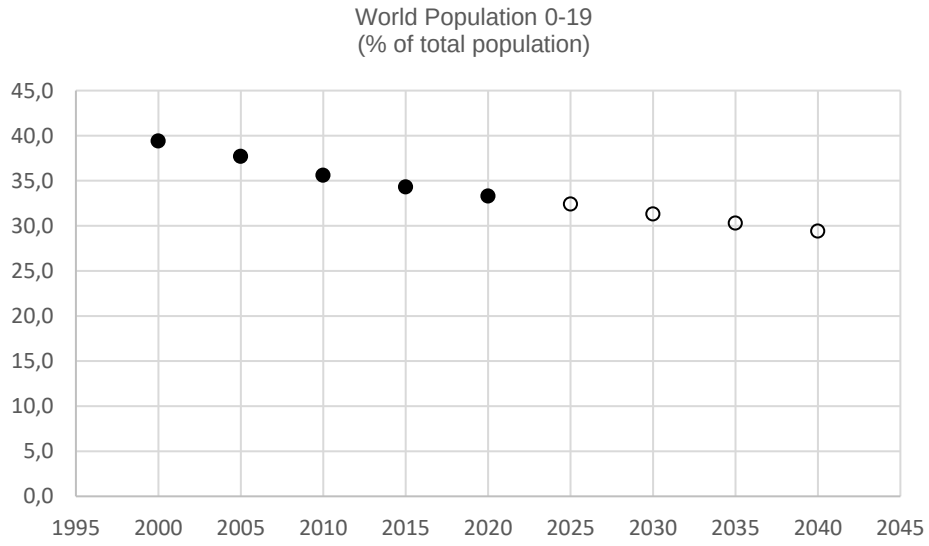

Figure 2: Percentage of world population aged 0-19 (Source: World Population Prospects 2019, UNDESA https://population.un.org/wpp/DataQuery/)

Moreover it is important to note that the number of children living in urban areas has been increasing too, following the general trend of concentration of population around urban areas and consequent growth (Figure 3).

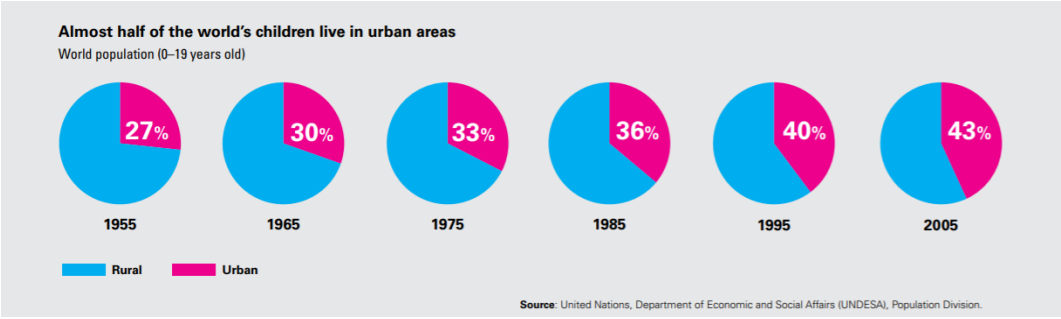

Figure 3: Children living in urban areas (Source: The State of the World's Children 2012: An Urban World)

This is particularly important when it comes to planning urban spaces: children are users of the city, in their particular way, which is not the same as adults do, but not less important, from a different of perspectives.

This brings us to the **second** reason, which is a matter of inclusion. One may wonder if children and young people can be considered stakeholders in a governance framework. Swyngedouw (2005) mentions the approach proposed by Schmitter (2001) in which he expands the concept of *stakeholder* to that of the *holder*, being this one the basis for establishing the right to participate (Table 2).

Table 2: Citizens has holders – reasons for participation

Holders	They participate because…	Profile
Right-holders	… they are members of a national political community	Citizen
Space-holders	… they live somewhere affected by the policy	Resident
Knowledge-holders	… they have particular knowledge about the matter concerned	Expert or keeper
Share-holders	… they own part of the assets that are going to be affected	Owner
Stake-holders	… regardless of their location or nationality, they might be affected by change	Beneficiary
Interest-holders	… they do it on behalf of other people because they understand the issues	Spokesperson
Status-holders	… they do it on behalf of other people because they are given a specific representative role by the authorities	Representative

Source: Author, based on Swyngedouw (2005) e Schmitter (2001)

Although this approach was conceived for a broad context as the European Union, the concept can be transferred to a more limited scale, like a city or a neighbourhood. And in fact, one can recognize that the same person or organization can have "different hats" simultaneously, as a holder. For example, an owner of a building situated in a zone which is going to be under renovation can be considered as holder of rights, space, share, interest, etc.

The interest for this approach for children and young people is that they can be seen as holders too: of rights (as persons), of knowledge and space (they have a particular kind of knowledge of the spaces they use). And they can be considered stakeholders or even shareholders (in the sense mentioned above).

And the **third** main reason is a matter of sustainability. Any decision taken now, in terms of planning, most likely will have far-reaching implications for the following generations (Frank, 2006). As Chawla (2002) rightly points out, this touches the very essence of the concept of sustainable development. In fact, when considering the traditional Brutland Comission definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987),

one should note that part of the *future generations* are already born, and they coexist with adults in their daily lives, both at home and in the public realm. Their involvement at this stage is already a matter of co-responsibility and can be seen also as a training for full citizenship from the early ages.
The literature identifies a number of other benefits of involving young people in the collective decisions and processes, such as planning processes; benefits for the young people themselves, for planners and policy-makers, and the community at large. These include a better knowledge of the community and the democratic processes, acquisition of new skills and fresh views, development of wider citizenship spirit and a stronger sense of community, better informed decisions, more inclusive mindsets, etc (Driskell, 2002). Tonucci and Risotto (2001) even mention young people as being "sensitive environmental indicators" meaning that if we take their opinions and wishes in consideration, we will be meeting the entire community's needs as well. Weston (2010) argues that young people should be the citizen for whom cities are designed because the area of the brain related to spatial perception and analysis is still developing in them. However, despite all the benefits that are recognized, there is still a great need for studies that document the long-term effects of children's participation (Knowles-Yánez, 2005)
Actually, the understanding of young people as citizens today (and not only in the future) is of crucial importance to make that effort of bringing them to the table when planning or improving the spaces. As Simpson (1997) refers, the manner in which young people are viewed has historically hampered their inclusion in the process of planning and urban design. Seeing them as competent citizens who can create community change (Checkoway & al, 2003) is still an unusual starting point and challenges the predominant views of children as "adults-to-be" (Torres, 2010).
Changes are needed not only in terms of mindset but also in terms of processes and structures. In what relates to planning and the inclusion of youth concerns, processes and methods continue to be legalistic, reactionary and dominated by economic interests (Knowles-Yánez, 2002, cited by Frank, 2006); certainly not very youth-friendly.

3 The necessary changes

"To develop and implement programmes of action and participatory initiatives that are practical and meaningful for children and young people demands that those in local government understand, are committed to, and are prepared to develop good practice in working with children and young people." (Freeman e Aitken-Rose, 2005)

The inclusion of children in planning and management of communities (namely their spaces but not limited to them) must be seen in a more general context related to the role they play in the community and the participation they have in its construction.
It is not just about having their contribution to a physical planning exercise; this must reflect the response to social, cultural, economic, environmental, and other needs, ambitions, and challenges. The inclusion of young people in planning must therefore be seen in its broadest sense: participation in the collective effort to define these needs, ambitions, and challenges, and to seek solutions.

3.1 Domains of intervention

The obstacles to a more meaningful and effective participation of children and young people in the life of their communities are normally classified as having two different but interrelated origins: the sociocultural context and the institutional infrastructure. Therefore, if we want that participation to become real, we need to act upon those two domains:

In the institutional domain – intervening at the level of the norms, processes, structures, resources made available, or techniques used (the *institutional* term being used in the sense that Healey (2006) gives to it: "the set of rules, norms and practices that structure the action in a social context");

In the sociocultural domain – working with the adults directly involved (municipal staff and politicians) but also with the children or young people themselves, and even with other actors in the community.

Kudva and Driskell (2009) put forward a model based in five key dimensions in which it is necessary to intervene so that spaces for participation that are effective and meaningful can be created in an organization. These dimensions are the *normative*, the *structural*, the *operational*, the *physical*, and the *attitudinal* (Figure 4).

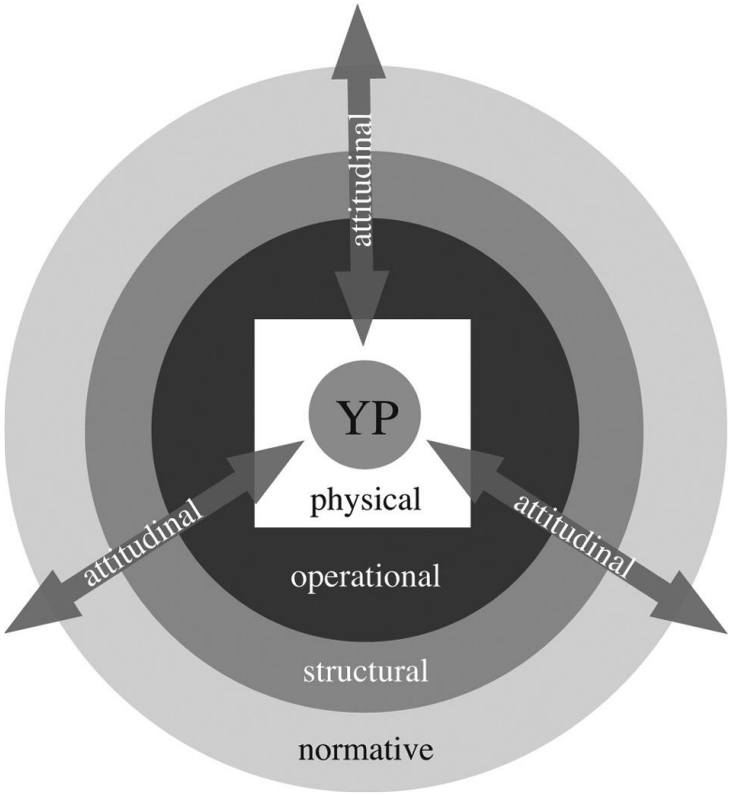

Figure 4: The 5 dimensions of participation as a spatial practice (Kudva e Driskell, 2009)

Intervention in these dimensions is part of the current named *sociological institutionalism* that explores the relationships established between the design of policies and practices of social transformation, and governance contexts (with geographic specificities). It is through the changes

operating in the “institutional infrastructure”, through micro-practices, that it will be possible to change policies and, ultimately, the current culture (Coaffee and Healey, 2003; Gonzalez and Healey, 2005).

i. Intervention in the institutional domain

When working at the local level, the institutional domain is associated with the municipal government bodies and the norms, structures and processes that gravitate in its orbit. Intervening in order to improve the conditions for the participation of young people implies making improvements in this set of aspects.

The first four dimensions of the model by Kudva and Driskell (2009) are directly linked to the organizational/institutional type of context that can limit the possibility of youth participation, that is, the local governance mechanisms in place.

To understand the content of these dimensions, in light of what municipal practices are, can give indications on the type of changes that could contribute to getting young people more involved in planning:

The *normative* dimension expresses the organization's values with regard to young people and their participation, and the degree of commitment to them. It is perceived in the organization's literature, in the discourse of its leaders, or in supports with external visibility (such as the organisation *website,* promotion materials, etc), these being “normative spaces for participation”;

The *structural* dimension embodies the organization's values and is related to the internal organization (the structures in place), the staff, or the programmatic and budgetary priorities. The greater or lesser importance given to young people and their participation can be assessed, for example, by the existence of staff dedicated to these issues, by the allocation of resources for programs or initiatives related to young people, or even by their access to different places in the structure of the organization;

The *operational* dimension relates to the organization's practices and includes the mechanisms that allow young people to have a say in decision-making and management. It is not just about the existence of structures that can even provide for the inclusion of young people; this dimension focuses on how these structures work, how they are effective in engaging young people, and the extent to which they fulfil that mission. It may imply analyses of the functional type (how young people are selected and involved, what is their role in defining goals and agendas, etc.), and also from a political point of view (what real difference do young people's opinions and contributions make);

The *physical* dimension refers to spaces that young people may consider *their own*, whether they are confined spaces (rooms, buildings) or open ones (outdoors). The existence of such spaces is a clear sign of the importance that the organization gives to young people and their place in it. And, at the limit, when the intervention of young people is deeply rooted in all other dimensions, *their territory* is extended to the entire space of the organization.

In this domain, there is some scope to undertake concrete initiatives that contribute to improve the conditions of access of young people to decision-making processes, in general, and in planning, in particular. And this scope is not total because, in addition to the chronic lack of resources, there are constraints caused by the multilevel character of the current governance context, even at the local level. For example, at the *normative* or *structural* level, the options that one wants to make at the

municipal/local level may be pending guidelines or regulations originating at another level (namely, the national).

Despite these potential constraints, changes in the institutional domain turn out to be possible, as long as there is a will (political and technical) to do so. And here the question of prevailing attitudes and culture also assumes particular importance, since the initiatives of politicians and staff end up being conditioned by them.

ii. Intervention in the sociocultural domain

Changes to structures, or processes, are made by people. It is therefore essential that the attitude of the different actors involved is the most conducive to creating the conditions for these changes to occur, either by direct intervention or by inducing other types of transformations.

In the model by Duvka and Driskell (2009), the attitudinal dimension has a transversal character, influencing all others, and is based on the multiple interpersonal relationships in presence, whether those established between adults and young people (and in the way in which they deal with them) as well as among the young people themselves. Being intangible, this dimension is expressed by the type (and quality) of interactions established between young people and adults, which expresses the organization's culture in this domain. We are therefore in the domain of social capital.

Adults play a key role in this process since it is them (the holders of power) that must promote the changes in the above-mentioned institutional dimensions. Therefore, the existence of an effective participation of children and the inclusion of their points of view are conditioned by the existence of a genuine commitment in terms of individual attitudes and the mindset of institutions.

The issue of changing attitudes and the greater or lesser willingness to include the views of young people is critical in the transformation that needs to happen at the institutional level. And there, adults, as *holders of power*, are the main target.

The existence of a *political will* on the decision makers, as well as an open attitude of the other actors involved in the process (mainly technical staff), are basic conditions for any significant change to be made at the more organizational level (Satterthwaite, 2002). It is based on the political and technical availability that changes can be made in aspects such as the existence of specific regulations, the adequacy of consultation and participation processes, or the choice of techniques to be employed in order to guarantee effective participation with results.

The predisposition that can be achieved from the adults (particularly politicians and technical staff) is built on the several participatory *episodes* that are organized, and can be accelerated if these *episodes* include occasions for preparation/training. This will help to adjust attitudes, moving from an initial state of *tolerance* to one of *commitment*, with regard to the inclusion of young people's opinions.

But one should not think that only adults need to be trained to deal with young people and to listen and accept their suggestions. They too must be prepared to interact with adults, understanding and respecting their paths and their reasons. It is therefore a question of enabling both groups to engage in dialogue and cooperation based on an understanding of different aspirations, ways of working, relationships with time, constraints, etc. And that this understanding, in addition to consolidating a sense of partnership, can serve as a basis for taking advantage of the best that each group can bring to the local decision-making process (Mathews, 2003).

On the other hand, it is also necessary to refer to the very issues of the relationships that are established between individuals and the position that each one has in relation to what is collective. The pre-existence of a positive climate of collaboration and sense of ownership within a community, despite not being an essential condition for welcoming the participation of young people, can create more favourable conditions for this to happen. For this reason, dynamics of consolidation of active citizenship end up having positive effects on the involvement of young people in communities.

The qualification of people (children and adults), and the consequent enhancement of *human capital* and *social capital*, thus appears once again as being of fundamental importance in establishing a planning practice that is more participatory and includes young people.

This qualification, or training element, in addition to covering the relational aspect and education for participation, which is common to young people and adults, also has a *technical* component that is different for each of these types of actors:

For young people, the *technical* component can include increasing knowledge of issues and problems traditionally related to planning, which can be done in specific activities carried out in the school or extra-school context. In the first case, this can be achieved through the inclusion of themes in curricular content, through dedicated sessions (possibly conducted by municipal staff), or through extracurricular programs/activities that can be promoted within the school. In the out-of-school environment, programs or projects can also be developed, with voluntary adherence, which are promoted by the Local Government and which aim to increase knowledge of topics more related to planning (in terms of content and processes);

For adults (in particular staff and politicians), *technical* learning will be more related to how to deal with young people (as a particular type of public), and with the processes, structures and tools that will best serve the purpose of including them in planning exercises. This need also exists in relation to the participation of the general public, but it is especially pressing in the case of children and young people, as they constitute a group that, as they are normally far from this type of processes, requires a special methodological approach.

Among the adult actors involved in planning processes, the role of municipal staff (planners, architects, engineers, geographers…) has received some attention in recent years. What is, in the context of collaborative planning, a mediating role, stimulating debate, managing interventions (Healey, 1997), gains special acuity when the target audience is made up of children and young people.

The adoption of strategies for the inclusion of children and young people in planning processes needs (and benefits) from interventions in *institutional* and *sociocultural* aspects in the context in which it operates. The former may be considered simpler to implement (because they depend on practical decisions that one wants to take, namely at the level of local government) but they are dependent on the latter, namely their attitudinal component, without which there no upsurge in practices and in the ways of approaching the subjects will happen.

4 Possible strategies

The choice of strategies to adopt in order to boost the participation of young people in the planning activity at the local level is strongly dependent on the contexts (social, cultural, institutional…), including the *participatory maturity* of the community itself (based on the experience accumulated by the occurrence of more or fewer participation *episodes*).

To facilitate the involvement of young people in planning, there are two essential paths. On the one hand, it is possible to act on the limits imposed by the context in order to create more favourable conditions for this participation to occur: at the normative and structural level, or by providing training to staff and politicians, just to mention a few examples. On the other hand, it is necessary to create real opportunities for this participation to take place, that is, to encourage the occurrence of planning *episodes* to which young people can be called, building their own individual and collective experience. The planning *episodes* can be of different nature and scope, which give them different degrees of complexity. Such complexity can vary 1) with the size of the territory in question, 2) with the time horizon of the exercise, 3) with the interests and actors involved, or 4) with the thematic scope in hand, that is, with a set of factors that can affect the way in which young people are involved.

Strategies that aim to include the views of young people in planning can be diverse and range from the use, on some occasions, of a set of targeted activities designed to gather the contribution of youth, to the full integration of young people in the different regular community activities and, consequently, in the planning activity (understood in the broad sense). Between these extremes there is still the possibility of using combinations of the two approaches. (Figure 5)

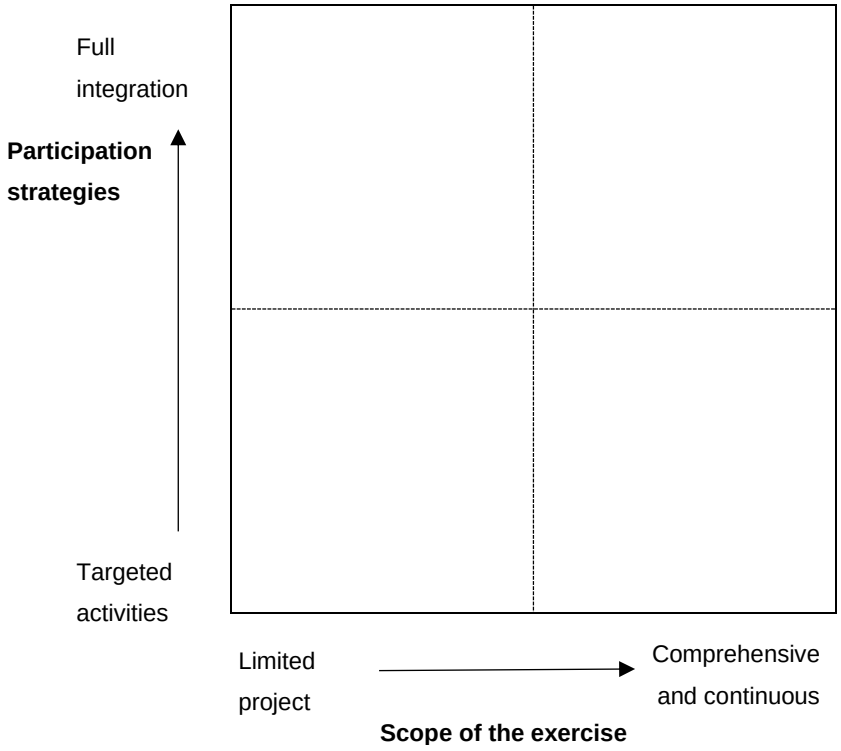

Figure 5. Participation strategies and scope of the planning exercise

The choice of the participation strategy to be adopted (in the case of the intentional promotion of planning *episodes*) will thus be related to the scope of the exercise in question, bearing in mind the level of participatory *maturity* of the community and, in particular, of the young people who want to get involved.

In a community where there is no participation experience, one may want to start by developing a set of targeted activities (for young people) around a limited project. In another one in which the practice of participation is frequent (among adults as well as young people), it will be easier and more natural to engage in a complete integration of young people in the dynamics of participation that are promoted around processes that may be more complex and with a broader scope.

The first approach can be seen as a starting point, while the second one may appear as the ideal situation in a community where children and young people are fully integrated and are seen as citizens. Between these two, various combinations can be tried out, without any particular fixed sequence.

Based on the reflections stated earlier, a set of possible initiatives for involving young people in the planning activity can be identified, which can be adopted separately or in articulation. Such initiatives focus on both paths previously mentioned: the transformation/use of *context* conditions and the use (more frequent and with higher quality) of planning *episodes*. The adoption of some of these initiatives (and others) can contribute to make young people play the *game of participation* within the communities they belong to, including its planning, in the broadest sense. (Table 2)

Table 2. Possible initiatives to involve young people at local level

Paths		**Possible initiatives**
Context	Adult-young person interaction	Intergenerational focus group to debate community issues
		Training occasions for municipal staff on how to deal with children and young people (including the most appropriate techniques to use)
		Conducting sessions in a school context on territorial matters, conducted by staff from the local administration
		Programs designed to increase the culture of the territory and spatial planning (to be developed in partnership with the formal education system)
		More frequent use of the territory as a starting point for a set of learnings, also in the school environment (in Science, History or Geography, Chemistry or Physics, Physical Education or Visual Arts)
		Workshops with a pedagogical and consultative aspect (on a specific plan/project)
	Local governance	Strategies or municipal policies aimed at children and youth (sectoral or comprehensive)
		Youth structures in the context of urban governance (forums, councils…)
		Decision structures on local public investments (e.g. youth participatory budgeting)

	Young advisers collaborating with the planning department Focus group (composed of young people) of a continuous nature, to be consulted regularly (eg once every quarter) Allocation of resources (human and material) that facilitate the participation of young people in public consultation processes on the development of territorial management instruments Adherence to planning dynamics that specifically provide a place for children and young people (eg Local Agenda 21)
Episodes	Comprehensive urban planning exercises Planning a public space - interschool ideas competitions Consultations on specific urban projects (eg a bike path, a park, the pedestrianization of a street) Projects to be developed as extracurricular activities in a school context (in partnership with schools)

5 Conclusion

Children's participation is strongly shaped by context. This proves to be a critical factor in the children's ability to participate, playing a facilitating or inhibiting role. And the inhibiting or facilitating aspects associated with the context are usually of one of two types: political-institutional or sociocultural.

Therefore, difficulties of including young people in planning of their communities have *sociocultural* roots (the existing culture of participation, the way in which children are seen, the *disappearance* of children from the public space, or the actual planning culture itself), but also *political-institutional* ones (the nature of the processes and structures involved, the unpreparedness of different actors, the lack of resources, or too consolidated ways of working).

But despite the constraint caused by the context, some authors suggest that the participation of young people should not be seen only as a “result of what is possible”, but as a way itself to change the context. This suggestion is supported by the fact that we are working with individuals who will have the capacity to influence events for a longer time (because they will be living longer) and who, therefore, can start to be agents of change now.

This argument, related to sustainability, is precisely one of the reasons given for the participation of young people. In addition to this, others can be identified, linked to the rights of the children's, the educational impact that such practice produces (in terms of personal skills), the opportunity for the development of citizenship, or the relevance of services whose main beneficiaries are children and young people.

The strategies for the inclusion of young people in planning, because they depend on the existing context, may involve activities specifically aimed at children/youths, as well as more integrated approaches, in which they participate on an equal footing with any other citizen. And there may also be mixed-type approaches in which, throughout a planning process, specific opportunities are interspersed with general ones.

Although it seems a long way to go, the need to leave no one behind when it comes to city production or community development, demands that concrete initiatives are adopted since it is a *learning by doing* process. The local governments have a key role in leading such a process that can ensure stronger sense of community and more robust decisions. This requires a true shift towards the adoption of a number of human scale governance arrangements.

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Analysis of Temporary Pedestrian Areas: the case of Avenida Rodrigues de Freitas in the city of Porto

Manuel Caldeira, Renata Teixeira e Thales Rocha
Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal
e-mail: manuel.afonso.caldeira@gmail.com | rljt31@gmail.com | tmfr1983@gmail.com

With the confinement caused by the SARS-COV-2 pandemic, the Porto City Council started the "Rescue of Public Space" operation. Inspired by the experiences of "ciclovia" in Latin America, this experience consisted of temporarily conditioning some streets to car traffic, converting them into Temporary Pedestrian Areas (TPA) for one or two days. In these streets, the recreational use of public space was promoted through initiatives of the municipality itself, but also through the involvement of local actors – commerce, restaurants, associations, etc. Even though the local authority defends this project as a success, pointing out its reception among the population, it is understood that there is a need for a concrete analysis of the program.
Therefore, this work has as main objective to analyse the impact of these TPA, more specifically the case of Av. Rodrigues de Freitas, in the most diverse urban contexts, with special focus on the promotion of active modes of mobility. To this end, an analysis of successful case studies in other countries is carried out and their comparison with the TPA in Porto, taking into account their physical, institutional and temporal characteristics, their application methodology and their promotion among the various actors. We also used population surveys and interviews with the main actors involved in the operation - both users and program promoters -, seeking to analyse the real impact of the measure on the established environmental, urban, social and economic dimensions.

Keywords: temporary pedestrian zones; car-free zones; public space; bicycle paths.

1 Introduction

The lifestyle in a large metropolis, where the use of private cars for locomotion is predominantly used, brings several harms to the environment and people's health, such as the emission of polluting gases, formation of heat islands and excessive noise. Changing this paradigm means acting on people's quality of life - and consequently on the environment - as living in a city with good walking patterns positively affects the behaviour of its inhabitants.

Fast-developing cities are more vulnerable to the interaction between sedentary lifestyles, obesity, and chronic diseases, especially as these populations adopt a less active lifestyle and have few options to be physically active (Sarmiento, Del Castillo, Triana, Acevedo, Gonzalez and Pratt, 2017). In Madrid, 39% of hospital admissions are due to heart problems and 13% of respiratory problems are directly related to traffic intensity (Navares, Diaz, Aznarte and Linares, 2020). In parallel, there is a strong association between increased physical activity and a reduction in chronic diseases in the general population (Ding and Gebel, 2012; Poortinga, 2006; Wang, Pratt, Macera, Zheng and Heath, 2004).

The importance of modifying the relationship between the modes of transport to encourage people's mobility, enhancing the quality of life, is present in several initiatives throughout the globe. In this context are inserted the Temporary Pedestrian Areas (TPA), also known as open streets or recreational bike paths. TPAs consist of a temporary reconditioning operation of streets prioritizing pedestrians in demerit over motor vehicles, allowing them to be used for physical activities, leisure, and recreation.

According to Sarmiento et al. (2017), the rapid expansion of this type of programs - also known as Open Streets or Recreational *Ciclovia* - took place mainly in Latin American countries, where 93% of regular programs were found. The first experiences took place in the 1960s and in 1974 the initiative took hold in the city of Bogotá (Organización Panamericana de la Salud, 2009).

Among the initiatives implemented, it is highlighted that most take place on weekends and holidays, varying widely in relation to the duration, frequency, extension of the area covered, and the type of activities promoted. Bertolini (2020) makes a division between "play streets" and "ciclovia/open streets". According to the author, the former serves the specific purpose of providing playful spaces for children to play, usually during school holidays, while the latter responds to the need for recreational spaces for the general population. In recreational *ciclovia*, there is a strong focus on social balance and cohesion between different social classes, establishing links between neighbourhoods with low, medium, and high incomes - a clear trend in the case of Bogotá (Sarmiento et al, 2017; Bertolini, 2020; Zieff, Musselman, Sarmiento, Gonzalez, Aguilar-Farias, Winter and King 2018).

On the other hand, "play streets" are not as common in Latin America, with their emergence in Europe and the United States of America being highlighted (Bertolini, 2020; Meyer, 2019). In the case of Belgium, where they have existed since 1998, they consist of closing off car traffic during school holidays, agreed between local authorities and residents, in order to provide a space for children to play and contributing to the establishment of healthy living habits and combating sedentary lifestyle. Also, in the UK there is a reference to "playing out" sessions started in 2009, first in Bristol, and then expanded to other cities, promoting the closing of streets to car traffic for up to 3 hours a week (Bertolini, 2020). It is also important to bear in mind that operations such as open streets/recreational bike lanes can integrate, within themselves, components of "play streets", from the moment they contemplate activities that are clearly aimed at the physical action of children and young people (Meyer, 2019).

Regardless of the specific operation - TPA, open streets, recreational *ciclovia*, play street - all these interventions consist of what Bertolini (2020) calls *city street experiments*. In a broad way, the author defines these programs as punctual and site-specific interventions which can bring benefits to the system as a whole.

City streets experiments have become an option increasingly sought after by public policies, as they allow empirical learning rather than being tied to definitive decisions (Bertolini, 2020). The main intention of operations of this kind is to change the perception from "streets for cars" to "streets for people", influencing the modal change from car to other modes like walking, cycling and public transport means, improving people's safety and allowing the interaction of social "capital". All this while having a neutral or positive impact on local commerce (Bertolini, 2020).

However, Bertolini (2020) calls into question the assumption that these *city street experiments* can effectively contribute to changing mobility patterns in the urban environment as a whole. This is because there is a lack of studies that address the consequences of this type of programs and their transversal impact on the urban system.

One of the main problems is related to a lack of analysis and evaluation of these measures, not contributing to the construction of a body of knowledge and a redefinition of strategy. Secondly, it is yet not clear what to measure - that is, it will be necessary to increase the spectrum of indicators used to assess the consequences of these programs, not just measuring the flows or rates of motorization, but also including impacts on social well-being, economic activity, etc. Finally, there is no sense of what the main opportunities are and how to correct these operations at the systemic level.

When analysing the existing bibliography about TPA, one of the characteristics that can be drawn is that the vast majority of studies directed to temporary pedestrian zones are related to their contributions in the area of health, the promotion of physical activity and the fight against sedentary lifestyle (see D'Haese, Van Dyck, De Bourdeaudhuij, Deforche and Cardon 2015; Meyer, 2019).

All these measures are sources of inspiration, however one of the main problems is the lack of analysis and evaluation of the consequences of these types of initiatives in urban mobility in cities. It can also be said that it is necessary to make adaptations to each urban reality and listen to users and all the people affected by the adoption of the measures. Reviewing recent initiatives and following up on older ones can provide needed material for improvement

Thus, a survey of existing cases was carried out, focusing on the TPA on Av. Rodrigues de Freitas. Despite the known advantages associated with this type of initiative, it is important to quantify and qualify the benefits. To this end, this paper also seeks to assess the success of the program, regardless of its connection to urban mobility, and proposes a set of measures that will contribute to the amplification of its results.

1.1 Objectives

This article therefore brings together two distinct objectives.

On the one hand, an analysis of the TPA on Av. Rodrigues de Freitas is sought in the context of the change in mentalities already discussed. Unlike most of the literature found, in this work we tried to focus on the contribution of this type of operation in the permanent mobility patterns in the city, evaluating what Bertolini (2020) describes as a *change in mentality*.

This change in mentality would be, according to the author, motivated by a change in people's perception of the function performed – in this case – by a street in the context of the city. If a street experience takes someone out of their routine and considers both moving and staying in public space, this may introduce an occasional change in their habits and a disruption in their understanding of the public space, which would lead to the intended modal change.

The first objective of this work is to define possible indicators for the evaluation of the impact of these measures, trying to answer the following question: can the occasional conditioning of a street to car traffic, together with the local promotion of active mobility habits, promote the modal change of a city?

On the other hand, this paper seeks to assess the success of the program in account to the public reaction, regardless of its connection to urban mobility. In other words, the success of the measure will be evaluated and, in the final phase of the investigation, a set of measures that will contribute to the amplification of its results will be proposed.

2 Study Cases

Lately, the practice of healthy habits and the adoption of a more active lifestyle have been widely discussed topics, especially after the SARS-COV-2 pandemic and the need to maintain social isolation. Thinking about the reopening and the “new normal”, people started to value the practice of physical exercise outdoors and leisure in open places. TPAs are an environment conducive to the safe integration of people and physical activity practices. But this initiative is not recent. For contextualization and providing a basis for the subject, it is important to observe the existing cases, as detailed below:

2.1 Ciclovias of Bogota - Colombia

As many capitals, the city of Bogotá went through a rapid process of growth and urbanization in the 20th century. It is estimated that in the 1960s, half of the rural population moved to urban areas (Varela 1998 apud Díaz del Castillo, Sarmiento, Reis and Brownson, 2011). This change brings with it the need to formulate policies to maintain and improve the quality of life of local residents.

The first recreational *ciclovia* in Bogotá emerged in 1974 when a group of activists and university students, with the support of the transport department, promoted cycling activities on Colombian streets. However, due to the lack of an adequate organization, the event had no effect. It was only in 1982, in an attempt to return public spaces to citizens and neutralize social inequality, that Bogotá's recreational cycling program, known as *Ciclovía*, was officially inaugurated (Díaz del Castillo et al, 2011). In its development phase, *Ciclovía* had the involvement of both the community and the municipal and national government. During the consolidation process, government support for the program changed according to the agendas and priorities of different administrations, with constant changes in budget, services offered, duration and quality (Sarmiento et al, 2017).

In recent years, the program has been modernized and a new approach has been created aimed more at recreation, promoting well-being, and offering healthy leisure options. In 1996, the management of the program was transferred to the District Institute of Recreation and Sport. And in the 2000s, *Ciclovía* was already 121 km long and served 70% of administrative districts (Díaz del Castillo et al, 2011).

2.2 Open Streets in São Paulo - Brazil

The Open Streets Program aims to encourage the practice of leisure, sports, and cultural activities through the temporary or permanent dedication of stretches of public streets, squares, and squares for these activities. The opening of these streets exclusively for pedestrians increases the population's access to these activities, in addition to stimulating local commerce, giving residents a greater sense of belonging in relation to public spaces, promotes active mobility, and contributes to the reduction of automobile circulation and consequently the emission of CO^2 (LABMOB, 2019).

The mobilization for the opening of Av. Paulista to pedestrians began in 2014 by demand of civil society organizations and the population. The result of this mobilization gave rise to Paulista Aberta in 2015 in the context of the program Open Streets, decreed by the City Hall of São Paulo, the same year in which the construction of the bicycle lane on Av.Paulista. At that time, the City Hall sought to restrict the circulation of motorized vehicles and promote the opening of streets to people on Sundays and holidays. One of the landmarks of Av. Paulista being open on Sundays to the population has been the demonstration of the importance of promoting leisure through the occupation of public spaces. Currently, besides Avenida Paulista, about 300 streets in São Paulo are opened for leisure on Sundays by the Ruas de Lazer program, maintained since 1996 by the Municipal Secretariat of Sports, Leisure and Recreation (SEME), but not all of them work regularly (Costa and Sampaio, 2015).

2.3 The St. Louis experience - USA

The U.S. Centers for Disease Control (CDC), found that over 25% of adults and about 17% of American youth are considered obese, with higher rates among minority and low-income groups, indicating a worsening public health situation. In light of this, it has become critical to host initiatives to increase physical activity, which is one of the main reasons why cities have chosen Open Streets initiatives (Hipp, Eyler, Zieff and Samuelson, 2014), in addition to promoting community through social and cohesion and well-being and stimulating the neighbourhood economy. Based on this, the "Open Streets" program is an initiative implemented by the St. Louis city government, aiming to provide a space for healthy recreation, encouraging residents to be more physically active and learn about more sustainable forms of transportation, and highlight city assets (Hipp, Eyler and Kuhlberg, 2013).

2.4 Play streets of Ghent - Belgium

In the case of Ghent, the proper name is "play street" because it really has this characteristic of being more about leisure than about connection to the city. This difference is attested to by the operation's own characteristics, as the program exists exclusively during the school vacations, in July and August, and there is provision by the municipality of play equipment for children - although the operation's organizers are free to energize the streets as they see fit (D'Haese et al, 2015). Even though they are promoted by the municipality, the actions are headed by the residents, because the application for a street's participation has to be made by the residents with the consent of the majority of its inhabitants.

For a street to be eligible to become a "play street" it must also meet a number of characteristics: it must be a residential street; it must have a maximum speed limit of 50 km/h; it cannot carry a significant amount of traffic (e.g., there must be public transportation or a fire station on the street); it cannot make access to other surrounding streets impossible. There is also a limit of days for streets to become "play streets" - 14 cumulative days in total between July and August. D'Haese et. al (2015) concludes in his article that "play streets" are a good way to compensate for the lack of gardens at the children's home or the existence of parks nearby. According to Meyer, Bridges, Schmid, Hecht and Porter (2019), characteristics of the physical environment around children condition their

propensity to play sports and their sedentary habits. Play streets emerge as a solution to solve this inequality of access to play spaces for children, using existing public space for this purpose.

3 Temporary Pedestrian Areas in Av. Rodrigues de Freitas

The TPA of Porto began in June 2020, as part of a plan by the City Council to rescue the public space in the post-confinement phase, due to the spread of the Sars-CoV-2 virus. The central idea of the project is precisely to stimulate and enhance the occupation of these public spaces by the population, while promoting the current use of urban space and social distancing in the context of the pandemic. According to the Porto City Council, three pillars served as guidelines for the implementation and measurement of the project in the city of Porto: health and safety, leisure and enjoyment, and sustainability.

In the axis of health and safety, the incentive to pedestrianization of routes and soft modes of transport were highlighted as a way to promote a more active mobility, less sedentary and more compatible with the needs of social distance. In terms of leisure and fruition, the goal was to promote a better experience of entertainment and use of commercial space, making the experience of the street more pleasant and dynamic, and promoting people's stay in the urban space. Finally, sustainability was the third guideline adopted as a way to encourage the use of soft transport modes, such as walking and cycling, thus allowing a decrease in the use of motor vehicles and consequently reducing CO2 emissions.

The criteria for selecting locations for the implementation of this program took into account factors related to pedestrian habits, i.e., places that already had a strong connection with walking, thus conferring diversity and dynamism to the space. The TPA’s were applied in three zones and 14 streets, operating during the hours of 8am on Saturday to 8pm on Sunday, and had standardized demarcation. Within these three zones chosen for the operation of the TPA’s, the focus of this work is on Zone 3, more specifically on Av. Rodrigues de Freitas.

3.1 Characterization of Avenida Rodrigues de Freitas

The Av. Rodrigues de Freitas is located in the city of Porto, in Portugal, being named after the professor and politician from Porto with the same name, who lived in the 19th century. The avenue is approximately 800 meters long, extends west-east from Rua do Campinho to Largo de Soares dos Reis, and is lined with historic buildings, leafy trees, and also cultural and gastronomic venues. Some highlights are the Faculty of Fine Arts of the University of Porto, the Public Library of Porto, the Colégio de Nossa Senhora da Boa Esperança, the Jardim de São Lázaro and the Largo Soares dos Reis.

The program Temporary Pedestrian Areas of the city of Porto foresees a temporary barrier for vehicle traffic in only one stretch of Avenida Rodrigues de Freitas, the focus of our study, between Rua de Dom João IV and Rua do Duque de Saldanha (West-East direction), with a length of approximately 370 meters, as figure 1 and 2. Traffic changes are also planned as a way to relocate traffic from Avenida Rodrigues de Freitas to parallel streets.

Figure 1. Demarcation of Av. Rodrigues de Freitas (Image provided by Porto City Hall).

(a) (b)

Figure 2. In (a) Signs of the TPA spaces and (b) Legend of the TPA spaces signs (Porto City Hall).

4 Research Approach

During the pandemic of SARS-COV-2, to reduce the damage to the economy and minimize the psychological impact on people, social isolation has been slowed or hardened cyclically. The cycles of closing or reopening obey the risk band that ranks cities in relation to transmission rate. The TPA was put in place during a period of relaxation of isolation from June until December 2020.

However, outdoor activities were again discouraged due to the worsening pandemic. The interviews and survey were conducted in May 2021, even though the Rodrigues Freitas TPA was suspended. This hindrance reflected a limitation in the scope of the survey: no on-site visits to the program and

the possibility that the perceptions of the people interviewed and surveyed were influenced by the time since participation.

4.1 Research Questions

In order to understand the impact of the TPA on people's mentality and their mobility habits, we structured our work around four research questions.

The first is related to the users' perception of the program: did people like the way the TPA took place? This question tries to understand the general receptivity of the program, and it can be motivated by the most varied issues, not necessarily inherent to mobility habits.

The second work question analyses whether the TPA influenced any specific behaviour change in the people who participated in it. These habits can be related to mobility, but also to the interaction with the urban space, such as the use of local businesses, the time spent on the street and participation in joint activities.

The third question seeks to understand whether the TPA has changed the way people understand the space on Av. Rodrigues de Freitas – whether it should have more space for pedestrians, for local businesses, etc. – but also whether people have become more receptive to programs similar to TPA.

Finally, the fourth question focuses on possible changes in the weighting of mobility habits of people who benefited from the TPA program. In other words: after using the program, did users feel more willing to switch to active modes of travel?

As we can understand, the first question focuses on the general perception of the program and the second on the concrete consequences of the habits of those who used it. The third and fourth questions aim to understand the change in people's perception in relation to the two objects under study: the public space and active mobility.

The last two questions are, therefore, considered of greater relevance to understand the real impact of the TPA on people's mentality, which Bertolini (2020) appeals. However, right from the start, we were able to define some limitations of this study in answering these two questions, which involves the need for a change in mentalities to depend on two specific moments: one before and one after the change.

As this work was carried out only in a post-implementation state of the program, we could immediately foresee some limitations in understanding these responses. Even so, the study was carried out, seeking with it to contribute to establishing indicators for future monitoring of programs of this kind.

4.2 Interviews with TPA promoters: Porto City Council

A script with the main questions regarding the project was prepared and sent by email to the Directorate of Urban Mobility of the City Council, with the intention of conducting the interview and enabling the preparation of the interviewee. The interview occurred through an online platform and was granted by Architect João Pestana, the person responsible for the project.

4.3 Interviews with TPA promoters: Praça da Alegria Futebol Clube

The sports and cultural association "Praça da Alegria Futebol Clube" held activities such as table soccer and table tennis tournaments on the avenue. This second interview took place in the same formal manner as the first one. The association is located on Av. Rodrigues de Freitas itself and participated in the project invited by the company Ágora, responsible for connecting the City Council with the other stakeholders.

4.4 Surveys

Some important observations should be made regarding the population reached by the form and the interviews. Although the criteria of representativeness were not imposed as an initial premise, it will be assumed that the sample is representative, that is, that it represents with good accuracy the larger group that inhabits the locality. Another point considered in this work is that outliers will be excluded from some analyses, that is, assuming a normal distribution curve, the points outside the curve are excluded to avoid anomalies or discrepancies in the results. This is an attempt to reduce biased results, since pandemic limitations did not allow the population sample to be better.

By filling out the form, it is possible to capture a significant amount of data, but the most important thing is to gather information, that is, to organize the data in a way that conveys meaning to support the conclusions and packages of suggested measures. Especially in this work, where the sample space is small compared to other studies of this type. In other words, analysing in isolation each of the questions implemented in the survey will generate a lot of data, but what matters for issuing resolutions is the consolidation of these data in a context.

For the survey, 28 questions were formulated, which were divided into objective and subjective ones. The first block of the questionnaire corresponds to multiple choice questions, such as gender, age group, approximate location of the residence, whether the person knows the TPA program and if he/she used it on Avenida Rodrigues de Freitas. The second part has more subjective questions and were answered according to a Likert scale, from 1 to 5. This method was used to avoid mechanized answers and at the same time give neutral options to the interviewees, not having to choose extreme answer options.

The survey was developed through a form on an online platform and disseminated in three different ways: flyers with the link to access the form, which were delivered door to door in the vicinity of Av. Rodrigues de Freitas; through the dynamic email of the University of Porto and; through the social networks of Associação O Praça, one of the promoters of the program. It was possible to send responses from May 7, 2021 to May 19, 2021. Table 1 shows a summary of the profile of the people who participated in the survey.

Table 1. Summary of survey participants by gender.

Group of people	**125**	**100%**
Male	49	39%
Female	71	57%
They preferred not to say or others	5	4%

5 Results and discussion

This section is dedicated to the description of the results and analysis of this case study in different dimensions. A small "archaeological process" was carried out to retrieve the opinion of the people who enjoyed the TPA programme on Avenida Rodrigues de Freitas. Normally studies of this nature involve a larger sample space, however, due to the limitations of this work some trends will be pointed out with the crossing of the available information. It is understood that the number of 125 people is a very small sample size for this survey to serve as a basis for promoting changes in the program structure, but the crossing of information may indicate trends for further studies that will corroborate in the future. The information processed from the answered form and the interviews will be presented below.

5.1 Interviews

Through the interview with PCH, it was possible to realize that the program intends to organize more public spaces so that people can be on the streets safely in a post-confinement period and that, in addition, it is possible to form an integrated pedestrian circuit. Starting from the executive power of the City Council, the idea was, initially, to promote this kind of program concentrated in the centre of Porto.

The operationalization of the event, which started at 8am on Saturday and ended at 8pm on Sunday, took into account the isolation of the streets, traffic detour and placement of equipment, such as flower planters. Thus, identifying more commercial or residential areas that had a more pedestrian characteristic. This organization's logistics started through tests. From the interview it was perceived that the TPA's were an experiment to understand if there would be acceptance from the public and local commerce. Initially 16 different sites were identified that could host this type of event. Regarding specifically Av. Rodrigues de Freitas, the company Ágora developed a series of sporting events involving the community, that is, it was a more worked case. Av. Rodrigues de Freitas was a circuit with a higher number of events when compared to other sites that received the same type of program.

It was also verified in this interview that the incentive for the program came from the top down, that is, it was an exclusive decision by the City Hall and, then, only after there was a communication with the operators that would be involved, such as the association o Praça.

In the interview with the representatives of the "Praça", their good receptivity towards the program was highlighted. They also reported an increase in demand from people who had never heard of the association before attending the TPA. For the association, the program brought clear benefits to the territorially closest population.

However, in the interview it was also understood that there were other businesses present on the avenue, where the initiative was not so well received. By removing the possibility for people to park their cars outside the businesses, some local merchants were dissatisfied.

One issue repeatedly pointed out by the "Praça" was the short notice with which they were notified of the TPA program, which complicated the organization and preparation of the planned activities, noting an apparent opportunity for improvement in the involvement of local actors responsible for boosting the program. Also mentioned was the difficulty in adapting some of the criteria required of

the association, such as limitations in the use of equipment and the requirement of an isolation space within the "Square" establishment itself (here referring to the context of the SARS-COV-2 pandemic).

5.2 Analysis of the surveys

Among the different age groups of the attendees, there were 66 people between 16 to 30 years old (53%), 41 people between 31 to 45 years old (33%), 12 people between 46 to 60 years old (9%) and 6 people over 60 years (5%). Regarding the proximity of their residence to Avenida Rodrigues de Freitas, there were 11 people living on Avenida Rodrigues de Freitas (9%), 40 people living within 200 meters of Avenida Rodrigues de Freitas (32%), 64 people living more than 200 meters from Avenida Rodrigues de Freitas (51%) and 10 people were unable to inform (8%) (see Figure 3).

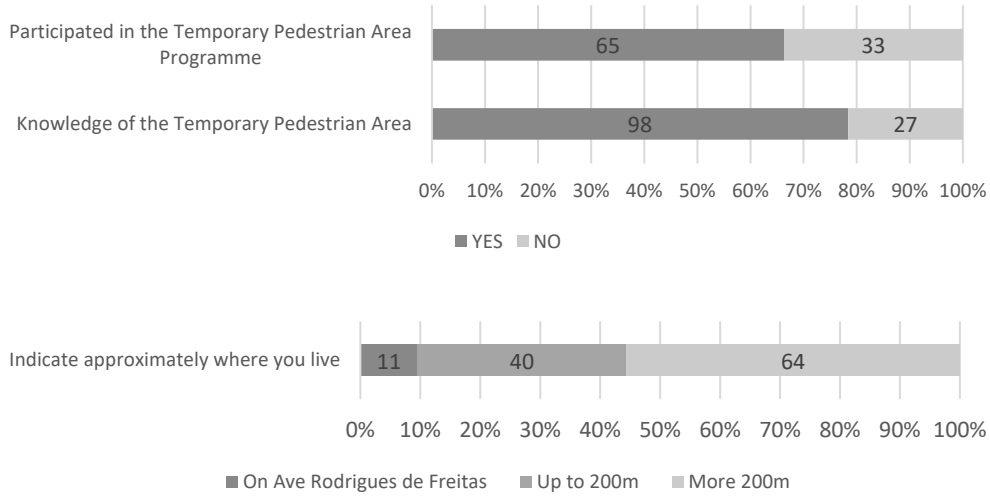

Figure 3. Description of the universe of inquiries.

Regarding knowledge of the Temporary Pedestrian Zones program promoted by the Porto City Council, 98 people reported having knowledge (78%) and 27 people were unaware of the program (22%). Among those who knew, 60 people enjoyed it on Avenida Rodrigues de Freitas (61%), 5 people in another location (5%) and 33 people never enjoyed the program (34%), despite knowing it. Once these assumptions were established, according to item 4.3 of this article, information was cross-checked in order to see if there were positive or negative changes in relation to the project, with a focus on gender, age and proximity of their residence to the TPA in Av. Rodrigues de Freitas. The graph in Figure 4 shows the answer to two different questions showing how the general perception of the TPA program was generally positive. One of the interesting conclusions to be drawn from the intersection of the two questions is that there is a percentage of people for whom the program has had a good result, even though car traffic conditioning has had a negative impact on them. In this way, we were able to understand that the population perceives the value of the operation, even though this brings certain negative externalities.

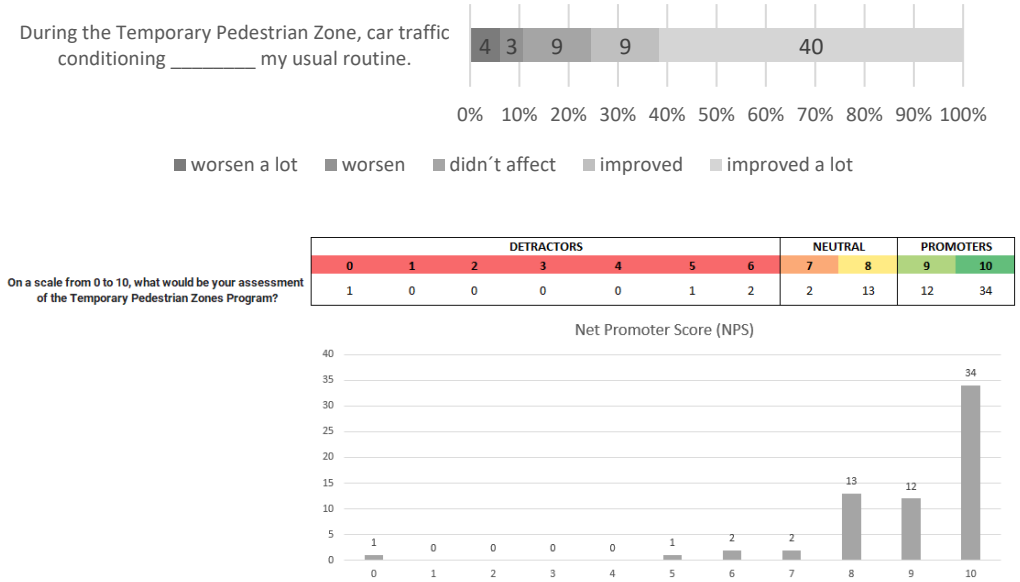

Figure 4. General perception about the programme.

5.2.1 Regarding traffic conditioning

As shown in the graphs in Figure 4, regarding the opinion on traffic conditioning, it is possible to say that 78% were satisfied. only 4 people said that the condition “crazed a lot”, and of these, only one person could not inform how far away their house is located and another one lives more than 200m away, therefore, they will be considered as discrepancies in the answer.

Two other people who fall in the age group of 46 to 60, of the female gender, thought that the traffic situation “has gotten a lot worse”. In this case, a complementary study could map what motivated this dissatisfaction. These people may have different motivations such as: difficulty in walking, some physical/motor dysfunction, or even attachment to the use of motor vehicles.

5.1.2 Indications of possible behavioural changes

Regarding walking or cycling during the TPA, considering the 56 people who used the TPA, and excluding outlier’s data, 22 people are male and 34 females. Of this portion, 77.2% of the male public moved in this way “more” or “much more”, while among women this percentage was 76.5%. Analysing the age groups in relation to the same question, we notice that this change was 77.7% in the stratum up to 30 years old and 75.8% over 31 years old.

This does not allow us to say that these people did not prefer cycling/walking before the TPA, however, the biggest change in habit took place among women and among the entire adult public in a balanced way between age groups.

Still on people considering moving on foot or by bicycle, around 70% of women who participated in the program currently consider “more” or “much more” to travel on foot or by bicycle. In relation to men, this percentage was 66.6%. Looking at the age group from 16 to 30 years old, approximately 76.6% started to make this consideration and from 31 to 60 years old, 65.7% started to think about

it. In all cases, values are much higher than 50%, which corroborates the thesis that behaviour modification was influenced as we can see in Figure 5.

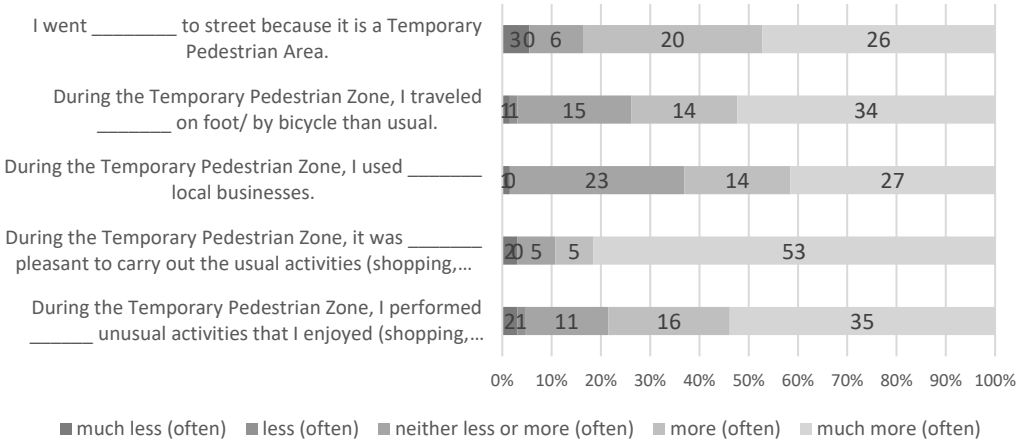

Figure 5. Occasional changes in the behaviour of the inquiries.

5.1.3 Perception of space for pedestrians

As for the perception of the need for space for the pedestrian, a gender and an age cut were made to identify those who believe that after the TPA they started to have "more" or "much more" sensitivity to this. In a total of 56 individuals (34 women and 22 men), among women, that is, approximately 94% of them started to have this perception favourable to the pawn, while among men this percentage was 81.2% (18 individuals).

In this same clipping, analysing only the age group, 92.5% of people aged 16 to 30 years began to have "more" or "much more" notion of the importance of space for the pedestrian. In the age group above 30 years, this percentage was 87.8%. There is no significant discrepancy in these percentage values, which indicates a certain homogeneity in this perception, regardless of age. What is different between genders, indicating that the TPA can have more impact on the female audience. Regardless of gender and age group, results can be seen in Figure 6 and Figure 7.

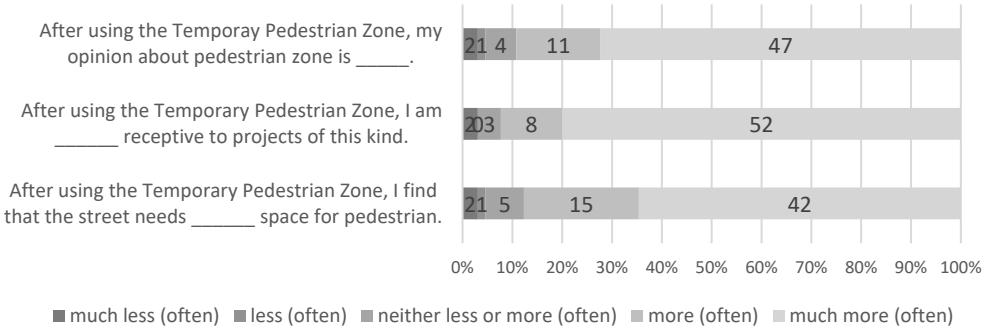

Figure 6. Change in perception about public space.

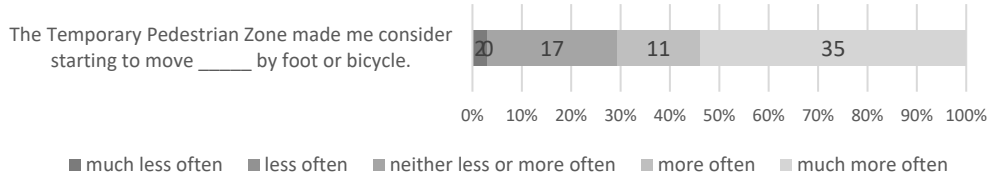

Figure 7. Change in perception about active modes of mobility.

5.1.4 Satisfaction between users and non-users

Considering only the selection of TPA users, we have that: 37 are female and 24 are male. Crossing these gender data with people's satisfaction, we found that among women 97% of users gave grade equal to or higher than 8. Among men this rate was 83%. These values may indicate that women who used the place were more satisfied than men.

This greater satisfaction in the female group may be related to the type of activities available, events promoted or types of commercial establishments in the vicinity. In a future edition of the TPA, attractions aimed at the male audience may be offered, perhaps sports or catering.

It is interesting to look at the universe of respondents who did not use the TPA. There were 60 people, but in this analysis we will stick to the gender cut-out and outlier data will be disregarded. Among the 34 women who did not use the program, 47% thought the program could make their lives “more” or “much more” pleasant. Regarding the 25 men, 13 of them thought that their life would be more pleasant, that is, 52%. If we focus on the age group, 61% of young people aged 16 to 30 believe in this improvement, while only 29% of people aged 31 and over believe in it. These numbers are low in relation to the optimism of people who know the program, indicating a possible influence of knowledge of the program in relation to changing habits.

When asked if this would improve their traffic routine on weekends, only 4 women, 11.7% responded positively and 3 men or 12% of them. In terms of age, only 19.5% of respondents believe in improvement and no one over 30 believes that they can improve. It is interesting to note that 63% of young people maintained a neutral position, as well as 37% of adults over 30. This information is very significant because inexperience in the TPA or in similar areas did not allow respondents to have a positive perception of the effects of this change. Consequently, the implementation of the TPA and the experience of participating in it, modified to some degree the experience of those involved and positive effects can be expected on urban mobility.

5.1.5 TPA dissemination and population engagement

Another aspect that deserves attention is the involvement of the population, from which we highlight that 68% of people who had some knowledge of the program actually participated in the events. It is a number that corresponds to the majority; however, it could improve substantially with more attractive communication and dissemination.

One of the issues raised referred to local trade. Of the 60 people who used the pedestrian zone, 73.5% of the women used “more” or “much more” of local businesses. Among men, this percentage was 59.1%, and 40.1% of them remained indifferent. These numbers reflect the low attractiveness of

the products sold. One way to improve the involvement of users can be strategies that attract more male consumers and at the same time encourage local entrepreneurs, especially with products aimed at pedestrians and cyclists.

6 Complementary Measures Package for Urban Mobility

As a result of this research, a package of complementary measures to the TPA program is presented, understanding that it will be necessary to amplify the results obtained by the program.

It is not the objective of this work to trace behavioural profiles of citizens. However, for the change of habits to be more comprehensive for all genders, age groups and interest groups, a greater variation in the types of activities and sports at events and, parallel to that, the promotion of entrepreneurs in the restaurant and beverage business may be fruitful.

It can also be considered to investigate the commuting habits of users coming from other locations and whether they usually go alone or with family members. If the access is by bicycle, it is possible to study the infrastructure of the bicycle lanes. If the access is by motorized vehicles, you can study the traffic reorganization to also include some parking spots within a certain radius.

Even though TPA appears to have good results and a good acceptance among the population, two main aspects are raised, which, once addressed, can amplify the success of the program. The first is the need to improve the interaction among stakeholders, that is, even though some associations and commercial establishments have played an active role in making the program more dynamic, there is still room for a more consolidated involvement of these agents. The second is the urgency to expand the dissemination of the program while increasing the involvement of the general public, to get away from the *top-down* nature of the first edition (thought by the City Council almost exclusively). In this way, three complementary measures to the program are defined, which can improve and enhance the results obtained by it.

6.1 Improved management of local stakeholders

Local stakeholder management is a vitally important measure for the success and longevity of a program like TPA. By identifying and involving all the people, groups, or organizations that can impact and energize the life of the avenue, the program will gain dimension and robustness. Thus, processes can be optimized by analysing stakeholder expectations, assessing the degree to which they affect or are affected by the project, and developing strategies for effective stakeholder engagement in support of decisions. Thus, following this process, two stakeholders were identified in our study that deserve full attention, for their ability to contribute as an excellent attraction to the TPA programme through the provision of a weekly programme of activities: the Faculty of Fine Arts and the Municipal Library of Porto.

6.2 Dissemination and communication with the population

As one of the opportunities for improvement found through the interviews, the dialogue with the public stands out. It is necessary to adopt a more comprehensive measure of advertising and communication. This measure involves actions to publicize the program on Av. Rodrigues de Freitas

in local schools, the parish council, commercial places, and associations, through posters, pamphlets, mobile stands and posters.

Another act that can be adopted here is the dynamization of the program through social networks, creating its own page of the program "Temporary Pedestrian Area - Av. Rodrigues de Freitas". This online platform can count on the sharing of weekly events related to the activities promoted on the avenue, dissemination of news and workshops related to the bicycle theme, promotion of the bicycle use with the creation of hashtags for sharing photos on the theme and among others. Marketing actions aimed at happy hour and meetings among friends can reach the public that today has little adhesion.

6.3 Urban Furniture

The third complementary measure is the need for adequate temporary urban furniture. These types of furniture are a set of elements that are installed in public spaces to fulfil a certain purpose, ideally collaborating with the coexistence between people and making life in the city more organized and comfortable. Thus, it would be an integration of temporary urban furniture, flexible and appropriate to the activities practiced, and may include playful elements to please children and attract families.

7 Conclusion

This work had two main objectives, which we will talk about here.

The first involves the answer to the question raised at the beginning of this work: will temporary experiences such as TPAs be able to contribute to the modal change of a city?

As we could see in the bibliography analysis, many studies have been carried out on programs similar to the TPA – bike paths, open streets, play streets – in different cities and contexts. However, these studies have had an incidence in the areas of health and the promotion of local commerce, and there is no work to understand the influence of these programs in changing the paradigm in the population from "roads for cars" to "streets for pedestrians" (Gehl , 2010 cited in Bertolini, 2020).

This contribution, according to Bertolini (2020), would be achieved through a change in the perception of people who participate in these experiences that would lead them to adopt different behaviours in their daily lives.

That said, it was our goal to understand the existence or not of this change. For that, we carried out the surveys that had four research questions. While the first two were focused on the general appreciation of the program - whether the population had enjoyed the program and whether it had generated specific changes in behaviour -, the other two questions focused on the change in perception - whether the opinion of people about the public space and soft manners had changed with the participation in the TPA.

Survey responses were largely positive, with encouraging results across all fields. Thus, the survey indicates that people's perception of both the need for public space and smooth mobility improved with their participation in the TPA on Av. Rodrigues de Freitas. That is, the people who participated in the program indicate that there was in them the change in mentality that was speculated in Bertolini (2020), helping this to change mentality and implement new habits.

However, some characteristics about the surveys must be safeguarded, as they can compromise the veracity of the results presented. It is believed that the following questions may have conditioned the results presented:

- Temporal inadequacy: the fact that the study was carried out months after the discontinuation of the program created not only difficulties in collecting the sample (no on-site visit was made) but also the inability to study the population before, during and after the program;
- Non-representative sample: given the difficulty of reaching the population, there is a possibility that most of the participations resulted from the dissemination of the survey by the “Praça” association, which may have conditioned the population sample to its members;
- Time of exception: the fact that the program worked during a time of confinement due to the epidemic caused by SARS-Cov-2 means that the TPA has not impacted people's habitual habits.

Taking all this into account, it will be inevitable to claim that conditions were not met to answer the question raised by Bertolini (2020) and marked as the objective of this work. However, the importance of methodological issues applied during the execution of the surveys is safeguarded, which may serve as a guide for future studies.

In order to improve the results obtained in the application of a survey about this program, the temporal adequacy of the survey among the population will have to be safeguarded above all, and it should be carried out before, during and after the program, in order to really understand the perception change in people.

The second objective of this work was to understand the success or not of the TPA as a measure in itself, regardless of its contribution to urban mobility.

In this context, the two interviews carried out were very relevant, in addition to the surveys and case studies, which gave us an understanding of two main flaws in the program:

- Lack of involvement of local actors: the program arose as an initiative of the City Council and the associations that participated in it were not consulted during the construction phase of the measure but were only called to promote the TPA. In addition, we understand the short notice with which the City Council contacted local actors and the somewhat erratic nature of the different sessions of the TPA;
- Failures in the dissemination of the initiative: it is related to little information made available to the public, causing many people not to realize the measure – something that is also clear from the surveys carried out.

Analysing the four case studies - Bogotá, São Paulo, St. Louis and Ghent - the mobilization of the general population to participate in these experiences is highlighted, not just based on the action of political decision makers. Take the case of Bogotá, where the population united to keep the cycle path in operation even when government institutions were not interested in it.

In Ghent, the mobilization of the population is one of the central points of the program. There, even though the “play street” project is defined at the level of political instances, the initiative is placed in the hands of the community, with the creation of an application system with minimum requirements for the constitution of a “play street”, as well as with the appointment of people responsible - local volunteers - for the operation. In this way, the initiative takes place on a voluntary basis by the community of inhabitants of each street.

Considering these experiences, the initiative of the TPA in the city of Porto appears out of context. The initiative came from the City Council and, from all the documents gathered with it and from the interviews carried out, nothing is removed that indicates the involvement of the general population, either in the selection or in the promotion of the intervention sites.

Although there was the involvement of local associations in the initiative, it seems to have happened downstream of the TPA implementation process, meaning that participation is not voluntary and adherence, or even integration, to this program is not as reinforced as in the cases studied.

That said, we proposed three complementary measures to the TPA, in order to expand its positive impact on the population, similar to what happens in other places. Are they:

- Management of local actors: namely of two important local institutions – the Faculty of Fine Arts and the Porto City Library – in the creation of a weekly program to boost the avenue;
- Greater dissemination among the population: through physical and technological means among the local population, in order to raise awareness and encourage participation in the programme;
- Temporary urban furniture: adaptation of urban furniture to activities carried out on the avenue, with the possible inclusion of equipment for children.

In this way, we believe that the TPA comprises a measure of great interest for the city of Porto, requiring its expansion and greater monitoring of its impact on the city's urban mobility in the long term.

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Intergovernmental cooperation as a tool for integrated regional planning? Assessing the Flemish mobility regions reform

Pieterjan Schraepen, Joris Voets, Filip De Rynck
Affiliation: Ghent University
e-mail: Pieterjan.schraepen@ugent.be

During recent decades, as a strategic response to a number of trends and developments, a wide range of organizational changes and new planning practices are being implemented to achieve better coordinated and more integrated policy outcomes. In this article, we explore the potential of the city-regional level as a platform to establish a more intense inter-governmental cooperation for addressing urban planning issues. For this purpose, we analyse a new policy frame which is currently being adopted in Flanders, leading towards the creation of 15 mobility regions on a city-regional level as an instrument for integrated regional mobility planning. By adopting a policy arrangement perspective, we scrutinize the practices and functioning that have resulted from this renewed framework so far and examine what possibilities this approach holds for achieving better coordination and alignment around broader spatial planning issues. To this end, we pay particular attention to the challenges that arise regarding the coordination with spatial planning practices within the current constellation and highlight the (conflicting) rationales that exist among the different policy actors involved to explain the latter. Our findings suggest that the advocated intergovernmental approach is promising and could function as an interesting test case for tackling urban-regional planning issues in a more integrated manner. However, in order to achieve this, the current degree of coordination between spatial and mobility planning still appears to be too weak and insufficient to achieve substantially integrated planning practices and policy outcomes.

Keywords: state rescaling, city-regional governance; intergovernmental cooperation; administrative reform

1 Problem statement

During recent decades, as a strategic response to a number of trends and developments that Western democracies are said to be facing, a wide range of organisational changes and new planning practices on various scales are being implemented, especially in the sphere of infrastructure development and environmental policy, to achieve better coordinated and more integrated policy outcomes (Da Cruz, 2019; Ahrend, 2014). Planning has been significantly affected in several ways: perspectives on the role, values and aims of planning processes have shifted; the material policy objectives and aims of planning have changed which has resulted in changes to the organization and governance of planning practice (Sager 2011). In the sphere of public transport, several authors have argued that due to the fragmented organizational landscape, it is important to study and explore how

strategic governance of public transport evolves in response to institutional reform (Paulson, 2017; Rode 2019). Efficient public transport increasingly requires successful and more intense forms of collaboration and coordination between several discrete organizations (Hrelja, Pettersson, & Westerdahl, 2016).

In this paper we take an empirical stance towards this issue and examine how coordination and new planning practices take shape within a particular state and what driving forces are involved in the latter. Therefore, we explore the potential of the (city-)regional level as a platform to establish a more intense inter-governmental cooperation for addressing planning issues.

In many countries the perspective of the city-region has led and still leads to longstanding discussions about the redesign of governmental systems (Deas 2014; Eckardt 2015; Hodson 2020). This debate is mostly focused on the discussion whether or not to establish a city – regional government structure, either based on updated forms of intermunicipal cooperation or on the creation of a supralocal government, in a variety of types related to different forms of involvement of local governments (Balducci 2003; Levelt 2013). For example, France has been relatively successful by the creation of 'communautés de ville', now called 'metropoles' for a city-regional area, typically covering the territories of one big and many small local governments (Breuillard 2016). In other countries, such as the Netherlands, the UK or Germany, similar discussions were much less successful but city – regional policies still are considered to be of the utmost importance (Metze 2011; Zimmerman 2017) . This is the case because the governance of city-regional areas is also considered part of the solution to other wicked problems, like more sustainable economic development, more intelligent mobility, a better urban quality of life, … (Suo, Shen et al 2018; Tosics 2004).

Although an important body of literature deals with planning governance and city-regional governance from a theoretical perspective, several shortcomings in the current state of literature have been pointed out, both in terms of empirical soundness and conceptual depth (Da Cruz 2019). It is observed that a lack of research empirically captures how evolutions in modes of governance can be characterised in a in a particular policy area, explaining aspects of stability and change over time, compared to studies that take more normative positions (Heggers 2020; Arnouts 2012). Krehl (2019) states that, notwithstanding exceptions, few scholarly have taken an analytical and reflective stance on how theory-building has been linked to empirical work in case study research. Assessments about territorial governance should therefore be grounded more strongly in empirical evidence. Witzel (2019) states that there is a need for further studies on how contemporary organization and management perspectives affect planning practices. Studies covering different levels of government, and additional fields of planning practice (e.g. strategic planning, municipal land-use planning) would contribute to a wider scope of insights as well as allow for comparisons (Witzel 2019, p.1430).

We try to address the mentioned shortcomings of literature by adopting a policy arrangement perspective for our analysis of a recent case of (city-)regional governance in the region of Flanders. In the Flemish context, the formation of 'new state spaces' (Brenner 2004) can be witnessed in the development of several regional governance arrangements, in which state power is planned to be channelled and re-allocated to diverse types of sub-regions in various domains such as mobility planning, but also social and health care (Voets & De Rynck 2006). Currently, a new policy frame is

being adopted in this respect, leading towards the creation of 15 mobility regions on a city-regional level as an instrument for integrated regional mobility planning.

In recent literature on policy coordination and governance, the policy arrangement approach has been put forward as a theory and formal analytical model that allows combining mechanisms of path dependency and change in the analysis of policy domains, especially in the area of environmental policy (Wiering et al. 2018; Hegger 2020). For our analysis, we build on the policy arrangement model, including elements from political science and public administration to provide an in-depth analysis of our case study. These elements include the relations with other arrangements, elements of context or the 'politics of space' (Healey 2006) like the local regime, features of the institutional relations (e.g. the intergovernmental relations between Flanders, provinces and local governments), the role of political localism and the bureaucratic tradition in Belgium and Flanders. These elements are combined together to describe and explain empirically territorial governance in Flanders within the mobility regions and leads us towards the following research questions:

How is territorial governance shaped in practice? What are the main drivers, the distinguishing characteristics and the impact of rescaling of governance in Flanders? Do new governance spaces affect deeply rooted politico-administrative practices? To what extent can policy coordination be achieved as a result? And what are the main explanatory factors of territorial governance?

2 Conceptual framework

To structure our analysis of the mobility regions as a case of territorial governance, we make use of the policy arrangement model as the main conceptual lens for our analysis (Arts & Leroy 2006). Van Tatenhove & Arts (2000) initially defined a policy arrangement as the temporary stabilisation of the content and organisation of a policy domain (p.54), building upon the assumption that institutions within a given policy domain are to a certain extent stabilised into an institutional arrangement that shows certain characteristics.

Four dimensions are distinguished to analyse the content and organization of a policy arrangement: actor coalitions, division of resources, rules of the game and discourse. The relationship between these four dimensions is strongly interrelated, as symbolised by a tetrahedron (see figure below), where a change in one of the dimensions directly affects the others. Changes in the composition of coalitions, the mobilisation of new power resources, modifications in regulation or the introduction of new policy concepts could all lead towards changes in the arrangement, setting off a chain reaction that affects all the other dimensions. An analysis of a policy arrangement should therefore concern all of the dimensions of the concept, since stability and change in the arrangement can only be fully grasped from the interaction between the structural level and the level of action (Arts & Van Tatenhove 2004).

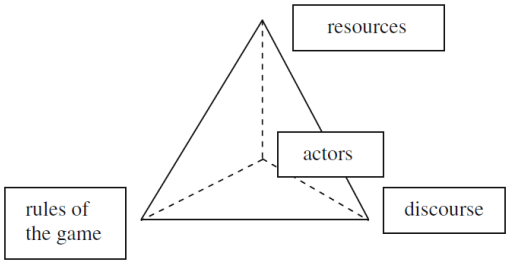

Figure 1. Dimensions of a policy arrangement (Van Tatenhove et al. 2000, p.99)

The policy arrangements approach claims to link up all the relevant dimensions of a policy, therefore enabling the study of the policy arrangement as a whole, conceptualising stability and change both in the content and the institutional organisation of a policy domain (Hegger 2020, p.5). The interplay of the four dimensions of a policy arrangement allows to describe in detail the combination of stabilising factors and change agents, helping to identify drivers of change and reasons for stability, which has proven its merits in the analysis of aspects of environmental policy, such as water policy or nature policy (Wiering 2018; Dang 2016).

In several ways the policy arrangement model bears similarities to other recent forms of governance analysis, such as the policy assemblage approach (Savage, 2020; Allen, 2007). Rather than understanding a policy as coherent thing or as definable as the sum of its constitutive components, an assemblage approach stresses that what is most important is understanding the nature of interactions between components and the capacities such components exhibit when arranged in different ways. (Savage 2020, p.322) The particular ways in which components are brought together will determine the outcome and effects of any given policy or agenda. Assemblages are the result of heterogeneous elements that are brought together into particular strategic relations and with particular desired impacts. Rather than being an assortment, a policy assemblage can be understood as an arrangement of components in particular ways with the aim of governing conduct.

The governance of regions, and its spatiality, is conceived through a looser, more negotiable, set of political arrangements that take their shape from the networks of relations that stretch across and beyond given local boundaries. The agencies, the partnerships, the political intermediaries, and the associations and connections that bring them together, increasingly form ‘regional’ spatial assemblages that are not exclusively regional, but bring together elements of central, regional, and local institutions (Allen 2007, p.6).

Mees (2018) successfully applies the policy arrangement model for the analysis of the relationships between closely related policy domains, such as water policy and spatial planning. In this paper, we build on this approach by adopting the framework to further investigate the relationship between mobility policy and spatial planning, paying attention to stabilities and evolutions in the degree of coordination and alignment that can be achieved between both policy domains.

3 Methodology

In response to the research questions cited above, we provide an analysis of the functioning and driving forces of the mobility regions as a case of rescaling and regional governance in Flanders. The case of the mobility regions reform is therefore used as a single case study (Yin 2017).

Embedded in this case is the unit of analysis that is defined as coordination mechanisms facilitating the integration of policy in city-regional areas. The main groups of analysed integration mechanisms are the governance structures, planning processes, integration instruments, and enabling conditions. The effectiveness of these integration mechanisms is considered in relation to planning and policy capacity as judged by interviewees, rather than with regard to policy outcomes. The latter would be very difficult to establish given the considerable causal complexity between institutional arrangements and policy outcomes. In addition to this, the mobility regions reform was implemented recently and some parts of the planning process are still ongoing, so the final output of the reform cannot yet be determined.

With regard to our case selection, we identify the case of the mobility regions as a critical case (i.e., a governance arrangement that is of particular relevance for a better understanding of integrated urban practice), while also taking into consideration extreme case selection. We argue our case selection with the following arguments:

First, the mobility region case concerns a reform with an area-wide demarcation for the whole of Flanders. In this respect, the reform is more far-reaching and profound than many other governance arrangements operating the sphere of mobility and spatial planning in Flanders, such as spatial strategic projects, that only operate in specific areas.

Secondly, we notice that, in contrast to other arrangements, the practice of mobility regions involves all relevant supra-local players for regional cooperation in Flanders, i.e. local governments, intermunicipal associations, provincial governments and Flemish administrations, making it a critical case for understanding territorial governance in Flanders.

Thirdly, we identify the agenda of integrated mobility planning within the mobility regions as one of the key challenges for regional planning in Flanders, given the fact that local and central governments are the key players and hold the core competences in this domain. This is to a lesser extent the case for networks in the domains of care and economy because of the neo-corporatist tradition within Belgium and Flanders (Voets & De Rynck 2008).

Regarding the adopted research method, we argue that the complexity and the explanatory nature of the research encourages the use of a qualitative research design, for which a case study design was chosen (Yin 2017). Understanding how and mobility planning and urban development are related to each other requires access to tacit knowledge not readily available in existing documents and reports. Even though some of the organizational structures of the Flemish government, their agencies and planning processes are formally documented, they do not necessarily represent the day-to-day practice of urban policymaking, planning, and implementation. For this reason, the case study research is heavily based on expert interviews with key stakeholders centrally involved in taking the key decisions related to the planning process, as well as experts who have deep knowledge of the related processes and dynamics.

Empirical data was therefore collected through interviews and document studies. More specifically, three types of data sources were used for this case study research:
Firstly, the analysis is partly based on a strong involvement as action researchers in the transformation process of the Flemish mobility department, in addition to the analysis of legislative materials, evaluation reports and policy documents. Action-research aims to deal with real-world problems and explores new ways of doing together with stakeholders through the active involvement of the researcher in a cyclical process of action and reflection (May &Lathlean 2001). We took part as experts both at local level and the Flemish level of the central departments involved in this operation and also as members of expert teams brought together to reflect and advise the Flemish government.

Secondly, we entailed semi-structured elite interviews (n = 18) with civil servants managing the mobility regions and administrative officers in other affected Flemish mobility organizations, central Flemish mobility staff and mobility experts as external observers. All selected respondents had hands-on involvement in the planning processes of the mobility regions, and the interviews focused on practical experiences of applying the legislative process in a regional negotiation setting with local governments. These interviews allowed data triangulation and complemented and refined the insights gained from the formal document analysis. For example, the interviews revealed certain discussions which were not documented in the council reports. All interviews (20 hours of recording material) were taped and transcribed verbatim (180 pages), thereby increasing the reliability of the research (Yin, 2017).
Thirdly, our preliminary analysis was also complemented by an analysis of interviews conducted by public administration students who, as part of a of a teaching assignment, conducted research in all of the 15 mobility regions and conducted interviews with civil servants and political representatives involved in the mobility region planning process (n=45).
All data was transcribed and coded using NVivo 12 Plus software. The conceptual model of the policy arrangements approach served as a heuristic lens for the coding of data.

4 Mobility regions: a tool for integrated regional planning?

We start our analysis by examining the extent to which the reform of the mobility regions leads towards substantial changes in the broader Flemish planning arrangement and provides opportunities for a more integrated regional approach to policy challenges. We do so by scrutinizing the degree of coordination that is being achieved within the planning arrangement and by examining in particular the impact of this reform on the coordination between spatial policy and mobility planning. Therefore we provide an overview of the factors fostering and hampering stability and change, using the four dimensions of the policy arrangement approach to structure our analysis and by discussing for each dimension the factors lead towards change or stability.
First, an overview is given of the important building blocks of the policy reform that constitute a rupture with the previous policy arrangement. Subsequently, we dig deeper into the factors that provide stability and continuity and may prevent a profound change.

4.1 Forces of change

4.1.1 Rules of the game

The mobility regions reform is facilitated by the introduction of a new institutional framework in which basic accessibility as a new policy approach is anchored by decree. The decree of basic accessibility stipulates the creation of 15 new mobility regions based on intermunicipal cooperation of the local governments in each of the 15 regions. The scale of the 15 regions, the cooperation and their competences are all imposed and regulated by the Flemish government itself. This is a new feature and breaks with the strong tradition of the sacrosanct 'autonomy' of the local governments and the free choice for intermunicipal cooperation, which is included in the concept of local autonomy.

Furthermore, the mobility region is based not only on a group of local governments: all the Flemish actors responsible for mobility, within the political realm of the present minister for mobility, have to take part also in the mobility region. That is another novelty compared to the historical institutional heritage: the mobility region institutionalizes also the intergovernmental cooperation between the two levels of public administration that really matter, politically: local government and Flemish government. Seen from an institutionalist perspective, this feature of the mobility regions could be described as a rupture with the institutional history of Flemish planning arrangements and the intergovernmental relations involved.

The shift from basic mobility to basic accessibility also goes hand in hand with a new geographical demarcation of mobility regions (see figure 1). The delineation process of the mobility regions was the output of an administrative cooperation between the departments of Mobility and Environment (competent for spatial planning), a new form of cooperation and an exponent of the pressure towards a more integrated approach towards policy making at the Flemish level. Based on mobility flows, functional relations and existing types of regional cooperation 19 'hypothesis regions' were delineated. Later in the process this proposal became the object of a political deliberation which resulted in a final delineation of 15 mobility regions (see map below). This political deliberation did not change the map drastically: the technical-scientific work was retained by approximately 80% in the final choices and that the political interventions were not at odds with that work.

Figure 2. Delineation of the mobility regions

4.1.2 Policy discourses

The mobility regions are being rolled out to implement a new policy approach in mobility planning, being the frame of basic accessibility, which replaces the old framework of basic mobility. The principle of basic mobility, which has been since 2001 the dominant policy frame for mobility, dictated a minimum supply of public transport for each residential area in Flanders. This is now been considered as a very inefficient and too expensive public transport system given the actual spatial structure of Flanders, dominated by a high degree of what has been labelled as 'urban sprawl' (Verbeek, Boussauw et al. 2014).

The new principle of basic accessibility, that underlies mobility region reform, propagates a new policy frame, based on the concepts of an integrated network approach of public transport designed along the idea of combi-mobility. Basic accessibility functions as part of a mobility network where combinations of different modes of transport (car, bike, bus, train) are facilitated. To achieve this layered type of transportation, a hierarchic model is established that differentiates between four types of public transportation: the train network, the core network, the complementary network, and the customized network.

A new mobility region council is established which has a dual task: on the one hand it is responsible for drawing up a short-term public transport plan and on the other for drawing up a regional mobility plan, which also includes all aspects of regional mobility. The transport region councils are chaired by a political chairman from one of the belonging municipalities and a chairman from the Department of Mobility and Public Works. The final approval of a regional mobility plan, however, is done by the Flemish Government. Within the framework of an approved regional mobility plan, the Mobility region Council then has the following tasks:

- Defining the supplementary network lines and customized transport lines and giving advice on the train network and the core network;
- Prioritize, monitor and evaluate regional mobility programs and projects of strategic importance at the level of the mobility region;
- To advise regional authorities in the preparation of the integrated investment program;
- Defining the supra-local functional bicycle route network, with the exception of bicycle highways, on which the council only gives advice;
- Monitor the interconnection of transport and infrastructure networks and facilitate combi mobility and synchromodality;
- Prioritize, monitor, and evaluate traffic safety and flow measures.

These tasks are therefore a mix of own responsibilities, giving advice to the Flemish government and tasks related to the follow-up, but always within a central framework that allows the Flemish government to overturn decisions taken by the mobility region.

4.1.3 Policy actors and coalitions

Groups of local government

The Flemish Government, through the creation of the 15 mobility regions, decided to deconcentrate delegated tasks for mobility planning and policy to 15 groups of local governments via mobility region

councils, and not to the local governments on an individual basis. So far, those tasks have not belonged to the autonomous realm of local governments. Local governments therefore are operating as a politico-administrative deconcentrated branch of the central government. The set of delegated tasks contains an advisory role, a role of co-decision with central government and a role of new responsibilities for the mobility needs of targeted groups.

We observe that many local politicians and civil servants state that thanks to their involvement in the mobility regional council the contacts between Flemish mobility actors and (groups of) local government are now much more numerous and intense than before. There seems to be a growing mutual understanding of points of interest and governance cultures, leading towards a growing mutual trust and an enhanced cooperation between the local and central level within the mobility regions.

Team MOW

The mobility regions, as a part of the evolution towards basic accessibility, do not only affect the cooperation between (groups of) local governments, but also have a profound impact on the Flemish government itself. The shift towards basic accessibility and the creation of the mobility regions lead to important organizational changes regarding the administrative reorganization, the working methods, the budgets and the reallocation of the staff in the Flemish department of mobility and public Infrastructure (MOW), the agency of roads and traffic (AWV) and the Flemish transport company (De Lijn). Those are the three important and influential Flemish actors, within the realm of competences of the Flemish minister of mobility.

The Flemish bodies that are part of the composition of the mobility region council, the department of mobility (MOW), the agency of roads and traffic (AWV), the Flemish transport company (De Lijn), unite per region in the ' team 'MOW', a new established coordination platform for Flemish mobility actors . This team can be further expanded with other Flemish operational bodies active in the mobility region. The team is chaired by a representative of the Department of MOW active in the mobility region. It is a consultative forum in which the partners involved in the MOW policy domain streamline their points of view and speak with one voice within the mobility region council from a coherent vision. On the other hand, they are responsible for information flow within their entities between the central level and the mobility region.

The Flemish public transport (buses and trams) is organized so far by 'De Lijn', which is an autonomous agency of the Flemish government. Until now, the local political pressure for better public transport services reached 'De Lijn' through party political networks and central-local relations. The creation of the mobility regions should give local governments more responsibilities and more control over the planning and organization of the regional transport network, decentralizing power from 'De Lijn' towards groups of local government in the mobility region councils. This means also that 'De Lijn' should adapt her internal organization, developing towards a more decentralized organization acting in 15 mobility regions.

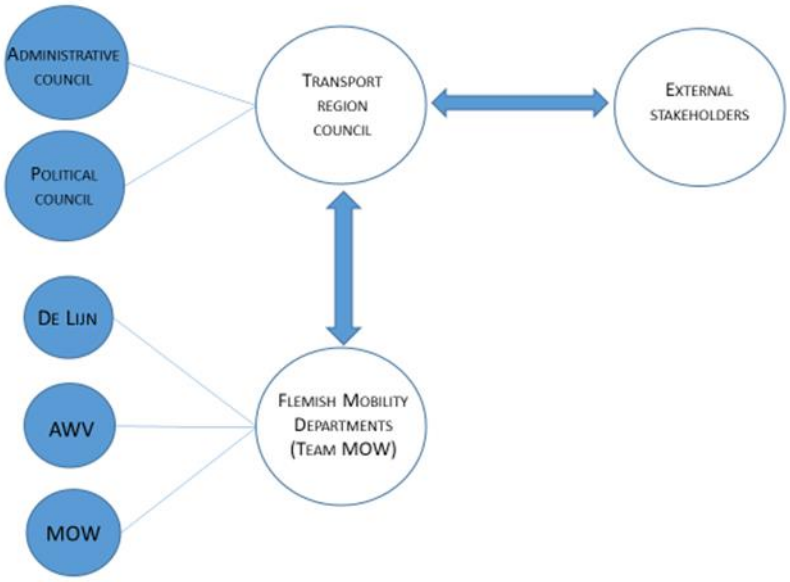

Figure 3. Governance structure of the mobility regions

4.1.4 Power and resources

Staff capacity

When we zoom in on the changes at the level of administrative capacity to support the mobility regions, we witness that the mobility region staff resulted from a reallocation of the existing staff of mobility councillors formerly operating at a provincial working scale. This existing team (about 25 staff members) within the policy department was assigned to a mobility region, either for the position of co-chair or as regional counsellor. This reorganization was carried out through a global reallocation of personnel, maintaining the existing pool of civil servants by assigning everyone to a new position. Furthermore, external consultants also play an important role in the elaboration of content and the process of the regional mobility plan and provide a strong support for the latter. The quality of this external input, as well as the extent to which tailor-made solutions for the regional area-specific challenges can be delivered, is identified as important success factor by the involved actors.

Budgetary capacity

From a budgetary point of view, the mobility region reform means that the investment programs of the different Flemish mobility entities have been merged into an integrated investment programs for the entire policy area. This integrated program replaces the separate investment programs that the various entities used to draw up and offers the possibility of looking at the investments of the policy area from the mode and network-wide viewpoint that is required for a future-oriented policy on mobility and public works. In this way, the planned investments of the various entities can be better coordinated, and synergies can be created. This should of course be done taking into account the state of the networks, based on a policy domain-wide strategy on `asset management'.

Therefore, a key innovation of the mobility region reform is that the local authorities will have a say in and control over Flemish mobility budgets. The idea is to give local authorities more say in public

transport on their territory, with a say in the supplementary public transport network and full say in the lowest transport layer, being the 'customized' transport.

4.2 Forces of stability

Despite the fact that the mobility region reform contains important aspects of change within the current Flemish planning arrangement; we also identify some aspects of stability that are more likely to be an extension of previous interactions and practices and which could act as barriers to strong change in the planning arrangement.

4.2.1 Rules of the game

The historical development of the mobility planning arrangement teaches us that the new institutional framework didn't just came out of nowhere. Practitioners involved testify that there was already a strong interaction between local administrations and the Flemish mobility actors and between the Flemish actors themselves throughout different coordination bodies like advisory boards and guidance committees, albeit not on a regional level. Also, there was already a form of objectification and coordination of the decision-making process between the administrative levels, where policy decisions were evaluated by quality control bodies and external assessment experts. The interaction between local administrations and the MOW department could therefore already be characterized as intense. We also see these characteristics reflected in the next phase of the mobility regions reform and it seems correct to conclude that this phase builds on the praxis of the preceding arrangement, retaining some of the main characteristics of the previous model. The mobility region could therefore be considered as a next generation within the policy arrangement. The most important structural change, besides the policy content concept of basic accessibility, is mainly the way in which intergovernmental collaboration now is organized on a (city-)regional scale.

The observation that the current mobility region practice in certain respects builds on the previous planning practices is also evidenced by certain difficulties from the past that still seem to be present in the current arrangement. These increased contacts between local and Flemish government take place within a central framework which is perceived as particularly stringent by local mandataries, which makes it difficult to provide sufficient tailor-made solutions and to take regional diversities sufficiently into account. The rigid setting and timing within which negotiations have to take place leads to frustration among local administrations. In this respect, there still appears to be some mistrust between central and local government, with a strong top-down mentality blamed on the Flemish government from a local perspective and a lack of knowledge about local dynamics and decision-making at municipal level. In this respect, a thorough understanding of the logic of local political decision-making appears to be of great added value to advance the decision-making process within the mobility regions but appears to be insufficiently present within the Flemish government.

4.2.2 Policy discourses

Despite the strong emphasis on coordination and cooperation in the policy discourse, we find that the effective coordination of mobility planning with the spatial planning policy remains limited in

practice, with the historically compartmentalised policy approach from the Flemish government still having a strong impact on the current functioning of the policy arrangement.

The ambition of the mobility regions to develop a more efficient mobility system is strongly interwoven with the issue of counteracting urban sprawl, making a close collaboration between the domains of mobility and urban spatial planning necessary. At an administrative level, the delineation of the mobility regions was the result of a close collaboration between the top administrators of the Department of Mobility and the Department of Environment, resulting in a mutually agreed scale as a basis for future sub regional development planning. This collaborative relationship between both domains at the administrative levels is in itself also a breakthrough in administrative traditions, but it stands in contrast with the conflictual interactions within the political sphere of government. The delineation of the mobility regions is therefore not retained as a policy scale for spatial planning, which, in the former Flemish Government, was one of the core competencies of the Christian Democratic Party that also delivered the minister responsible for spatial planning. The minister refused to integrate her own plans for 'a better integrated subregional spatial planning' in the concept and the institutional form of the mobility regions. This exemplifying pattern illustrates the way the Flemish Government works and how opposite interests try to find their way throughout the Flemish official and political constellation. This is reflected directly in the organisation and ambitions but also the ambiguity of the mobility regions. Discussing mobility planning without reference to urban sprawl and spatial planning seems to be impossible.

4.2.3 Policy actors and coalitions

(Lack of) Leadership

The extent to which planning practices within the mobility region can lead to effective change is directly linked to the dynamics that can emerge among actors in the mobility region council and the degree of involvement and the leadership that is assumed by local and central government.

We observe large differences in dynamics between the different regions, which is related to the role assumed by the political chair and the degree of leadership which is shown here. Several co-chairs testify that in their regions, the political chair himself actively takes charge of the meetings and actively seeks consensus among the members. In this case, the role of the official co-chair shifts more explicitly to the support of the political chair, who steers actively the decision-making and negotiation process himself. The fact that these consultations are drawn from a political mandatary, locally anchored in the region, has the consequence that this process is perceived by those involved as real regionally embedded cooperation with a strong local support base.

However, this political leadership does not appear to be present in all mobility regions. In some regions political leadership is not or much less at stake, which leads towards a situation where the Flemish co-chair has to take on this leading role by himself. This leads to a different type of dynamic, which also means that the mobility region in that case is perceived more as a top-down Flemish vehicle with rather little regional support. In these cases, it seems uncertain whether there will be sufficient local support to actually put the regional ambitions into practice.

Existing regional networks

Another hampering factor which might affect the impact of the mobility regions is the lack of coordination with the scale levels at which cooperation already takes place within the regions and the fragmentation that exists regarding the latter.

The extent to which the scale boundaries of mobility region correspond to existing scales of regional cooperation, where for example a strong intermunicipal cooperation is taking place, seems to facilitate and smoothen the consultation and cooperation between different regional collaborations. In the regions where these scales are strongly fragmented, this results in complex actor constellations and high transaction costs, which also has a negative impact on the effectiveness and functioning of the mobility regions.

Closely related to the latter are the regional visioning processes that already were developed in some of the existing regions before the planning processes of the mobility region initiated. Within several regions, planning processes around regional mobility were already in development, resulting in actor constellations which were already established and to which the mobility region processes had to relate in a certain way. Quite some regions seem to be experiencing difficulties in accommodating existing regional constellations in the mobility region process. Differences in actor coalitions, leadership roles and (financial) preconditions are aspects that seems to give rise to conflicts between existing regional vision practices from the bottom up with the more centrally managed mobility region planning process. Within the regions where this bottom-up regional vision creation is already maturing, regional coalitions criticize the Flemish mobility actors for wanting to keep a strong grip on the agenda and policy making in the mobility region. The latter makes it hard for existing regional actors to get involved and to insert the already existing agendas and compromises in the process. Partly this may have to do with personal relations and certainly the restrictions of the institutional framework also have a play here, but a form of centralism seems to play a role as well, making it more difficult for the Flemish government to be responsive to ‘soft space’ area images and plans that have already been discussed in the region itself, often even with the participation of actors from Flemish mobility department itself.

(Lack of) Flemish policy integration

Political-administrative tensions do not only seem to play a role between the local and central level, but also appear to play a crucial role within the Flemish government itself and the level of power and ambition that can be mobilised within the mobility regions. The degree of coordination and integration between different policy domains and administrations that can be achieved seems to be strongly linked to the latter.

We already stated that despite the initial joint official commitment in the preparation of the mobility region between the Departments of Mobility and Spatial Planning and the intense involvement and technical input of the Spatial Planning Department in the demarcation process, it was decided at the political level to not link aspects of spatial policy to the mobility region scale. In contrast to the original ambitions, the scale of the mobility region does not therefore serve as a policy scale for spatial policy programmes. Therefore, coordination with the regional development ambitions in the Flemish Spatial Policy Plan is lacking. However, some of the policy issues of the mobility regions, such as the

determination of public transportation hubs, are closely tied to aspects of the strategic vision of the Flemish Spatial Policy Plan. Whether such discussions will ultimately lead to operational decisions is still an open question, but it seems undeniable that the mobility policy developed in the mobility regions will influence spatial choices.

Despite the lack of political agreement, we notice an official cooperation between the departments of Mobility and Spatial Planning which is being established in order to cooperate more actively within the mobility region on a more operational level. A mutual platform is therefore installed to achieve better coordination between both organizations and sets up joint working groups to tackle, in an integrated manner, problems in which both policy areas interfere with each other. In this way, for a number of rather technical aspects, coordination between planning and mobility aspects is taking place, albeit rather on the side-lines and away from more politically sensitive dossiers.

When we take another step further and examine the extent to which the ambitions of integrated mobility planning and modal shift are in line with broader developments within the Flemish spatial policy and also the land-use praxis, we notice a strong lack of coordination and coherence between the policies in both domains. Until today, the actual spatial development of Flanders is still to a large extent dictated by the national zoning plans (gewestplannen) from the seventies (Vermeiren, Vervoort et al. 2018), offering a rich supply of building land and industrial areas, enabling the actual Flemish suburban sprawl (De Decker 2011). In addition to this, we notice the last two decades a strong trend towards decentralization of competences to the local level (Nadin 2018), in combination with regulatory changes which are mostly oriented towards simplifying procedures and the reduction of the turnaround time of building permits, providing also more opportunities to deviate from existing zoning plans (Coppens and Vloebergh 2017). The combination of the latter seems to amplify a (already existing) market-oriented approach to land use planning (Lind 2002), strongly oriented towards private real estate development, giving more freedom to local government for further urbanization and leading towards an increasing pressure on the (already scarce) open space left. These dynamics continue to develop in parallel with the mobility region reform and the latter does not seem to have any significant impact on these trends in the spatial domain.

Power and resources

Finally, the impact and strength of the mobility regions reform is also closely linked to the capacity that can be mobilized among the various actors involved. Here, too, we identify some points of concern that affect its functioning and may constitute an obstacle to real change.

Staff capacity

There is consensus among the involved Flemish and local actors that an active participation as a local administration in the functioning of the mobility region puts a lot of pressure on the local official capacity and competences. Great differences can be observed between local administrations in terms of the staff capacity that can be engaged in the official preparatory meetings. Especially the smaller municipalities do not have full time staff available to follow up on the mobility regions and appear to be very vulnerable in this respect, risking to drop out of the planning process in some regions. In the regions where an intermunicipal association is a member of the mobility region, we

witness a supportive role being taken towards the smaller municipalities in particular, facing the most urgent capacity problems to participate adequately in the process. In this respect, the intermunicipal associations, besides also the provincial authorities, can help to ensure that the voice of each municipality is heard sufficiently and no one is left behind.

In addition to official capacity, expertise and experience among political representatives also appears to be a factor that determines the quality of discussions and negotiations that can be held within the mobility region council. A lack of time or political experience on the part of political representatives appear to be crucial factors in the functioning of the political council. In each mobility region, there are clear differences in the degree of involvement, the expertise and the authority of the mayors and the competent aldermen respectively.

Within the Flemish mobility departments, aspects of capacity also appear to be an issue. The reorganisation of the mobility regions was carried out through a global reallocation of staff, whereby the entire existing group of civil servants was assigned to new positions, with no additional staff capacity. This leads to the fact that a lot of officials have to combine a role as co-chair and as counsellor within different mobility regions. This role combination is experienced as very tough in practice and might threaten the continuity of policy processes at peak times. There seems to be a clear lack of capacity and available staff, which is also reflected by the demand from different co-chairs to have a full-time staff available for each mobility region, which is currently lacking.

Generally speaking, the involved stakeholders asses the selection of co-chairs for the mobility region councils as successful, consisting of officials having the necessary skills to take on this role. Nevertheless, the position of co-chair requires a number of specific management competencies that were not always present in the existing group of civil servants. Within one mobility region, this lack of own suitable staff resulted in the co-chair role being taken on by an external consultant, which clearly demonstrates that existing capacity is insufficient in certain areas.

Financial capacity

The capacity that the mobility region reform can mobilise is also closely linked to the influence that can be exerted on financial budgets. Also from this angle we witness some aspects that critically question the degree of coordination achieved within the mobility regions.

We already stated that an important boundary for the policy arrangement is the choice of the Flemish government to work within the framework of budget neutrality, with fixed financial allocations for each mobility region. The financial allocation per region is based on the current operating budget of De Lijn, which means that the distribution of public transport lines within the different transport layers must be done on the basis of budgets that are provided for the current exploitation plan. There is considerable scepticism among interviewees as to whether these budgets can be sufficient to bring about a real modal shift and change in mobility behaviour, as advocated by the basic accessibility agenda of the mobility regions.

So far, the current agenda within the mobility region council has mainly concerned the specific public transport component within the regional mobility plan, with the Flemish transport company (De Lijn) in particular being the most involved Flemish partner in terms of content. As a result, the agency of roads and traffic (AWV), which controls the most important investment budgets at the Flemish level,

has so far been present at the council and participated in discussions within the mobility region council, but has not yet really come into the picture as a central actor. Currently, the AWV regional manager are not only operating within the mobility region councils, but in practice also takes on many other tasks that are running parallel to the mobility region praxis. For example, the (previously existing) one-to-one contacts with local authorities and the existing working scales of the agency do not get affected by the mobility region reform. These practices suggest that in some areas the prior decision-making processes on budget allocation still have a strong impact, an observation that has some respondents openly questioning the influence that the transportation region council will be able to exert over available budgets. Also, various Flemish officials point in this respect to numerous factors that influence the timing of investment programmes, including direct political guidance from the minister's office. Some officials state that in this respect political control is regaining its importance, where official objective prioritisation of mobility infrastructure investments plays less of a role than it used to play.

Forces of stability	Dimensions of the policy arrangement	Forces of Change
Lack of support for an integrated regional agenda: - Absence of a binding Flemish framework for spatial planning - Conflicting expectations and rationales among the involved local and Flemish actors	Policy discourses	New ideas, problem definitions and policy concepts in the basic accessibility approach: - Combi-mobility - Cost-efficiency concerns
Coordination effects: - Weak coordination with the spatial planning department - Fragmentation of existing regional networks	Policy actors and coalitions	New policy actors & coalitions: - Team MOW + Groups of local government - Local mobility region council chairs
Legislative lock-in: - Legislative impact of regional spatial plans - Perceived rigidity of the institutional framework by local actors	Rules of the game	Strong legislative impact of the decree of basic accessibility: - New geographical demarcation of 15 mobility regions - Institutionalisation of intergovernmental dialogue collaboration between Flemish gov & groups of local government
Limited financial and administrative resources: - Reallocation of the existing staff capacity - Fixed financial allocations per region ('closed envelopes') - Unclear engagement of the Flemish Road Agency, managing the main financial resources	Power and resources	New financial instruments and administrative functions: - Assignment of regional office managers to each mobility region - regional budget prioritisation via integrated investment programs

Table 1. Forces of stability and change within the policy arrangement (based on Wiering et al., 2018)

5 Conclusions

In this paper we examined the main characteristics and the impact of regional rescaling processes on planning arrangements in Flanders. We took an empirical stance towards the case of the mobility regions as a case of how regional governance is shaped in practice by examining the driving forces and the impact of this reform on local and central government. By applying the theoretical framework of the policy arrangement approach we brought into focus forces of change and stability regarding the different dimensions of the policy arrangement, being the challenges that are being put on the

regional agenda, the group of actors that is being involved, the resources being mobilised and the institutional framework (rules of the game) in which the arrangement takes concrete form.

Our analysis revealed that the reform introduces some important changes in Flemish planning arrangements, establishing for the first time a structural cooperation between groups of local authorities and Flemish actors working in a more integrated regional manner. In addition to this, new (city)-regional planning scales are being installed, besides the introduction of new coordination platforms and an increased regional allocation of administrative and budgetary capacity. It is beyond discussion that the coordination between Flemish policy actors has been strengthened and is more intensive, less formal, and more efficient than before. Also from a local perspective, the direct contacts within the mobility region are appreciated and ensure a better flow of information and a strongly intensified intergovernmental cooperation.

Despite the fact that the coordination between Flemish (mobility) actors and local governments has clearly been strengthened by the reform, we also notice that different sectoral logics still play a role within the planning arrangements. Because of this, the coordination and the interaction with spatial planning is still clearly deficient. Several of our findings regarding the lack of regional coordination within Flemish spatial planning policy and the fragile administrative and financial capacity of the transport regions indicate that a policy discourse aimed at integration and alignment does not necessarily lead to effective coordination among all relevant policy actors when implemented in practice and that coordination ambitions can still clash with features like sectoral logics, vested societal interests and political power bases..

In this respect, our findings show that for a proper understanding of the functioning of regional governance arrangements that the local-central administrative and political relationships at play throughout these arrangements and the relationships and tensions between policy actors within them are crucial aspects to be taken into account when providing a thorough assessment of policy reforms. In order to map out this interplay, the theoretical framework of the policy arrangement offers a sufficient theoretical and analytical basis for analysis, on condition that sufficient attention is paid to the behaviour of both political and administrative actors, including aspects of capacity, leadership and the relationship with other existing regional networks. Based on our analysis we state that the latter include crucial aspects in understanding the driving forces behind and outcomes of regional governance rescaling processes in Flanders .

Therefore we argue on a theoretical level that a policy arrangements approach which also pays attention to content, process and political characteristics provides an useful analytical tool to empirically capture the various dimensions of rescaling processes in greater detail. Therefore the framework allows for sufficient analytical depth and for comparisons within case study research and can thus be part of a response to the criticisms formulated regarding the latter in the literature.

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