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Fluidity of movement and pedestrian inconvenience in the shopping streets of Brussels

Fluidité des déplacements et gênes piétonnes dans les rues commerçantes de Bruxelles

Vlotheid van de verplaatsingen en obstakels voor voetgangers in de Brusselse winkelstraten

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EDITOR'S NOTE

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AUTHOR'S NOTE

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Introduction

- 1 In the face of the “cars come first” approach which has long dominated mobility policies in Brussels [Hubert, 2008] and elsewhere, a change has been taking place in recent years in order to give greater importance to more sustainable mobility. Growing congestion, environmental and health impacts and the loss of public spaces are all consequences of the socio-technical system based on cars, and are now contributing to

the development of alternative modes of transport, in combination with other factors. After decades of being ignored [Lo, 2009], walking – which is the focus of this article – is gaining more ground every day in practice and in debates [Almahmood *et al.*, 2018]. Although the available data are out of date, the BELDAM survey in 2010 revealed that walking had become the primary means of transportation for internal travel in the Brussels-Capital Region, taking over the car's place on the top step of the podium [Lebrun *et al.*, 2013]. More recently, the COVID-19 health crisis has led to heated discussions about the place given to pedestrians in public spaces. This is due to the need for social distancing, as well as the obvious lack of open spaces and their uneven distribution throughout the region, which came to light during the lockdown period. The renewed debate on the sharing of space has been accompanied by actions which redistribute (temporarily or more permanently) space for the different modes, in particular through the creation of cycle paths and pedestrianisation plans.

- 2 In addition to the current animated debates and the many different recent actions, the institutions in charge of the planning and development of the city have given more and more place to walking in their plans these past years, and have implemented a series of initiatives aimed at promoting travel on foot in Brussels [see Mezoued *et al.*, 2020; Bertrand, 2020]. It is in this context that Bruxelles Mobilité, the institution in charge of regional mobility, drew up the PAVes (Plans d'accessibilité de la voirie et de l'espace public), specifically dedicated to pedestrians. These plans define structural networks according to pedestrian traffic¹, carry out a review of the accessibility of pavements and public spaces and make a list of non-compliances. From this, recommendations and courses of action are proposed, whose priority is defined according to the frequency of use of the space in order to maximise impact.
- 3 In addition to this physical diagnosis, Bruxelles Mobilité commissioned the Centre de Recherche Sociologique (CES)² at Université Saint-Louis - Bruxelles to carry out research into the inconveniences of pedestrian travel, broadening the spectrum of inconveniences taken into account in the PAVes and integrating users' perceptions of them. The request made by Bruxelles Mobilité is therefore complementary to the PAVes: the aim is to evaluate pedestrian inconveniences through a more qualitative approach, whose purpose is to access the perceptions of users and to link them to the physical framework. This perceptible dimension is decisive on several levels. Firstly, it is necessary to take perceptions into account in order to prioritise the interventions to be carried out, so as to favour those which deal with the elements causing the biggest inconveniences. Secondly, the qualitative approach allows the inconvenience to be considered in context and thus allows its true impact to be specified, not only with regard to mobility, but also the customer catchment area, the urban atmosphere, the quality of public space, etc. Finally, it allowed us to moderate the approach used in the PAVes, which is too focused on mobility and the functionality of space.
- 4 There are two assumptions underlying the research:
 - a. Shopping streets tend to concentrate the most inconveniences due to the various devices which shopkeepers install on the pavements (terraces, stalls, advertising signs, etc.) and the traffic generated by the shops;
 - b. People with reduced mobility are the most affected by obstacles. Studying how the inconveniences affect the mobility of the most sensitive categories in particular, best highlights the inconveniences which also affect other users in a less significant way [Mathon and Saby, 2016; Thomas, 2004].

- 5 It should be noted, however, that shopping streets are not our subject of study as such, but instead they are the framework in which the research has taken place. In addition to concentrating a greater number of inconveniences, shopping areas are mostly located in the busiest streets. An analysis of spatial syntax³ carried out for the entire Brussels region [Mezoued and Letesson, 2018] shows that certain streets tend to concentrate travel flows. Logically enough, shops are preferably located in these streets for the greater visibility they offer. Therefore, the greater concentration (and diversity) of inconveniences and the higher volume of traffic make it possible to better highlight the impact of these inconveniences on pedestrian movements. Furthermore, the need to preserve the practices of merchants and shoppers requires the development of solutions which balance these needs with the need for unhindered movements. This dichotomy of needs thus avoids a one-dimensional approach to the problem.
- 6 In this article, we propose a review of the results of this research in four parts. The first part examines the accessibility of the mobility chain and its challenges. The second part presents the methodology and survey mechanisms used, calling upon several techniques and disciplines. The third part summarises the main results of the research. Finally, the fourth part proposes to explore the applicability of these measures with regard to the competences of the various stakeholders, with the main challenge being to find a balance between the various needs – fluidity of movements, proposals to slow down flows or the need for stopping places.

1. Pedestrian inconvenience at the heart of the mobility chain

- 7 People with reduced mobility are at the heart of this research. This concept covers populations of very different sizes depending on the definition used. That of the European directive 2001/85/EC which this study is based on, is intended to be very broad: “all people who have difficulty when using public transport, such as disabled people (including people with sensory and intellectual impairments, and wheelchair users), people with limb impairments, people of small stature, people with heavy luggage, elderly people, pregnant women, people with shopping trolleys, and people with children (including children seated in pushchairs)[...]”. As Mathon and Saby [2016: 8] point out, this is the same as recognising that a “person with reduced mobility is not necessarily a disabled person but a person who encounters obstacles”. This definition makes it possible to include a wider public and to replace the notion of disability with that of a disabling urban situation [Thomas, 2004].
- 8 This change in approach is significant: it places the question of the mobility chain and its accessibility at the heart of the challenges. The mobility chain refers to the ability to move without hindrance or obstacles from point A to point B and incorporates a range of factors such as the built environment, roads, development of public space and transport systems and their intermodality. This understanding of public space questions its functionality and ergonomics more than individual abilities to compensate for a disability [Mathon and Saby, 2016]. In this context, it is easy to understand that the notion of obstacle to overcome – or inconvenience as defined below – constitutes a major challenge for the public authorities in terms of urban and regional planning. With regard to accessibility, Bavoux and colleagues [2005: 12] define

it as “the possibility or ability to access, but especially the level of effort required to access. This level of effort is measured in terms of access time, monetary cost, physical and cognitive barriers and stress. All of this requires an overall investment, and accessibility is considered to be poor when the investment required to access a resource is high”. In the mobility chain, the inconvenience must therefore be considered according to objective criteria, but also subjectively, i.e. by combining tangible contextual realities and characteristics specific to the individual.

- 9 These different elements have relatively important implications. Indeed, the notion of a mobility chain implies an “efficiency of the links and interfaces between the various components (buildings, roads, transport, etc.), and places the issue of proximity at the heart of the overall mobility system. A good connection between the exit of a building, the street space and access to parking or a bus stop is the essential condition of a chain” [Mathon and Saby, 2016: 24]. This is all the more relevant when we consider, as Jacques Lévy suggests [2005; 2008], that a public transport (or any other mode of transportation) user is first and foremost a pedestrian who is taking a break [see also Lavadinho and Lévy, 2010]. Considered in this way, the inconveniences along the way for a pedestrian become obstacles in the entire mobility chain.
- 10 This notion of connection or interface between the different links in the chain is at the heart of our methodological approach, as we put forth the hypothesis that what bothers people in shopping streets is precisely related to interface deficiencies. This hypothesis is based on an observation in a Certu study (Centre d'études sur les réseaux, les transports, l'urbanisme et les constructions publiques). It concludes that “the interfaces between the built environment and the roads cause disruptions repeatedly for users, due the *segmentation of the remit and responsibilities of each*. Thus, the interface between the pavement and the shops has been clearly identified as a fundamental issue [...]” [2013: 6; emphasis added]. This interface is more than a simple material interaction between different systems: it is also the meeting point of stakeholders and their respective remits. This segmentation is exacerbated in the institutional context of Brussels, where there are many levels of authority and institutions with competence in the region.
- 11 It is therefore necessary to work on the qualitative deficiencies in terms of interface in the shopping streets of Brussels, which prevent the different spaces from being linked together with ease. It is therefore above all a question of proximity, where walking – and related assisted travel⁴ – once again plays a central role within mobility models. We are thus partly dealing with the strong current trend – which has existed for a long time (see [Jacobs, 1961]) – to rethink the urbanity [Lévy, 2005] of places (intended to be inclusive), as well as the intensity of social ties in the public space (which are often considered to guarantee the quality of the public space) [Lavadinho, 2011; Gehl, 2010].

2. Methodology for understanding pedestrian inconvenience

2.1. Selection of case studies

- 12 Although the concept of the mobility chain places a strong emphasis on intermodality and the possibility of long-distance travel, for practical reasons, the present study has been limited to short-distance pedestrian and related travel within a relatively specific

context, namely that of shopping streets⁵. Therefore, while our results may contribute to reflections on the “neighbourhood city” concept as promoted by the Plan régional de développement durable [PRDD, 2019], they do not shed light on the needs for shops to be accessible from the outskirts, which are still very present [Wayens *et al.*, 2020; Strale, 2019], nor on freight transport and logistics [Strale *et al.*, 2015; Strale and Wayens, 2013]. Moreover, they do not take into account the dynamics specific to shopping streets, which were included in the study as an example due to the high level of inconvenience generated by the presence of many shops. In addition to the fact that these streets tend to concentrate travel flows, they are frequented by social groups which are differentiated according to the types of shop located in them (diversified local commerce versus organised commerce – franchises and chains – and HORECA) [Hubert *et al.*, 2020] and influence the composition of the resident population due to the nuisances they cause [Wackermann, 1982]. Thus, the combination of shops, the spatial framework, the buildings, the social composition of users and inhabitants and mobility are all elements which interact to form the many different configurations of shopping streets, which are beyond the scope of this research. This will need to be taken into account when extrapolating our research findings to a broader scale.

- 13 The selection of shopping streets in our study was based on a preliminary selection of twenty streets which are among the densest shopping strips⁶ in the Region. These streets were each delineated in an area measuring 1 500 m x 200 m⁷ and classified according to several characteristics: the number of inconveniences (Table 1), the number of types of inconvenience, the traffic rate (from hub.brussels data), the results of an analysis of spatial syntax, the number of non-compliances with the PAVE, the morphological characteristics and the diversity of the shops. This was done in order to identify study cases which would include the widest possible range of inconveniences and spatial configurations. We chose three study cases overlapping the city centre and the immediate outskirts (the inner ring): Chaussée de Gand (with Rue Dansaert), Chaussée d'Ixelles (with Rue de Namur) and Chaussée de Waterloo (with Rue Haute and part of Chaussée d'Alsemberg) (Fig. 1).

Table 1. Summary table of pedestrian inconvenience

	Structural (fixed)					Mobile				
	Fixed installations	Street furniture	Mobility	Ground layout		Congestion	Mobile installations	Works	Shops	Mobility
Operators level 1	Concrete blocks	Fixed metal barriers	Covers	Cycling meters	Pavement morphology		Impermanent signs
	Fixed signs	Litter bins	Flower boxes	Bicycle parking racks	Malfunction/defects		Temporary parking signs
	Cabinets	Benches	Bellows	Bus shelters			Control barriers
		Stations	Fountains							
Operators level 2	Letter boxes	Newspaper dispensers	Ash collectors	Video stations	Thresholds/steps	Shop deliveries	Advertising flags	Works barriers	Terraces	Delivery vehicles
				Electric car charging stations		Works materials	Large bins	Private works	Pavements	Scooters
						Bin bags	Advertising signs	Portable toilets	Displays	Private bicycle racks
Operators level 3	Letter boxes			Thresholds/steps		Works materials	Large bins			Bicycles
						Bin bags				Cars
						Household waste				

Figure 1. Maps of the three study cases with their shopping strips: (from top to bottom) Chaussée d'Ixelles, Chaussée de Gand, Chaussée de Waterloo

14 During the first stage of the selection, we made a list of all of the inconveniences encountered along the twenty strips. They were counted and classified according to category (fixed and mobile) and level of stakeholders (operators), allowing the second selection. The classification according to level of stakeholders was based on the three levels proposed by Gabriel Dupuy in *L'urbanisme des réseaux* [1991]: the first concerns the stakeholders which implement the travel network, its infrastructure and, more broadly, the materiality of the fixed objects involved in spatial planning. In our case, these are mainly public operators. The second level stakeholders are those which

provide a service related to the use of public space. These are mainly private operators in the area of mobility such as shared bicycles or scooters, as well as shopkeepers who place a number of objects on the pavements. Finally, the third level stakeholders are the users who cause various inconveniences without contributing to the development of the space or offering a service.

2.2. Three methods of analysing pedestrian inconvenience

- 15 Three distinct methodologies were combined in order to understand how the different inconveniences and their configurations affect the journeys of users. Firstly, a *spatial and morphological analysis* was carried out to determine the physical framework of the inconveniences, the configuration of the public space (width of pavements and roads, furniture, etc.), the configuration of the ground floors and the relationship between the building and the public space. The result was a set of graphical documents which all of the other analyses were based on (fig.2).

Figure 2. Example of some of the documents produced for the morphological analysis of Chaussée d'Ixelles

- 16 Secondly, we undertook an *analysis of pedestrian flows and behaviours* according to several timelines using images taken by cameras installed at several points for each study case (fig. 3). This analysis was carried out by the Centre de Recherche Routière (CRR) in collaboration with CES. For each image location, we also carried out a morphological analysis of the buildings, including the façades, which gave us information on the size of the shops, the opening onto the public space, the access to the buildings, etc. These data provide indirect information regarding cross-traffic on pedestrian routes (see section 4.3).

Figure 3. Pedestrian routes to the Canal (top) and Rue Dansaert (bottom) (illustrative example)

Source: photos taken by Centre de Recherche Routière, study partner, on 31 March 2019.

- 17 Finally, we carried out an *analysis of the perceptions and experiences of users with reduced mobility* (visually impaired people with a cane or a guide dog, people in electric wheelchairs, parents with a child in a pram and senior citizens) through itineraries with commentary [Thibaud, 2001]. We documented each of the sixteen routes taken⁸ using cameras fixed to the interviewees, photographs taken by a third person and audio recordings of the itinerary comments, as well as notes taken by the interviewer. Interviews before and after the routes supplement this work. The latter consisted in presenting each participant with a selection of photos representing potentially bothersome spatial configurations and asking him or her to evaluate the “degree of inconvenience”⁹ of each situation (Figures 4).

Figure 4a. Situations of inconvenience assessed by participants

Source: Alexis Creten, the 01/04/2019.

Figure 4b. Situations of inconvenience assessed by participants

Source: Alexis Creten, the 01/04/2019.

Figure 4c. Situations of inconvenience assessed by participants

Source: Alexis Creten, the 01/04/2019.

Figure 4d. Situations of inconvenience assessed by participants

Source: Alexis Creten, the 25/03/2019.

Figure 4e. Situations of inconvenience assessed by participants

Source: Alexis Creten, the 25/03/2019.

Figure 4f. Situations of inconvenience assessed by participants

Source: Alexis Creten, the 21/03/2019.

3. Towards an understanding of “degrees of inconvenience”

3.1. Categorising the inconveniences and their degrees

- 18
- The first step in the spatial analysis was to repeat the survey of inconveniences in a more methodical and spatialised manner for each of the three study cases. By comparing this survey with the spatial profile of the three shopping streets, we were able to establish a correlation between the type of shop and the type of inconvenience, as well as note that certain inconveniences are independent of the type of shop and the characteristics of the study cases. These are mainly fixed obstacles related to the layout of the space (litter bins, parking and traffic signs, bollards, etc.) and cabinets (installations for water, electricity, etc., see Table 1). There are also mobile nuisances related to shops, such as advertising boards and terraces, as well as bin bags and bicycles.
- 19
- The cross-referencing of this survey of inconveniences with all of the analyses also served as a basis for estimating the “degree of inconvenience” of each of these components (Table 2) and for understanding how they interact with each other.

Table 2. Updated table of inconveniences and “degree of inconvenience” for each one

	Structural (fixed)					Mobile					People - related	Immaterial
	Fixed installations	Street furniture	Mobility	Ground layout	Congestion	Mobile installations	Works	Shops	Mobility			
Opinion level 1	Cabinet boxes	Fixed metal barriers	Bike racks	Parking meters	Pedestrian crossing	Temporary signs						Weather conditions
	Fixed signs	Litter bins	Bicycle racks	Bicycle parking racks	Micro-mobility stations	Temporary parking signs						Noise
	Cafeterias	Benches	Bike racks	Bike racks	Kiosks for shopping	Green central barriers						Lack of diversity
	Audible traffic light	Barriers	Benches	Traffic parking rules								
Opinion level 2	Litter bins	Newspaper dispensers	ATM machines	TV stations	Micro-mobility	Shop windows	Advertising signs	Work barriers	Terraces	Delivery vehicles
				Barriers of shopping routes		Work materials	Large bins	Private works	Terraces	Scaffolds
						Bin bags	Advertising signs	Mobile works	Terraces	Private bicycle racks		
Opinion level 3	Litter bins			Micro-mobility		Bin bags	Large bins		Benches	Cafes	Litter
						Bin bags					Behaviour
						Unattended spaces						

KEY

- Element which are not annoying
- Tolerated inconveniences
- Annoying/irritating elements
- Inconveniences related to visual impairments

3.2. Inconveniences observed on the routes

- 20
- Based on the interviews conducted regarding the routes, it appears that the surface layout and its flaws are the most frequently cited category, which seems to have the most impact on the movement of the respondents. Like the other elements included in the category, they are found everywhere in the space (and in the interviews), as they constitute the very infrastructure used by the pedestrian. With the exception of pavement width and weather, it is an autonomous system which interacts little with the other inconveniences.

- 21 The width of the pavements and the density of the pedestrian flow act as activators and amplifiers of inconvenience. In the vast majority of cases, obstacles on the pavement do not really constitute an inconvenience as long as the density of people is low. Similarly, travel on a wide pavement is less affected than on a narrow pavement (both in terms of perceived inconvenience and modification of route), particularly for PRM who require more space for moving about and for passing other users. These are two parameters which condition the “degree of inconvenience” caused by obstacles, to which we can add their combinatorial effect. Many of the elements examined in this study are not inconveniences when considered in isolation, but become so when combined with others. In this regard, their location with respect to the other inconveniences is of particular importance.
- 22 The camera observation of the traffic and the presence of the inconveniences throughout the day allowed us to note a similarity in their daily evolution. The peak hours are the periods when there are the most physical obstructions, as well as when various potentially problematic behaviours (e.g. parking of two-wheeled delivery vehicles) tend to be predominant. In other words, these periods combine a high density of people, less available width and a greater number of inconveniences.
- 23 Several objects also act as attractors of inconveniences. These include poles and trees, as well as certain advertising boards and street furniture which are often used as a place to attach bicycles, to leave rubbish, bin bags and scooters, or simply as a place to wait (Fig. 5). Thus, elements which are hardly bothersome have a much greater potential to become inconveniences if we take into account the elements which tend to cluster around them. Similarly, the presence of displays is linked to the presence of other inconveniences. On the one hand, they induce certain behaviours which may impede the movement of others, such as slowing down or stopping to look at a display and then turning round abruptly. On the other hand, they seem to be correlated with the presence of high obstacles, such as awnings at face height, objects, etc.

Figure 5. Litter bin acting as an attractor of other inconveniences

Source: Alexis Creten, the 29/01/2019.

3.3. Perceptions of inconveniences

- 24 While we have been able to determine the objective “degree of inconvenience” to a certain extent through spatial and morphological surveys, it is necessary to qualify it by taking into account people's perceptions. The same inconvenience is experienced differently depending on whether it is considered legitimate (such as works, terraces and displays) or illegitimate (scooters and advertising). Similarly, depending on whether the travel is functional (going to an appointment or to work) or for pleasure, certain elements are considered as obstacles or as contributing to the atmosphere of the place and to social life. This is the case for displays, terraces, the presence of other people and street furniture. Users often prefer an environment with more obstacles but with a more pleasant setting, as one of our participants expressed after her itinerary with commentary on the busy Chaussée de Gand:

“I really enjoyed it. It's a change from the everyday neighbourhoods, which are deadly boring. I don't mind seeing all of this activity. On the contrary, it's very lively. [...] It reminded me of my holidays in Italy – it's very colourful. It's really nice.”

- 25 Another variation factor in the perception of inconveniences is an individual's condition. An inconvenience for wheelchair users may not (or only slightly) affect a person without reduced mobility or a visually impaired person. This difference in impact on the route is well illustrated by the kerbs, which are an essential reference point for blind people, but an obstacle for people in wheelchairs, with a walker or a pram. In addition to these differences between categories, there are also differences within these groups of PRM, for example between a manual or electric wheelchair user,

or between a blind person with a cane or a with a guide dog. Significant variations can even occur on a more individual level: some people in wheelchairs or with walkers are able to move an obstacle out of the way, such as a bin bag or a fallen scooter, while others are unable to do so.

3.4. Cross-referencing the methods

- 26 The joint use of the three methods of analysis made it possible to cross-reference several types of information on the same subject in order to understand the phenomenon as a whole and to qualify certain findings. Although it is difficult to provide an exhaustive account of the contribution of each of the methodologies used, a concrete example will shed light on the process.
- 27 The morphological and spatial analysis shows that the number of inconveniences is greater when the built environment includes numerous openings onto the public space, particularly those involving shops. In other words, the more shop entrances there are, the greater the number of inconveniences, which tends to indicate that, proportionally, small shops generate more inconveniences than large shops.
- 28 The survey of inconveniences and above all the analysis of pedestrian flows and behaviour confirm this observation. The survey of inconveniences shows that the presence of obstructive commercial elements is related more to the number of shops than to the size of the shops. In addition, small shops are more likely to set up displays and other elements on the pavements. The camera analysis shows that the presence of these displays induces certain behaviours which hinder the movement of other users, in particular when a person blocks the way by stopping to look at the displays or when he or she suddenly turns round after looking at them. The openings onto the public space also generate incoming and outgoing flows which can impact traffic on the pavement.
- 29 However, the itineraries with commentary allow us to qualify the negative categorisation of small shops with respect to pedestrian travel. As we have seen, certain elements on the pavement are appreciated for their effect on the atmosphere and conviviality of the public space. None of our participants wanted to ban the widespread presence of displays in Chaussée de Gand. The requests concerned certain displays which encroached excessively on the pedestrian space, leading participants to ask for a reduction in their numbers (not a removal) in order to allow passage. Similarly, none of the participants were in favour of increasing the size of the shops, and some wanted to preserve or even promote small shops. Often, the most inconvenient parts of the route were actually the result of a combination of several obstacles involving various stakeholders. The criticism therefore focuses on the nature of the layout which had not been thought through, and which could have allowed for a better quality of travel had it been considered more closely beforehand, while enabling the various stakeholders to meet their needs. The optimal solution therefore does not seem to be a matter of simply clearing the public space, but rather the implementation of multiple local solutions, taking into account the various needs so as to best satisfy all of the stakeholders concerned.

4. Levers of action regarding inconveniences, beyond regulations

- 30 In addition to the analysis carried out for Bruxelles Mobilité, the CES team established recommendations so that the research results could be translated into concrete actions by the sponsor. To this end, further analysis was carried out regarding the stakeholders concerned by pedestrian inconveniences and the various possibilities for regulating them.
- 31 Contrary to a static vision of inconveniences which proves to be too rigid and therefore only allows rigid solutions to be considered, we see here a more dynamic understanding of the route and the user's relationship to the space. The fluctuation of street traffic and the presence of obstacles, the way in which these combine and interact, and the variation in people's perceptions are essential factors to be taken into account if a balance is to be achieved between the fluidity of movement and the use of public space. Without this dynamic vision, there is a risk of favouring one of these aspects to the detriment of the other by establishing regulations at regional level to address specific situations. While it is necessary to improve pedestrian mobility during peak periods by reducing the presence of obstacles and improving their layout in order to prevent the combinatorial effect, removing objects from the public space may take away from its perceptible qualities, particularly during off-peak periods. Furthermore, each element should not be dealt with in the same way, and instead its characteristics (hazardousness, impact on mobility, perceptible qualities, etc.) and indirect effects (combinatory effects and attraction of other elements) should be considered.

4.1. The stakeholders involved

- 32 The concept of the mobility chain and the focus on its accessibility allow other courses of action to emerge which are more likely to take into account the interface deficits between the various links in the chain. Two factors seem to be fundamental in developing these solutions: the type of stakeholder involved and the type of action implemented. Each stakeholder participates in its own way in the creation of inconveniences which can obstruct the pedestrian route and the mobility chains along the shopping streets (see the classification of inconveniences Table 1). Table 3 summarises the main Brussels operators concerned in our study.

Table 3. Main Brussels operators involved in the presence of inconveniences in public spaces

1st level operators	2nd level operators	3rd level operators
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The Region: <ul style="list-style-type: none"> • Bruxelles Mobilité • Bruxelles Propreté • Perspective • ... Municipalities: <ul style="list-style-type: none"> • Urban planning services • Mobility services • Public works services • ... SNCB STIB Proximus Sibelga ...	Shopkeepers Mobility operators: <ul style="list-style-type: none"> • Villo, Jump, Billy • Lime, Flash, Dott, Trotty, Cric... • Scooty, Felyx Delivery people: <ul style="list-style-type: none"> • Uber Eats, Deliveroo, Takeaway... Shop delivery people Works supervisors ...	Cyclists Residents Users
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- 33 The nature of the inconveniences, their “degree of inconvenience” and whether or not they are permanent in the public space or exist alone or in combination with others, varies from one operator to another. Therefore, in the framework of a public policy aimed at regulating the presence of pedestrian inconveniences, it seems important to us to define different modes of action and/or regulation which could be mobilised. This point is all the more important, as the rationales of the various stakeholders overlap in the public space without necessarily converging, and even contradict each other. For example, the need to attract customers through various advertising devices is in conflict with the need for pedestrian fluidity sought by mobility managers, and may also contribute to hindering the movement of certain users. It thus seems necessary to set up mediation processes between these different operators in order to facilitate the transaction regarding the inconveniences, and thus allow them to use the space according to their needs and requirements, as well as those of others. In this way, a balance could be achieved between the need for regulation linked to public action and the proper functioning of shopping streets.

4.2. Types of mediation

- 34 In order to manage as well as possible the complexity created by the overlapping of operators, situations of discomfort and their variations, the notion of mediation is decisive in defining a public policy in favour of reducing obstacles to pedestrian movements. In order to avoid confrontation and create a positive synergy between stakeholders, the inconveniences must be considered as transactional objects of urban mediation [Mezoued, 2015, 2017]. In other words, they should be objects at the centre of successive adjustments made between the stakeholders concerned in order to reach an agreement whereby the need for easy movement does not encroach on other needs, particularly commercial ones. Action regarding these objects must be adapted to the situation and allow transactions between stakeholders, so that they can make use of the action and the public policy defined. It is understood that, in the interplay of

stakeholders, the legal (objective) or perceived (subjective) legitimacy of a situation of inconvenience has an impact on mediation.

- 35 Three types of mediation/transaction can be identified in order to define the types of action to be considered:
- Legal transactions (legislative action): this is linked to the law, which is the first tool available to the public stakeholder to define its policy. The latter can lead to binding or coercive actions as well as incentives. It can impose standards for the stakeholders involved as well as provide the legal framework for a more flexible approach to negotiation and compromise;
 - Political and practical transactions (practical and/or concerted action): this is linked to the negotiation between the parties and the search for compromise;
 - Cultural and symbolic transactions (educational and informative action): this involves adjustments in individual and collective representations and in the knowledge of the objects in question (the inconveniences) and of the arrangements likely to contribute to them. Some of the possible actions in this category would be to inform and educate the different users of the space as well as the shopkeepers and the inhabitants.

4.3. Combining stakeholders and levers for action: the example of small-scale mobility

- 36 These three types of transaction may occur alone or in combination – which will often be the case – depending on the situation. The measures listed below allow an evaluation of the importance of each type of action. However, it should be noted that this is only an example of how these stakeholders and mediations can be mobilised, and is not a turnkey solution. Although it is not very transposable in practice, we believe that it has the merit of showing how the approach based on stakeholders and mediations can broaden the reflection on inconveniences.
- 37 While some are tolerated and others are not, vehicles on pavements are a fairly common source of inconvenience. Their presence is expected to increase significantly over the years, especially that of bicycles, with the number of users having doubled in just over five years, occupying a prominent place in urban planning [de Smet d'Olbecke *et al.*, 2020; Henry *et al.*, 2020]. If this trend continues, their presence on the pavements will eventually become a problem. It would be wise to be proactive and implement solutions now. Penalising offenders presents several problems: regarding bicycles, there is the risk of discouraging the practice, especially since the available parking is clearly insufficient [Brandeleer *et al.*, 2016]; regarding scooters and other self-service vehicles, anyone can move them at any time, which makes it difficult to penalise.
- 38 The problem of bicycle parking is particularly significant in shopping areas, which have the particularity of concentrating significant pedestrian flows. Consequently, “the use of street furniture for bicycles and the subsequent hindrance to pedestrian movements which is likely to result from the insufficient number of hoops” [Bastin, 2020] is a source of inconvenience which is even greater when there is a high number of pedestrians (because of the amplification of the inconvenience due to the density of people, and because of the absolute number of people concerned).
- 39 One possible solution is to create specific parking areas for soft mobility (drop off). As the regional authorities wish to reduce the number of parking spaces for cars, it might be possible to convert some of them to be used for soft mobility. In this way, it would be

possible to leave a bicycle and a scooter on the road, which would avoid adding obstacles to the pavement. In addition to this legislative aspect, a consultation with the companies in charge of renting these vehicles would allow the solution to be refined. For example, the installation of terminals (radiofrequency, beacon, bluetooth or other) in these drop-off areas would make it possible to refine geolocation and would thus prohibit leaving the vehicle on the pavement in certain narrow streets. The GPS system is not precise enough to identify the exact location of self-service scooters or bicycles, and the current solution is to ban them altogether, as the municipality of Saint-Josse has done on most of its territory.

- 40 In this particular case, the three types of mediation/transaction are involved:
- Mediation through legislative transactions in the legal definition of permitted uses for different vehicles, especially small mobility, in the traffic regulations, as well as in the definition of possibilities, for example the creation of drop-off areas in parking spaces, etc.;
 - Mediation through practical transactions by creating facilities at the most relevant places by means of negotiation with the stakeholders in place;
 - Cultural mediation through ongoing information which can be provided by mobility operators, as well as via other channels (municipal agents, mobility associations, shopkeepers, etc.).

Conclusion

- 41 Approaching the issue of inconveniences from the perspective of the mobility chain and its constraints highlights the importance of the interface between its different links. The public space is in fact characterised by the number of stakeholders which act and interact according to a different – and even opposing – rationale. The majority of obstacles are thus due to a lack of connection between the constituent elements of the chain and therefore call for solutions which go beyond the sole legislative route.
- 42 Broadening the reflection to include all of the stakeholders concerned and the many forms of mediation makes it possible to break with a static vision of urban problems. In this way, it becomes possible to develop dynamic solutions aimed at adjusting the interests of each party in order to establish a better connection between the links. Beyond the question of the ease of movement – which remains crucial in order to guarantee a quality life for all citizens – there is also the question of the desired type of public space. This question is directly related to that of social organisation at the city level. This point is clearly illustrated by the need for shopkeepers to attract shoppers, as well as by our participants' desire to keep the city vibrant and alive rather than making it an empty, sterile space which would facilitate their walking experience. Although legislation is necessary to improve the overall quality of public space and encourage (or discourage) certain practices, it must be complemented by situation-specific measures which will allow a balance to be achieved as best as possible.
- 43 While we have tried to illustrate with a few examples how this approach could be applied, the implementation of such proposals is beyond the scope of our work and depends on the public authorities and civil society. Furthermore, our results would benefit from being extended to other elements of the mobility chain, in particular the connection between modes of transport, which we were unfortunately unable to take into account due to the constraints of our research. A diversification of the study cases would also be beneficial in order to take into account areas other than shopping

streets, specific districts or even other cities with a different organisation of public space. Finally, the research could be extended to other groups with their own specificities – such as children travelling alone or people with cognitive disorders – which would make it possible to include inconveniences which have not been considered here (visual obstacles, elements which some people cannot understand, elements which hinder an understanding of space, etc.).

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NOTES

1. This pedestrian structural plan can be consulted at: [http://data-mobility.brussels/mobigis/fr/?](http://data-mobility.brussels/mobigis/fr/?x=485352.9798586729&y=6593040.226464508&zoom=12&baselayer=urbis&layers=pedestrian_network%3B&opacity=1%3B&filter=)

[x=485352.9798586729&y=6593040.226464508&zoom=12&baselayer=urbis&layers=pedestrian_network%3B&opacity=1%3B&filter=](http://data-mobility.brussels/mobigis/fr/?x=485352.9798586729&y=6593040.226464508&zoom=12&baselayer=urbis&layers=pedestrian_network%3B&opacity=1%3B&filter=)
(last accessed: 12 April 2021).

2. It has since become Centre de recherches et d'interventions sociologiques (CESIR).

3. Spatial syntax is a method of analysis originally developed at the Bartlett School of Architecture, University College London [Hanson, 1984; Hillier, 1996]. It aims to approach architectural and urban space according to their topological properties. The central idea of the method is that the position of a space within the system it is part of (a room in a building, a street segment in a road network) is the main determining factor of the space's potential to generate, accommodate and polarise movements towards and through it. For more information on the analysis of spatial syntax in BCR, see Mezoued and Letesson [2018].

4. By this we mean the forms of travel which may be understood as pedestrian travel but do not fully conform to the pedestrian category, for example, wheelchair travel.

5. The methodologies employed are detailed in the research report available at: <https://cesir.usaintlouis.be/node/175140>
 6. Shopping strips are defined by the Plan Régional d'Aménagement du Sol (PRAS) as commercial continuities which have at least twenty shops and with a spacing between shops which does not exceed three façades. Our pre-selection was based on the twenty biggest shopping streets in the inner ring in terms of number of shops and length.
 7. These areas correspond to the average length of the strips and are wide enough to include the irregularity (non-linearity) of the streets. This length also corresponds to the recommended duration of the itineraries with commentary which we have set up, lasting about twenty minutes due to the attention required of the volunteers [Thibaud, 2001].
 8. Each route was completed with a different person from each category, with the exception of Chaussée d'Ixelles, where one senior citizen was missing from the sample but two additional wheelchair users participated in the study.
 9. The degree of inconvenience is referred to as the "degree of annoyance" in the research report.
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ABSTRACTS

Travel on foot has been gaining ground in recent years in debates and in people's thinking due to growing congestion and the negative impacts of the "cars come first" approach on health, the environment and public spaces. In order to promote this form of travel in Brussels, Bruxelles Mobilité carried out a diagnosis of public spaces, through the plans for the accessibility of roads and public spaces [Plans d'accessibilité de la voirie et de l'espace public, PAVE]. The research which this article is drawn from adds to this diagnosis by identifying the broad spectrum of pedestrian inconveniences and variations in how they are perceived. To do this, several distinct methodologies were combined (spatial and morphological analysis, analysis of pedestrian flows and behaviours, itineraries with commentary with people with reduced mobility), thus making it possible to develop a dynamic vision of pedestrian movement and the inconveniences which can affect it. On this basis, several possible solutions are proposed in order to achieve a balance between the need for fluidity of movement, the slowing down of pedestrian flows and the experience of walking.

Face à la congestion croissante et les impacts négatifs sur la santé, l'environnement et les espaces publics du « tout à la voiture », la marche gagne depuis quelques années de l'importance dans les débats et les esprits. Afin de promouvoir la pratique à Bruxelles, Bruxelles Mobilité a réalisé un diagnostic des espaces publics, à travers les plans d'accessibilité de la voirie et de l'espace public [PAVE]. La recherche dont est tirée le présent article complète ce diagnostic en identifiant le spectre large des gênes au déplacement piéton et les variations de leur appréhension. Pour ce faire, plusieurs méthodologies distinctes ont été combinées (analyse spatiale et morphologique, analyse des flux et comportements piétons, parcours commentés auprès de personnes à mobilité réduite), permettant ainsi d'élaborer une vision dynamique du déplacement piéton et des gênes qui peuvent l'affecter. Sur cette base, plusieurs pistes de solution sont formulées pour arriver à un équilibre entre besoins de fluidité de déplacement, ralentissements des flux piétons et expérience de la marche.

Door de toenemende verkeerscongestie en de negatieve impact van “Koning Auto” op de gezondheid, het milieu en de openbare ruimten wordt sinds enkele jaren meer belang gehecht aan stappen in de debatten en bij de mensen zelf. Om stappen als vervoerswijze te stimuleren in Brussel, heeft Brussel Mobiliteit aan de hand van de toegankelijkheidsplannen voor de weg en de openbare ruimte (PAVE) een diagnose van de openbare ruimten opgemaakt. Het onderzoek waarop dit artikel gebaseerd is, vult deze diagnose aan door het brede spectrum van obstakels voor voetgangers te bepalen, alsook de verschillende manieren om deze obstakels te begrijpen. Door meerdere methodologieën (ruimtelijke en morfologische analyse, analyse van de voetgangersstromen en -gedragingen en becommentarieerde trajecten door personen met een beperkte mobiliteit) te combineren, kon een dynamisch beeld worden gevormd van de verplaatsingen door voetgangers en van de obstakels die deze verplaatsingen kunnen beïnvloeden. Op basis daarvan worden mogelijke oplossingen geformuleerd om tot een evenwicht te komen tussen de behoefte aan vlotte verplaatsingen, de vertragingen van de voetgangersstromen en de wandelervaring.

INDEX

Mots-clés: mobilité, espace public, qualité de vie, infrastructures urbaines

Keywords: mobility, public space, quality of life, urban infrastructures

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