

Brussels' vélomobility, more 'art' than science?

Saeys Mathis

Supervisor: Vaesen Joost

Master thesis presented in fulfilment of the requirements for the degree of
Master of Science in Urban Studies (VUB) and Master of Science in Geography,
general orientation, track 'Urban Studies' (ULB)

Date of submission: 1st June 2020

Abstract

Similar to other national and international cities, the Brussels-Capital Region has experienced a growing social and political interest for the bicycle as a valuable means of transport. Nonetheless, evidence suggests that Brussels' unique institutional structure impedes the governance of vélomobility. Unlike a traditional policy analysis, this dissertation investigates the modalities of Brussels' knowledge-power nexus. Accordingly, the following research question is addressed: "which role does knowledge (production) have in Brussels' governance of vélomobility?". To expose this question, a qualitative study of exploratory nature was conducted. Drawing on 58 mapped knowledge documents and seven expert interviews, it is suggested that Brussels has ample knowledge about vélomobility, but also that such knowledge is fragmented, heterogeneous and open-ended. Hence, this contribution concludes that Brussels' governance of vélomobility is more an 'art' than science.

Keywords: Brussels; knowledge-power nexus; multi-level governance; vélomobility.

Table of contents

1. INTRODUCTION	2
2. BRUSSELS AND THE KNOWLEDGE-POWER NEXUS: CONTEXT AND KEY CONCEPTS	5
2.1 BRUSSELS' GOVERNANCE STRUCTURE	5
2.2 THE KNOWLEDGE-POWER NEXUS	8
2.3 A TYPOLOGY OF KNOWLEDGE (PRODUCTION)	10
2.3.1 <i>Producing or transferring knowledge</i>	11
2.3.2 <i>Four knowledge patterns</i>	14
2.3.3 <i>Knowledge contributors</i>	18
3. RESEARCH DESIGN	20
3.1 MAPPING STUDY	20
3.2 EXPERT INTERVIEWS	21
3.3 DATA-ANALYSIS	22
4. ANALYSIS	23
4.1. BRUSSELS' VÉLOMOBILITY	23
4.2 THE ROLE OF KNOWLEDGE (PRODUCTION) IN BRUSSELS' VÉLOMOBILITY	26
4.2.1 <i>Brussels' knowledge sources of vélo mobility</i>	26
4.2.2 <i>More 'art' than science?</i>	30
4.2.3 <i>Brussels' knowledge contributors dictate reality</i>	35
5. SOME CONCLUSIONS ABOUT BRUSSELS' KNOWLEDGE-POWER NEXUS	39
BIBLIOGRAPHY	43
APPENDIXES	54
ANNEX 1: TYPOLOGY OF KNOWLEDGE DOCUMENTS	54
ANNEX 2: INTERVIEW GUIDE	54
ANNEX 3: TRANSCRIBED INTERVIEWS	55
ANNEX 4: QUALITATIVE CONTENT ANALYSIS	55

1. Introduction

"A city can be friendly to people or it can be friendly to cars, but it can't be both"
(Enrique Peñalosa in Montgomery, 2013: 5).

The preceding passage has undoubtedly faced resentment from differing points of view, as it nurtures a tendency towards polarisation between different transport modes.¹ However, it equally brings the discussion directly to its focal point. The quote in question encapsulates the ongoing discussion, both in academia and the political sphere, when it comes to the governance of urban transport and mobility, and how these should gestate the urban visions and solutions of the twenty-first century.

As part of this debate, this thesis departs from the Brussels Regional Mobility Plan Good Move, as it surmises that the Brussels-Capital Region (BCR)² breaks with its past in terms of its transport and mobility governance. First, we deduce from its vetting that there is growing interest in the promotion of soft modes of transport (i.e. walking and cycling) – in contrast to the prevailing, auto-centric approach (Hubert, 2008) – “in service of the quality of life and regional dynamics” (GoodMove, 2019: 9). Meanwhile, the Good Move Plan (GMP) also introduced a second shift: namely, the GMP is no longer merely the outcome of a linear administrative process, but of an allegedly “open and participative effort” involving 400 state and non-state actors (GoodMove, 2019: 12). Building on these premises, this exploratory work examines the modalities of Brussels’ governance of mobility, as evidence suggests that there are conflicting views on mobility and transport amongst the plethora of policy actors in the BCR (Ermans & Brandeleer, 2016; Genard, Berger & Vanhellemont, 2016; Koblowski & Bassens, 2018).

¹ There are, however, several sources that nuance this claim. Christophe Loir (2013; 2016), for instance, discusses in detail the transition of Brussels’ shared to disputed public spaces in the nineteenth century, which sequentially lead to the (gradual) segregation of transport modes throughout the twentieth century. More recently, however, we witness a re-equilibration among the transport modes (Lannoy, 2016; AMVB, 2018). Instructive from this is that the interactions and functions of the transport modes evolve within our cities – similarly to the ideas that foster them (cf. Demoli & Lannoy, 2019). The duality, which is presented by Enrique Peñalosa, is therefore not *a priori* a reality – which we will elucidate in the course of this work.

² Throughout this dissertation, we consider the Brussels-Capital Region and Brussels as synonyms. Whenever the ‘City of Brussels’ is mentioned, reference is made to the municipality. Furthermore, and following the third Belgium state reform (1988-1989), we behold the Brussels-Capital Region, comprised of 19 municipalities, as an autonomous Region with its own institutions, allowing self-governance for its territorial competences (such as public works, transport and local government). In section 2.1 we detail this uniqueness and how it is relevant to this contribution.

Unlike a traditional policy analysis, we give particular attention to the role of knowledge in the governance of urban transport and mobility. This approach is salient given the presence of a *knowledge-power nexus* in the scientific literature (Flyvbjerg, 1998; Belmans-Videc, Rist & Verdung, 1998; Hoppe, 2005; Dotti, 2016; Colombo, 2018); the recent revival of evidence-based policy-making (Head, 2015; Strassheim, 2017a; Van Nispen & Scholten, 2017; Parkhurst, 2017); and the limited scrutiny that has been given to how knowledge imbues governance (van Kerkhoff, 2014; Wood, 2014; Dotti, 2016; Keblowski & Bassens, 2018).

As a response, this master's thesis addresses the following research question: "which role does knowledge (production) have in Brussels' governance of *vélomobility* [see below]?". Additionally, we pose three sub-questions to elucidate the central research question: (1) "Is there any knowledge (production) in the field of *vélomobility* in Brussels? "; (2) "If so, who produces or invokes this knowledge, and what are its sources?"; and (3) "Which patterns of knowledge imbue Brussels' governance of *vélomobility*?".

Central to our research question is the term *vélomobility*; as such, it is appropriate to expose why we focus on this theme, rather than another mobility issue. In particular, we assess from several publications that cycling has been marginalised in favour of motorised transport, both in academia and policymaking, from the 1960s onwards (Koglin & Rye, 2014; Bell & Ferretti, 2015; Demoli & Lannoy, 2019). As Pucher and Buehler problematise, "[cycling was] not even considered a legitimate mode of transport, and thus excluded from most travel surveys and studies" (Pucher & Buehler, 2017: 689). Further, we assess that despite the growing body of scientific literature that exposes the benefits of cycling,³ there is no unanimity on its societal role. As Mikael Colville-Andersen explains, numerous people behold the bicycle as an instrument for leisure, as a lifestyle, a pure necessity and also as a problem (Colville-Andersen, 2018). Due to previous findings, we introduce Till Koglin's notion of *vélomobility* (Koglin, 2013). Similar to Urry's (2004) conception of *automobility*, Koglin conceptualises *vélomobility* as a holistic approach to cycling, in which it is not merely a mode of transport; rather, it deals with the power relations in governance, by acknowledging the representations, practices and materialisation of cycling (Koglin, 2013; Koglin & Rye, 2014).

³ Among other things, cycling promotes both direct and indirect benefits to the (physical and mental) health of the population (Frumkin, 2002; Oja et al., 2011; Suh, 2015); qualitatively improves land use and urban liveability (cf. Kenworthy & Laube, 1999; Henderson, 2006; Banister, 2008; Kingham & Tranter, 2015); and addresses individual mobility barriers related to gender, equality and diversity (Bielak, 2015; Colville-Andersen, 2018).

The aim of this dissertation is to contribute to a broader theoretical and societal debate. The thesis, therefore, seeks, on the one hand, to investigate the modalities of the knowledge-power nexus in the BCR, and, on the other hand, to introduce a comprehensive conception for bicycle governance in Brussels, by focussing on vélomobility.

To this end, we opted for a qualitative method of exploratory nature, consisting of two methodological steps. The first step consisted of a "mapping study" (Cooper, 2016: 76), resulting in the identification of 58 knowledge documents related to Brussels' vélomobility. In the second methodological step, seven expert interviews were conducted with local *knowledge contributors* (see below). Subsequently, a "qualitative content analysis" (Bryman, 2012: 557) was performed for both the mapped knowledge documents and the fully transcribed expert interviews.

This master thesis is structured as follows. In section 2 we first expose Brussels' unique governance structure and secondly elaborate on the relevance of the knowledge-power nexus, after which we introduce a new typology of knowledge production that helps contextualise the presented nexus. Section 3 details the methodology and qualifies the steps taken for the analysis. Subsequently, section 4 presents the central thesis of this contribution, namely that Brussels has ample knowledge about vélomobility, but that it is fragmented, heterogeneous and open-ended. At last, we summarise and conclude this work with a reflection on the limitations of the present dissertation, as well as three recommendations for further research.

2. Brussels and the knowledge-power nexus: context and key concepts

The Good Move Mobility Plan (GMP) serves as the starting point of this work. Unlike a traditional policy analysis, this thesis attempts to gain insight into the role of knowledge (production) and how it imbues the governance of vélomobility in the Brussels-Capital Region. To expose the latter, we first inquire Brussels' intricate governance structure and mirror the Good Move Mobility Plan to it. Subsequently, we elaborate on the relevance of the knowledge-power nexus, and finally we introduce a new typology of knowledge production to expose the modalities of this nexus.

2.1 Brussels' governance structure

"Brussels: an institutional jumble ..." (Corijn & Vermeulen, 2012: 339, Authors' translation, original in Dutch).

The choice of *governance* in the research question, as opposed to *politics* or *policy*, is not arbitrary. The available literature on (urban) governance, including Pierre (1999), Jouve (2005), Brenner (2009), Bevir (2012), Fukuyama (2013) and Jessop (2016), extensively discusses how the transition from *government* to *governance* re-arranged the organisational processes of the state. The existing conceptions of governance, and how these imbue the structures and processes of the political system, are, however, influenced by the (theoretical) approaches of the authors (cf. Davies & Imbroscio, 2008; Bevir, 2012). Although we do not want to negate this finding, it is not our purpose to unravel the different theoretical strands of governance in this work. Still, it is imperative to develop the concept of governance for our further argumentation. We define *governance*, based upon the aforementioned publication, as a dynamic process, consisting of state and non-state actors, within a multi-layered (political) system, in which the respective actors' advocate, collaborate and compete for *power*.

Following this working definition, we endorse three inter-related elements, which make the Brussels-Capital Region a salient case.

First, we note from Vaesen (2008) that Brussels' institutional structure is best approached from the notion of *multi-level governance*. From this point of view, the author implies that Brussels' governance structure is characterised by a unique *horizontal* and *vertical* layout (see also Van Wynsberghe, 2013; Vandermotten, 2014). Whereas the former refers to the governance processes at the same institutional scale, the latter discusses a hierarchical organisation between higher and lower-level entities, e.g. the region and the municipalities (Hondeghe et al., 2013).

Inevitably, such a constellation is challenging in several manners when it concerns a transversal theme such as vélomobility. As Hubert et al. (2013) argue: "mobility, of course, does not stop at the regional administrative boundaries" (p.12). Summarily, the BCR finds itself in a predicament in which it not only has to deal with its intra-regional mobility issues (see below), but also has to reconcile mobility issues that extend beyond its territorial and administrative boundaries. Consider, for instance, the ongoing debate about the company cars in Brussels (May, Ermans & Hooftman, 2019)⁴ or the realisation of the inter-regional bicycle network (Brussels Mobility, n.d.).⁵ Although measures have been taken to address some mobility-related challenges (cf. Van Wynsberghe, 2013), these appear to be in vain. As hinted above, not only do the governance-related mobility challenges not restrict themselves to inter-regional structures, but they also impede intra-regional issues (Lebrun et al., 2012; Lagasse, 2012). Accordingly, Hubert et al. (2013) report that "coordination [...] must also exist within Brussels, as the points of view of BCR and certain municipalities are sometimes so different when developments must be carried out" (p14). Based on the preceding, we assert that a horizontal and vertical institutional overlap characterises Brussels' governance of vélomobility. For the analysis, we thus recognise Brussels' intra-regional governance structure, but equally acknowledge its inter-regional interdependence.

⁴ One of Brussels main mobility challenges is the growing traffic congestion, which is mainly due to the daily influx of car commuters (Hubert et al., 2013; Strale, 2019). Summarily, May, Ermans & Hooftman's (2019) synopsis describes the not insignificant share of company cars in this respect, as well as their contribution to Brussels' environmental, economic and mobility issues.

⁵ The 'RER vélo', in French, or 'FietsGEN', in Dutch, is an inter-regional bicycle network that connects the BCR to its hinterland (Timenco, 2012). Although the project was initiated in 2010, Ermans and Brandeleer (2016) address the absence of a structural budget and agency for the realisation of the bicycle network.

Second, the re-arrangement of state power introduces various state and non-state actors, from multiple-institutional scales to the structuring of public issues within a particular policy subsystem (Howlett, Ramesh & Perl, 2009; Jessop, 2016).⁶ Although not all policy actors are equally involved in governance, as we will highlight in section 2.3.3, their aggregation leads to a “process of muddling through” (Lindblom, 1959). Moreover, Van Haute et al. (2018) point out that Brussels’ unique governance structure, with its multitude of actors, is fragmented, although this fragmentation is (partly) compensated, on the one hand, by the cumulation of political mandates, which create interdependencies in Brussels multi-level governance (Vaesen, 2008), and, on the other hand, by the role of technical bodies as a “patient power” (Zitouni & Tellier, 2013: 15).⁷ The institutionalised fragmentation not only concerns the ability to partake in the governance process, but equally hampers the distribution of resources, the exchange of information, and the implementation of policy-objectives (Vaesen, 2008; Lagasse, 2012; O’Connor and Vaesen, 2018; Vaesen & Wayens, 2018).

Pro-rata, the Regional Mobility Plan Good Move resonates to Brussels' specific multi-level structure. As a redress to this fragmented hierarchy, the GMP discerns from the Regions traditional governance approach. Particularly, and as addressed in the introduction, the plan is no longer merely the outcome of a linear administrative process, but of a collective effort that incorporated 400 state and non-state actors that was preceded by an international benchmark of six comparable cities. The contribution of these policy actors is at the heart of our inquiry: Good Move’s ambition was to transcend individual interests, through an “open and participatory process” (GoodMove, 2019: 12), in order to address Brussels mobility-related challenges.

⁶ A policy-subsystem should be understood as an aggregation of different actors, institutions and ideas within a specific policy area (McCool, 1998).

⁷ Zitouni and Tellier extensively elaborate on how the administration takes a proactive, yet concealed, stance in the development of Brussels transport agenda. Instead of pursuing grand visions, these bodies act as a patient power that prepare the city for its future, by mobilising (technical) expertise, introducing procedural measures and pursuing political consensus as a mediator (Zitouni & Tellier, 2013).

Good Move's ambition, however, brings us to the third and final element, which concerns the dynamics between the policy actors themselves and how these structure the governance process. The previous two elements already hinted that Brussels' governance structure consists of a plethora of policy actors, each with their particular position, resources and interests (cf. Vaesen, 2008). Correspondingly, we assume that the involved actors advocate, collaborate and compete for *power*. In the context of this master's thesis, we specifically expand on Vaesen's notion that knowledge is an integral part of power and the exercise of power (Vaesen, 2008). In section 2.2, we, therefore, address this notion by examining the knowledge-power nexus.

2.2 The knowledge-power nexus

“Power, quite simply, produces that knowledge and rationality which is conducive to the reality it wants” (Flyvbjerg, 1998: 36).

Building on section 2.1, we can justify that (urban) governance embodies a dynamic interplay between different policy actors. Intrinsic to this interaction is how power is exercised to steer governance. How this occurs is, however, subject to both contextual and individual factors (Bemelmans-Vidéc et al., 1998; Howlett, Ramesh & Perl, 2009; Caramani, 2014). The conceptions of power and power processes have been a subject of inquiry for many scholars (Brown & McLean, 2018). Hence, we can only familiarise ourselves with the conception of power and how it imbues governance in the following paragraphs.

Instructive to this thesis is that power is a multi-layered concept that resonates throughout several dimensions of governance (cf. Etzioni, 1975; Lukes, 2005). As a part of this debate, Arts and Van Tatenhoven (2004) suggest in their literature review that power, regardless of its conceptions and idioms, can be structured along three interconnected elements: relational (e.g. negotiations, affiliations), dispositional (e.g. financial assets, knowledge, military means) and structural (e.g. the rule of law). In this way, power thus acts both as a dominator and as a capacity to governance (Béland, 2010; Béland & Cox, 2016), especially if we consider power as “the organisational and discursive capacity of agencies, either in competition with one another or jointly, to achieve outcomes in social practices, a capacity which is however co-determined by the structural power of those social institutions in which these agencies are embedded” (Arts & Van Tatenhoven, 2004: 347).

The preceding argumentation, however, says nothing about the dispositional resources available to the policy actors to exercise their power. To this end, a wide range of means, known as *policy instruments*, are available to the policy actors to exercise their power. The variety and form of these instruments are abundant, and scholars like Christopher Hood (1983) and Bemelmans-Videc et al. (1998) have accordingly organised several of these policy instruments into taxonomies. There are, of course, other categories besides the NATO-model and the three faces of power which we do not consider in the scope of this work.⁸ Salient for our case is how the taxonomies mentioned above concede the (normative) role of 'knowledge' within governance, alongside the formal (e.g. regulations) and informal (e.g. financial (dis)incentives) policy instruments. Although in practice these instruments are mainly used in synergy (Bemelmans-Videc et al., 1998; Flyvbjerg, 1998), it is increasingly relevant to inquire the role of knowledge in governance, given the renaissance of evidence-based policy-making (Head, 2015; Strassheim, 2017a; Van Nispen & Scholten, 2017; Parkhurst, 2017).

Parallely, but also as a result of this revival, a body of literature has rationalised that the boundaries between knowledge and power have blurred (Radaelli, 1995; Hoppe, 1999; Strassheim, 2015; Vigar, 2017). This belief, accordingly, contests the standing assumption that the use of knowledge is both rational and linear, as suggested by Wildavsky's idea of "speaking truth to power" (Wildavsky, 1979). In the Wildavskian approach, 'expert' knowledge is provided to the policy actors in order to solve a public issue in a 'neutral' manner (Hoppe, 1999; Strassheim, 2015; Dotti, 2016). Nevertheless, knowledge often proves subordinated to the political requirements and the prevailing paradigm of the policy-subsystem (Howlett, Ramesh & Perl, 2009). Moreover, Hoppe (2005) and Dotti (2016) assessed that policy actors carefully choose and apply knowledge, in order to strengthen their legitimacy vis-à-vis competitors. The previous notion is equally shared by Strassheim (2017a) and Colombo (2018), who hint that the use of knowledge is neither linear, nor predictable. Instead, they imply that knowledge has a non-neutral nature that intends to underpin political power. Correspondingly, Bent Flyvbjerg, in his seminal work *Rationality and Power – Democracy in Practice*, concludes that "power determines what counts as knowledge [...] [and] procures the knowledge which supports its purpose, while it ignores or suppresses that knowledge which does not serve it" (Flyvbjerg, 1998: 226). Hence, we assert that knowledge utilisation structures a knowledge-power nexus, in which the instrumental use of knowledge cannot be dissociated from the other means of power.

⁸ Howlett, Ramesh and Perl (2009) provide an overview of the existing policy instruments.

Evidence, equally, suggests that the knowledge-power nexus imbues Brussels vélomobility governance. Summarily, Keblowski and Bassens (2018) inquiry reveals that Brussels' contemporary transport and mobility policies are organised around a hegemonic 'neoclassical-sustainable' paradigm which obfuscates several of Brussels' key transport and mobility issues. In other words, their synopsis exposes that the invoked and produced knowledge on transport and mobility, by Brussels' policy actors, resonates with the political agenda (Keblowski & Bassens, 2018: 426). Most likely, the same applies for the GMP and Brussels vélomobility more in general. Based on the preceding, this thesis scrutinises the characteristics of Brussels' knowledge-power nexus.

2.3 A typology of knowledge (production)

"Power is more concerned with defining reality than dealing with what reality really is"
(Flyvbjerg, 1998: 66).

Notably, the emergence of the aforementioned knowledge-power nexus does not elucidate the question about which types of knowledge are involved, nor by whom they are produced and how these are imbued in Brussels' governance. However, we can assess from the literature that the role of knowledge production in governance is versatile (cf. Howlett, 2009; Béland & Cox, 2016; Kuehnhanss, 2018).

Depending on the policy goals, policy actors will rely on a plurality of information that seems relevant to them (Bardach, 2012). For instance, policy actors will use knowledge in an attempt to sermon a particular aspiration. From this point of view, knowledge thus acts as an instrument to 'inform' society about the existence, meaning and effects of a problem, as well as the possible solution(s) to it (Bemelmans-Videc et al., 1998; Kuehnhanss, 2018). Tenably, the use of knowledge does not limit itself to the transfer of information, with the purpose of exhortation. From Christopher Hood's NATO-model, we learn that knowledge can serve as an *ad hoc* tool to structure a public issue in accordance with a particular agenda (see also Radaelli, 1995). Moreover, policy actors invoke or produce knowledge, in the form of audits, benchmarks, inquiries, strategic notes and (scientific) research, to support or oppose a particular notion (Hood, 2007; Howlett, Ramesh & Perl, 2009; Kuehnhanss, 2018).

In an attempt to make sense of this plurality we introduce a new typology of knowledge. In this endeavour, Alessandro Colombo's notion of *policy-oriented research* serves as a structuring component, which the author defines as “the process of providing (producing/transferring) new, usable, and action-oriented knowledge about fundamental collective/social problems, containing options for solutions (and their consequences) for users who have to different degrees the power to take decisions affecting the public arena” (Colombo; 2018: 15).

From Colombo's extract, we deduct three general dimensions that allow us to study the role of knowledge (production) in governance. The first dimension refers to the process of provision, and hence to the *sources* of the knowledge. Central to this dimension is whether the knowledge is produced internally or transferred from an external constituent. The second dimension alludes to the different patterns of knowledge that structure the form of knowledge (production). As for the scope of this dimension, the notion of “more art than science” and its circulation is being questioned (Bardach, 2012: xvi). The third, and final, dimension refers to the position of the knowledge contributors within the policy-subsystem. Through this dimension, we qualify that not all policy actors are equally involved in governance.

2.3.1 Producing or transferring knowledge

Although there is a growing number of studies that investigate the circulation of knowledge in policy subsystems, this literature often omits the modalities by which knowledge is produced or transferred (Wood, 2014; van Kerkhoff, 2014; Keblowski & Bassens, 2018). To expose this, we elaborate in the first dimension on the sources of knowledge. Concretely, we highlight multiple characteristics of internally produced knowledge and transferred knowledge.

From the literature, we learn that internally produced knowledge is structural to governance (Bardach, 2012), in large part because of the ease of access to place-based information and the physical proximity of policy actors (Parkhurst, 2017). Notwithstanding that Dotti (2016) nuances the eminence of local knowledge, since it is often a scarce resource within city-regions. Vaesen and Wayens (2018) affirm Dotti's notion by suggesting that the produced knowledge is not necessarily 'for' or 'by' local actors. Correspondingly, they find that only limited (consolidated) knowledge is produced on Brussels issues. This is despite Brussels' high share of *knowledge contributors* (see below) (Kalenga-Mpala & Wautelet, 2018),⁹ as well as its role as an (inter)national knowledge hub (Dotti et al., 2014; Vaesen & Wayens, 2014).¹⁰ An important implication of this absence is that the policy actors lack ramified knowledge on context-specific issues, which can result in the forging and adhering to hegemonic knowledge (cf. Koblowski & Bassens, 2018).

Meanwhile, since the turn of the 21st century, various studies have revealed that local policy actors engage in *circuits of knowledge* (Featherstone & Venn, 2006; McCann, 2008; Healey, 2013), i.e. "epistemic communities who transfer, emplace, and utilise certain forms of knowledge as part of their practice" (McCann, 2011:15). Often, the objective of this engagement is to draw lessons from innovative ideas, visions, and practices which have been produced elsewhere in the hope of achieving similar policy outcomes (Stone, 1999). In this regard, the literature suggests that the utilisation of external knowledge has proven to be increasingly vital in the framing of local challenges (McCann & Ward, 2010; Wood, 2014).

Introducing external knowledge within governance is, however, not as linear as previous arguments imply. Evidence, namely, suggests that the transferability and utilisation of external knowledge is equivocal.

⁹ In their focus report, Kalenga-Mpala and Wautelet (2018) elaborate on the employment status of Brussels' knowledge-based economy. Herein they find that Brussels exceeds both the Belgian and European averages of employment rate in research and development. Their inquiry revealed that, in 2015, 48% of those employed in this sector work at a higher education institution. Additionally, 13 % and 38 % are, respectively, employed in public and private services.

¹⁰ Brussels' role as an (inter)national knowledge hub manifests itself, on the one hand, as "the capital of European research geography" (Dotti et al., 2014: 9); and, on the other hand, as Belgium's epicentre of higher education institutions (Vaesen & Wayens, 2014).

Concerning the former, Dolowitz and Marsh (2000) rightly question the degree to which knowledge is transferable across different political settings. While externally produced solutions to place-based challenges may foster policy-change, there is no guarantee that their implementation will bring about the expected outcomes. As Vigar (2017) observes, policy actors are often insufficiently aware of the contextual factors that perpetuate best-practices and the applicability of them in their situation (see also Dolowitz and Marsh, 2012; Stead & Pojani, 2018). Hence, he suggests that “[policy actors] should learn from, rather than transfer; adapt but not seek to emulate, the experience of others” (Vigar, 2017: 42).

Additionally, we should consider Astrid Wood’s remark that “[it is] rarely just about transferring knowledge” (Wood, 2014: 1241). Several publications also substantiate this notion. For instance, Robinson (2006) and McCann and Ward (2010) elucidate that by adopting transfer practices as such, alternative visions of the future are excluded *a priori* from the policy discussion. Evidently, the same applies for locally produced knowledge, but as Dotti (2018) declares: “external knowledge is commonly used to substantiate predefined preferences and to legitimise the position of a political actor against opponents” (Dotti, 2018: 132).

In this way, we can thus assert that external knowledge is structural to the knowledge-power nexus, as it is instrumentally used by policy actors to underpin their policy goals (Stone, 1999; Wood, 2014; Stead & Pojani, 2018). Frankly, the latter does not imply that there is a local knowledge deficit in governance. However, evidence equally suggests that Brussels’ particular governance structure impedes how knowledge is produced or invoked (Vaesen & Wayens, 2018). Previous assessments are salient for the continuation of this work. Notably, we learn from the preceding arguments that the sources of knowledge are not only diffused along ideas, visions and practices, but also institutional structures. In the analysis we therefore give ample attention to the plethora of knowledge sources.

2.3.2 Four knowledge patterns

The second dimension explores the *knowledge patterns* that structure the knowledge-power nexus. We assess that the utilisation of knowledge, as a means of power, is ample (cf. Hoppe, 2005; Dotti, 2016). Yet, the interpretation of what knowledge actually is seems ambiguous (Hoppe, 1999).

It is needless to say that governance requires *reliable* knowledge (cf. Strassheim, 2017a; Strassheim, 2017b). However, as we already revealed in section 2.2, knowledge often serves both as a means and recipient of power, causing it to have a diverging role in governance (Hoppe, 2005). Within this context, it is, therefore, appropriate to expose Colombo's (2018) dichotomy of *fundamental* and *policy-oriented* knowledge (see Table 1 for an overview),¹¹ especially since both forms are often blurred in practice (cf. Etzioni, 2008; Bardach, 2012). Arguably, policy actors seldom generate '*fundamental*' knowledge for governance, as their policy goals require "*derivative rather than original*" knowledge (Bardach, 2012: 82). In particular, we assess that policy actors pre-eminently collect, invoke, synthesise and interpret malleable information, which seems relevant to their policy-objectives (Bardach, 2012; Colombo, 2018). Correspondingly, *policy-oriented* knowledge differs from *fundamental* knowledge, since the former is a "distilled practice" that serves governance (2008: 834), while fundamental knowledge is devoted to understanding and inquiring the 'truth' of real-world issues through primary research (Weimer & Vining, 2015; Colombo, 2018).

¹¹ Summarily, Colombo (2018) distinguishes in his work *fundamental* and *policy-oriented* research as separate from each other. In the scope of this contribution, we opted to replace Colombo's term *research* with *knowledge* for uniformity.

Fundamental knowledge	Policy-oriented knowledge
Understanding	Changing
True	Decisions
Interests	Need
Robust	Relevant
Primary	Secondary
Collecting	Interpreting
Analytical slices	Major facts
Public	Confidential
Ready	Needed
Published	Readable
Communication	Communication!
Useful	Usable

Table 1: Antithesis between fundamental and policy-oriented knowledge. Source: Colombo (2018: 22).

Evidently, we consider Colombo's dichotomy as a valuable heuristic to identify *fundamental* and *policy-oriented* knowledge in governance, rather than an explanatory tool for inquiring the role of both knowledge forms in governance separately. Regarding the latter, we instead draw upon four knowledge patterns, which are structured according to their 'primacy' and 'circulation' in governance (Hoppe, 2005; Dotti, 2016). The first presupposes their conformity to "more art than science" (Bardach, 2008: xvi), with which we inquire whether the policy actors give primacy to *politics* or *science* (Hoppe, 2005). The second variable deals with whether the invoked or produced knowledge is either *diffused* or *concentrated* in the governance structure (Dotti, 2016). In Figure 1, we illustrate the four knowledge patterns that we identified from the academic literature. Each of these patterns is subsequently clarified.

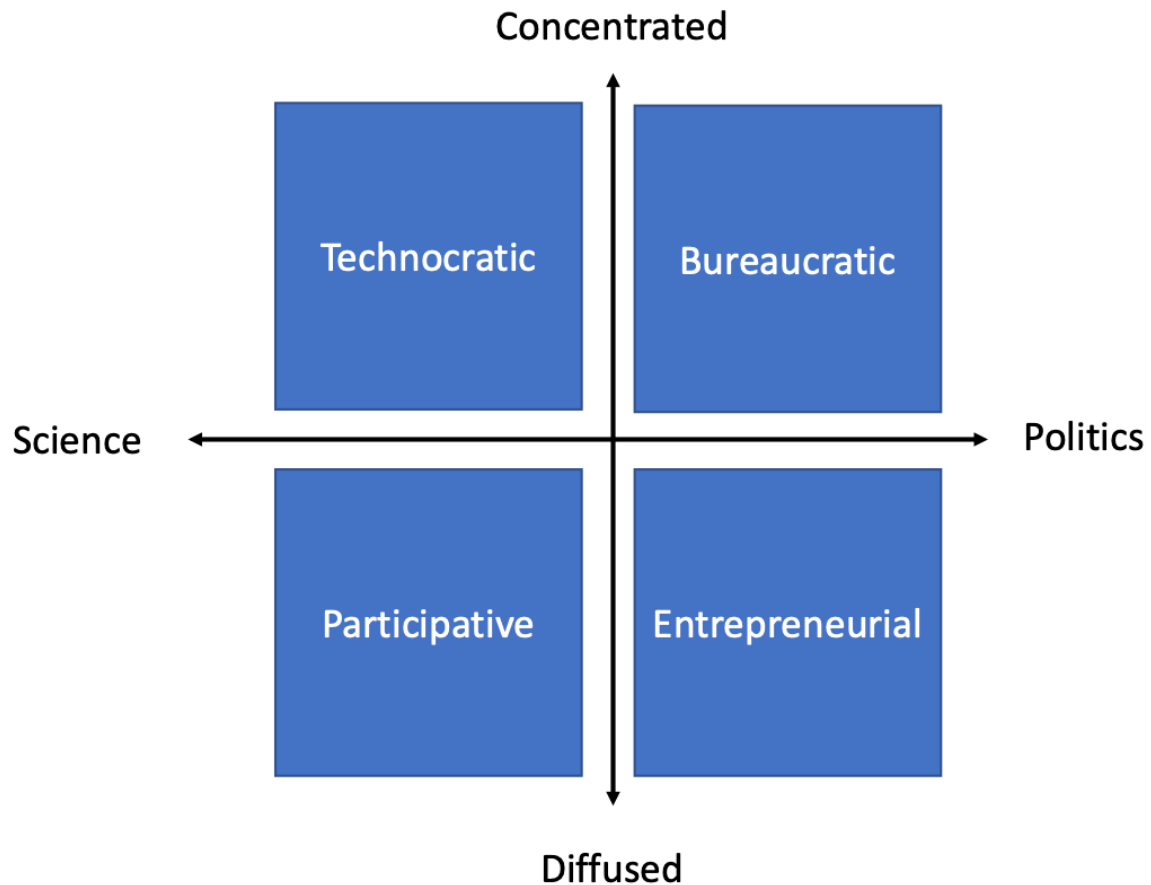


Figure 1: Four knowledge patterns. Source: Own composition on the basis of Hoppe (2005) and Dotti (2016).

The **bureaucratic pattern** cannot be disassociated from its Weberian interpretation. As is well known, the Weberian conception of bureaucracy rationalises that the administration is at the “service of political power” (Hoppe, 2005: 209). Characteristic of this political-administrative axis is the presupposed rationality and neutrality of these services (Weber, 1964). Moreover, it is generally assumed that administrations embrace knowledge that derives from a hierarchical process, in which relevant expertise is invoked, to perpetuate political consensus (Hoppe, 2005; Hondeghe et al., 2013).

Opposite to the bureaucratic approach, the **technocratic pattern** invokes or produces evidence-based knowledge, independent of the policy-objectives, as a response to public issues (Gilley, 2017). Analogous to this, the leitmotiv of the technocratic pattern is that “good policy is spoiled by politics”, as Hoppe (2005:209) argued. Hence, the technocratic tendency gives primacy to technical solutions (over political ones) that are characterised by systemic, validated and scientific knowledge, which is produced by experts or professionals (Hoppe, 2005; Gilley, 2017).

Meanwhile, the **participative pattern** involves an effort to engage citizens from outside the governance processes, thus mobilising diffused knowledge (Dotti, 2016). Although this participatory turn in governance has received growing attention from both scholars and policymakers (Hondeghem et al., 2013; Hacklay, 2018), the actual engagement of citizens in governance may vary according to their involvement (Arnstein, 1969) and their contribution (Shirk et al., 2012; Elelman & Feldman, 2018; Hacklay, 2018). Hence, we approach the participative knowledge pattern from the viewpoint of citizen science. Citizen science serves in this case as an epistemological framework that bridges the gap between scientific research and society (Robinson et al., 2018; Hecker et al., 2018). The salience of this approach is that it operates at the junction between science, policy and society (Bonn et al., 2018). In turn, citizens are assumed to offer plausible solutions to rigid issues by introducing original and local knowledge to governance (Shirk et al., 2012; Vigar, 2017; Nascimento et al., 2018).

Finally, the **entrepreneurial pattern** relies on 'innovative' knowledge, which is invoked by policy actors, to structure governance around their particular policy goals (Dotti, 2016; Béland & Cox, 2016). Central to this pattern is John Kingdon's conception of *policy windows*, which enables the policy actors to connect problems, solutions and opportunities (Kingdon, 1984; Howlett, Ramesh & Perl, 2009). Within such a context, policy actors will eagerly invoke, produce, or transfer (new) knowledge, which is conclusive to their particular resources, interests and capacities (Dotti, 2016; Béland & Cox, 2016).

Notably, the previously described patterns are ideal types, and thus should be treated as such. In the case of Brussels' vélomobility governance, the presented knowledge patterns range from latent to self-evident practices and are, therefore, not *a priori* mutually exclusive – as the analysis will elucidate. While observing this heterogeneity is relevant to discern the knowledge documents on vélomobility in Brussels, we equally ambition to expose the modalities of the four knowledge patterns. Therefore, we questioned our interlocutors about their contribution, and how this coincides with the respective knowledge patterns.

2.3.3 Knowledge contributors

The objective of the third, and final dimension, is to justify that not all policy actors are equally involved in governance (Lindblom, 1968; Howlett, Ramesh & Perl, 2009); nor do they have the same contribution to it (Etzioni, 2008; Bardach, 2012). As a redress, we endorse the relevance of *knowledge contributors* in the knowledge-power nexus.

At the beginning of the theoretical framework, we argued that governance encompasses a dynamic process, in which both state and non-state actors from multiple institutional scales interact with each other. Although a large number of policy actors – including activists, academics, citizens, civil servants, consultants, policymakers and practitioners – partake in this interplay, evidence reveals that the involvement of policy actors varies in governance (Lindblom, 1968; Howlett, Ramesh & Perl, 2009). Etzioni (2008) and Bardach (2012) rationalise, for instance, that we can distinguish policy actors according to various prerequisites such as time, resources, practice and reputation.

Notably, several scholars identified some aggregations of policy actors, such as “policy-entrepreneurs” (Dolowitz & Marsh, 2000), “transfer agents” (Stone, 2004), “knowledge brokers” (Meyer, 2010), “policy mobilisers” (Wood, 2014) and “policy researchers” (Bardach, 2012; Colombo, 2018). However, we surmise that limited scrutiny has been given by the authors to how their knowledge imbues governance (van Kerkhoff, 2014; Wood, 2014; Dotti, 2016; Keblowski & Bassens, 2018).

To address this omission, we define *knowledge contributors* as policy actors that “seek to bridge the gap between knowledge and power” (McGann & Johnson, 2005:12) by invoking or producing knowledge in governance. Evidently, we do not consider this aggregation of policy actors as a homogenous group, since “several constellations of knowledge institutes and users exist side-by-side” (van Buuren & Edelenbos, 2004: 296). Accordingly, we differentiate the knowledge contributors according to their institutional position and input.

For the present purpose, we follow McGann and Johnson's (2005) 'think tank' typology. In conformity with their typology, we classify the knowledge contributors in five agencies, according to their institutional position (see table 2). Further, we utilise two segments of the Dolowitz and Marsh model (Dolowitz & Marsh, 2000) to differentiate their varying input. On the one hand, we learn from this model that there is a mixture of contributions to governance. Building on their argumentation, we assert, however, that knowledge contributors either produce or invoke knowledge to democratise, problematise, inform, monitor, support, oppose, mediate or solve public issues in governance (cf. Howlett, Ramesh & Perl, 2009; Colombo, 2018). On the other hand, the Dolowitz and Marsh model, equally, differentiates several means by which a policy actor can contribute to governance. Among other means, knowledge contributors can produce or invoke audits, benchmarks, inquiries, (strategic) reports and (scientific) research (Dolowitz & Marsh, 2000; McCann & Ward, 2010).

Position	Description
Autonomous, independent and private	Autonomous, independent private actors act from a particular interest. E.g. Activist, entrepreneurs and consultancies.
Quasi-independent	Quasi-independent actors are controlled by an interest group or agency that provides the majority of the funding. E.g. Civil society.
Higher education institutes	Public and private run research groups and academia.
Government-affiliated	Departments, institutions and administrations affiliated to the government.
Semi-governmental	Institutes and services that are set up and funded by the public authorities, but not part of their formal structure. E.g. Parastratal organisations.

Table 2: Think Tank Typology. Source: McGann & Johnson's (2005: 14). Note: The conceptualisation of the five organisational forms was supported by Hondeghe et al. (2013).

With this third dimension, we ambition to differentiate the (potentially) involved knowledge contributors. Making such a distinction is vital for the following analysis, especially since the GMP incorporated 400 (mobility) actors. Evidently, not all policy actors were equally involved, nor is their contribution to governance identical, as these vary according to their institutional position and input. In the scope of this dissertation, we therefore focus solely on the knowledge contributors that have contributed to Brussels' vélomobility. This delineation allows us to shed light on the structuring of the knowledge-power nexus.

3. Research design

This thesis exposes the role of knowledge (production) in Brussels' governance of vélomobility. The latter is by no means be a straightforward task, given Brussels' specific governance structure and the heterogeneity of knowledge. Hence, we introduce a new typology of knowledge (production) that is structured along three dimensions: the sources of the knowledge, the knowledge patterns and the position of knowledge contributors. In order to examine the aforementioned elements, we opt for a qualitative method of exploratory nature, consisting of two methodological steps.

3.1 Mapping study

The first methodological step consists of a "mapping study" (Cooper, 2016: 76), in which we sought to identify the utilised knowledge for Brussels' vélomobility and its respective knowledge contributors. To this end, we depart from the Regional Mobility Plan Good Move. From this basis, we were able to identify 58 knowledge documents related to Brussels' vélomobility. These include the Regional Bicycle Policy Audit (Tridée & Pro Velo, 2018a), Brussels' Mobility Diagnosis (Brussels Mobility, 2018), the reports of the bicycle observatory (Pro Velo, 2020a), the Bicycle Action Plan (City of Brussels, 2019) and the Chapters of the Mobility Knowledge Centre¹². Table 4, in Annex 1 provides an overview of all the mapped knowledge documents, related to Brussels' vélomobility. Previous documents were mapped through several (iterative) queries, during which we focused on references to audits, benchmarks, inquiries, (strategic) reports and (scientific) publications related to Brussels vélomobility.

Instructive sources in this regard were 79 Parliamentary questions and interpellations, as well as the quarterly publications of Brulocalis (see below), the BRIO-Matrix¹³ and the Brussels Studies Journal. Additionally, some local knowledge contributors provided us with unpublished reports, internal documents and studies which were imperative for our analysis. The identified documents were thereafter analysed through a *qualitative content analysis* – see section 3.3.

¹² In French, 'Cahiers de l'Observatoire de la mobilité'; in Dutch, 'Katernen van het Kenniscentrum van de mobiliteit'.

¹³ The Brio-Matrix, of Brussels, Information, Documentation and Research Centre (BRIO), consolidates information on 12 themes concerning the BCR and its periphery (BRIO, n.d.). Within the theme of mobility, 8 (relevant) sources were found with regards to Brussels' velomobility.

3.2 Expert interviews

Subsequently, we ambition, in the second methodological step, to gain in-depth insight into the role of knowledge (production) for Brussels' vélomobility. In order to expose the heterogeneity of knowledge and the dynamics that go with it, which we premised through our mapping study, we conducted seven semi-structured interviews with local experts. The interlocutors were on the basis of a "purposive sample" (Bryman, 2012: 418), allowing us to gather various notions from different knowledge contributors. For this work, we selected the respondents based on their contribution to Brussels' vélomobility and their (direct) involvement in the GMP, this with a specific focus on vélomobility. Although many other relevant policy actors could have been interviewed, these were not involved in the scope of this work as their competencies, position or role did not allow it. As Meuser and Nagel (2009) argue, not all knowledge contributors, despite their expertise and reputation, are a potential informant. Instead, they defend that an expert's role within the interview mostly depends on the research objectives of the interviewer and the contribution the expert can make to this (Meuser & Nagel, 2009). In order to mediate the latter, we queried the interviewees about the perceived contribution and role of the respective knowledge contributors.

The relevance of this approach is that it serves as a "systematising tool", able to provide new insight into the object of study (Bogner & Menz, 2009: 46). Hence, the interviews followed an interview guideline with open questions – see Annex 2. To expose the central research question, we accordingly questioned our interlocutors about three elements: (1) the Good Move Plan, with a specific focus on Brussels' vélomobility; (2) the sources and types of knowledge that underpin Brussels vélomobility; (3) and the role of the various knowledge contributors in the governance process.

The expert interviews were conducted between March and April 2020. Six out of the seven interviews happened by telephone or via other communication platforms as face-to-face interviews could not take place. Usually, the interviews lasted on average 50 minutes. These were conducted both in Dutch and French (depending on the interviewee) and, subsequently, transcribed in their respective language – see Annex 3. Note that for the analysis, the used insights, paraphrases and citations were translated to English. Lastly, the anonymity of the interviewee's is guaranteed in this work; we refer only to their position as knowledge contributor, as was defined in section 2.3.3.

3.3 Data-analysis

For the analysis, we opted for a “qualitative content analysis” (Bryman, 2012: 557) of both the mapped knowledge documents and the fully transcribed expert interviews. The content analysis was conducted in three steps:

First, we reviewed all the gathered content individually. Specific focus was given to the identification of recurring keywords, such as “active transport”, “administration”, “audits”, “benchmark”, “BELDAM”, “Bicycle Observatory”, “ByPAD”, “cyclability”, “fieldtrips”, “entrepreneurial”, “innovative”, “modal split”, “municipality”, “multimodality”, “networks”, and “participative”.¹⁴ Notably, these keywords were determined through an iterative process of (re)reading the content, in which attention was given to the unravelling of their context. In this way, we were able to identify, retrieve and deconstruct the structuring elements of the gathered content (Bryman, 2012).

In the second step, we categorised the identified keywords into six thematic units, which corresponds to our theoretical framework – Annex 4 provides an overview of the used thematic units and keywords. This step allowed us to vet the commonalities and inconsistencies between the gathered content from both the mapping and interviews (Meuser & Nagel, 2009).

In the third and final step of the content analysis, we reconstruct the thematic units. Moreover, we interpret the findings by merging, comparing and clarifying them with respect to each other and to the scientific literature. These were then further substantiated through references to the mapped knowledge documents. These proceedings allow us to uncover the invoked or produced knowledge, identify the knowledge patterns and report on the involvement of the knowledge contributors concerning Brussels’ vélomobility.

¹⁴ The presented keywords are *ad hoc* translated from French and Dutch

4. Analysis

While the Brussels Regional Mobility Plan Good Move served as the starting point of this work, we were able to identify through the research process 58 knowledge documents that structure Brussels' vélomobility – see Annex 1, table 4 for an overview. Despite the plethora of knowledge that is available on the topic, we assess that it is fragmented, heterogeneous and *open-ended*. Accordingly, the following analysis exposes why Brussels' vélomobility is more 'art' than science, to use Bardach's (2012) parlance. To this end, we first provide a brief overview of the status and characteristics of Brussels' vélomobility, after which we elucidate the identified modalities of Brussels' knowledge-power nexus.

4.1. Brussels' vélomobility

Similar to many other national and international cities, Brussels has experienced a recent revival of bicycle usage (cf. AMVB, 2018). This has especially been the case since 2018, when both social and political interest grew for the bicycle as a valuable means of transport (Tridée & Pro Velo, 2018a). At the social level, this is reflected in a stable growth in the number of cyclists; since 2010, Pro Velo assessed an average annual growth rate of 13% at its measuring locations (Pro Velo, 2019). As a result, Brussels' performance is intermediate rather than weak amongst international cities (Héran, 2018; BYPAD, n.d.).¹⁵ Parallel to this evolution, we can assess at the political level an increased attention for the promotion of the soft modes of transport. Although the BCR has had an active bicycle policy for 15 years (Tridée & Pro Velo, 2018b), the GMP only recently anchored cycling transversally along six axes (GoodMove, 2019).¹⁶

¹⁵ Héran (2018) compares the evolution of bicycle usage between Bordeaux, Brussels, Geneva, London, Lyon, and Paris from 2001 and 2017.

¹⁶ In order to address Brussels' mobility challenges, the Regional Mobility Plan Good Move has been drawn up along six axes: Good Neighbourhood, Good Service, Good Knowledge, Good Partner, Good Network and Good Choice. These axes epitomise Brussels' vision of mobility (GoodMove, 2019: 86).

In conjunction with the previous findings, we rationalise that the conception of mobility in Brussels' governance is evolving. Consider, for instance, among other trends, the (r)emergence of multimodality (Hubert et al., 2017), the introduction of shared mobility (Carton, 2018) and adaptations to low-traffic neighbourhoods (Janssens & Vanderstraeten, 2016), which all benefit the status and characteristics of cycling in an urban environment (Bell & Ferretti, 2016). Instructive for this thesis is that the preceding trends allow us to inquire into the Brussels context, departing from Till Koglin's conception of vélomobility (Koglin, 2013).

In line with Koglin's notion, we imply that Brussels' cycling policy "must be more than just a mobility policy" (interviewee 7, autonomous). It should rather be considered holistically, by acknowledging the power relations in governance in terms of representations, practices and materialisation (Koglin & Rye, 2014; Demoli & Lannoy, 2019). This is especially the case when we consider "[the] uncertainty about which disciplines, specialties, experts and skills to mobilise, [as] conflicts over values abound and [as] many people get intensely involved, with strong but divisive opinions" when it comes to cycling policy (Hoppe, 2002: 310). In concrete terms, the preceding manifests in the following ways:

- "Mobility is not just a mobility problem" (interviewee 5, quasi-independent). From the '1950s onwards, Brussels mobility issues were primarily approached from a technical point of view (Hubert, 2008; Zitouni & Telliers, 2013). In doing so, priority was given to infrastructural adaptations to ensure the traffic flow and accessibility of the automobile while providing for its future demand (Hubert, 2008). However, such an approach directly and indirectly contributed to air pollution (da Schio, de Geus, & Bouland, 2018), the segregation of the transport modes and urban spaces (Lannoy, 2016; AMVB, 2018), and introduced barriers along demographic, socio-economic and spatial features, in terms of accessibility, comfort and safety (Lebrun & Dobruskes, 2012; Timenco & Pro Velo, 2015; Pro Velo, 2017b; de Geus et al., 2019). Although the GMP partially abates previous issues (GoodMove, 2019), vélomobility serves, in this respect, as an additional rebuttal to traffic-based planning (Koglin & Rye, 2014). Namely, it contemplates the challenges and opportunities related to the politics of mobility (Cresswell, 2010)¹⁷ that derive through governance (Koglin & Rye, 2014). In other words, vélomobility does not reduce the bicycle to merely a mode of transport, but reckons the social, cultural, economic and political features of cycling within a specific context (Koglin, 2013).

¹⁷ Cresswell (2010) discusses the political elements that are related to the movement, representations and practices of mobility and immobility.

- Closely related is the fact that “mobility is a highly conflictual debate in Brussels” (interviewee 5). As was insinuated, Brussels transformed into a city tailored to the automobile in the second half of the twentieth century, at the expense of the other transport modes (Hubert, 2008; Deligne & Jaumain, 2009). Arguably, this metamorphosis both facilitated and catalysed the use of the automobile within, to and from the BCR (Demoli & Lannoy, 2019), which is still reflected in the path-dependency of Brussels’ mobility governance (cf. Hubert et al., 2013; Lebrun et al., 2014; Brandeleer et al., 2016; Strale, 2019). Since 1989, however, an effort was made to address the hegemonic nature of the automobile within Brussels in relation to the other modes of transport (Lannoy, 2016; Brussels Mobility, 2019). Although the previous Regional Mobility Plans IRIS (1998-2005) and IRIS-II (2010-2018) tried to re-equilibrate this ratio (Brussels Mobility, 2018),¹⁸ the GMP presently reintroduces the notion of multimodality with an emphasis on walking and cycling (GoodMove, 2019). Through this approach, it aims to juxtapose rather than *a priori* exclude the different modes of transport.
- Finally, we acknowledge that “Brussels has a planning illness” (interviewee 1, government-affiliated). Respondent 2 (government-affiliated) articulated this notion, arguing: “I am sure our policy does not have a problem with the factual underpinning. We follow up pretty well what the evolutions are, which levers work and so on. The problem lies in the implementation.” Similar observations were made by interviewees 3 (government-affiliated), 6 (autonomous) and 7, as well as in Tridée and Pro Velo (2018a; 2018b). This illustrates a prevailing feature of Brussels’ knowledge-power nexus, namely that “knowledge kills action” (Flyvbjerg, 1998: 34). Although this is a partial conclusion of this work, it is instructive to present it here, given the dyad of knowledge and governance. As Flyvbjerg further rationalised, “[the] (un)willingness to present rational argumentation or documentation may quite simply indicate its freedom to act and its freedom to define reality” (Flyvbjerg, 1998: 229). Concisely, and as we further substantiate in the course of the analysis, the knowledge-power nexus concerning vélomobility is by no means linear or uncontested (Koglin & Rye, 2014; Demoli & Lannoy, 2019). Instead, Brussels’ governance of (vélo)mobility is characterised by a myriad of policy actors that attempt to structure governance along their imaginaries, interests, objectives and resources (Hubert et al., 2013; Zitouni & Tellier, 2013; Kebrowski et al., 2018).

¹⁸ Both mobility plans already devoted attention to reducing Brussels’ auto-centrism (GoodMove, 2019). To this end, public transport served as an alternative to the automobile, at the detriment of the soft modes of transportation (Brussels Mobility, 2017).

4.2 The role of knowledge (production) in Brussels' vélomobility

Building on the previous arguments, we premise that vélomobility serves as an interesting reflector, both in theoretical and empirical terms, to inquire the modalities of Brussels' knowledge-power nexus. In the following section, we, therefore, not only present the findings of the analysis but also relate the scientific literature to it.

4.2.1 Brussels' knowledge sources of vélomobility

Overall, our inquiry nuances Dotti's notion that knowledge is a scarce resource in city-regions (Dotti, 2016: 55). Moreover, and in stark contrast to Dotti's premise, most of our respondents argued that Brussels' governance of vélomobility is underpinned by ample knowledge (interviewee 1, 2, 4, 6 and 7). Nevertheless, and expanding on the findings of Vaesen and Wayens (2018), we assessed that the invoked and produced knowledge is fragmented along its knowledge contributors and sources. Notably, the latter manifests in how Brussels' circuits of knowledge structure the governance of vélomobility (cf. Keblowski & Bassens, 2018).

A first observation we make, in this regard, is that Brussels invokes and produces a plethora of internal knowledge (documents) about vélomobility, consonant with various knowledge patterns, as we further discuss in section 4.2.2. However, Brussels' unique governance structure (cf. Van Wynsberghe, 2013; Van Haute et al., 2018), impedes their circulation. As respondent 1 accounted: "Undoubtedly [the governance of vélomobility] is based upon knowledge [...] We are, however, slowed down by administrations, inter-regional issues, and by a lack of political focus." In particular, we assess that there is no overarching governmental department for vélomobility within the BCR (Interviewee 1, 2, 3 and 7). Although there existed an informal bicycle cell for several years (interviewee 2), vélomobility is, presently, not structurally embedded in the Regional Administration of Brussels Mobility (Interviewee 1 and 7). Instead, the Regional Bicycle Manager acts as a spill figure in Brussels' governance of vélomobility, tasked to anchor vélomobility transversally; however, he does this without clear agency (interviewee 2). Nor is the Bicycle Manager *a priori* consulted by other directorates (Brussels-Capital Parliament, 2016; Tridée & Pro Velo, 2018a). Furthermore, interviewee 3 referred in this regard to the difficulty of gathering data in the BCR: "if we want to determine exactly the bicycle infrastructure, we should centralise information from the municipalities." Nevertheless, it is assessed that the elaboration and centralisation of knowledge on vélomobility proves more difficult (cf. Tridée & Pro Velo, 2018a).

Then again, the implied divergence, which results from a multi-layered fragmentation (interviewee 1, 2, 3 and 7), materialises to our understanding in the catalysation of a (newly) recognised local paradigm (Healey, 2013; Keblowski & Bassens, 2018). Our finding, in this respect, is that several knowledge contributors attempt to reconcile Brussels' knowledge concerning vélomobility as a response to its fragmentation (cf. Tridée & Pro Velo, 2018b; Tridée & Pro Velo, 2018c). Moreover, various formal and informal activities are organised within the BCR, aimed at consolidating, exchanging, substantiating and supporting knowledge. Although we were not able to expose the latent modalities, especially of the informal activities, the subsequent paragraphs discusses how these activities help orient Brussels' governance of vélomobility.

Judging by respondent 2 and 4 (quasi-independent), we assert that the BYPAD-Forum is the most salient activity within the circulation of knowledge related to Brussels' vélomobility. Following the BYPAD-audit (see below), the Regional Administration Brussels Mobility initiated a quarterly forum intending to consolidate knowledge and share ideas and practices about vélomobility amongst Brussels' policy actors (Tridée & Pro Velo, 2018a). To this end, the forum, on the one hand, supports in technical matters such as the elaboration of mobility plans and the design of bicycle infrastructure, and, on the other hand, promotes inter-regional benchmarks (interviewee 2 and 4). As such, Tridée and Pro Velo, who guide the forum, attempt to build internal capacity on vélomobility while fostering its circulation of knowledge in order to perpetuate its governance (Brulocalis, 2016; Tridée & Pro Velo, 2018a).

By the same token, we assess that Brulocalis¹⁹ contributes in two ways to Brussels' internal circuit of knowledge. First, Brulocalis' mobility cell quarterly publishes a *Guide to mobility and road safety*, which elaborates on the current situation of Brussels' (vélo)mobility, discusses inter- and intra-regional initiatives, and refers to compelling knowledge documents for Brussels' policy actors (Brulocalis, 2020). Second, the same cell monthly compiles the planned colloquiums, fieldtrips, trainings and seminars about Brussels' (vélo)mobility in its *Agenda of mobility and road safety* (Brulocalis, n.d.). Through these publications, Brulocalis intends to assist and advise Brussels' policy actors on (vélo)mobility (Brulocalis, n.d.).

¹⁹ Brulocalis is a non-profit organisation that is at the service of and managed by the local authorities of the BCR. As part of its services task, it has three missions: (1) protect and promote, (2) support and advice, (3) train and inform (Brulocalis, n.d.).

Furthermore, interviewee 5 hinted at the many formal and informal committees in which knowledge contributors partake, such as the already mentioned BYPAD-Forum, Brussels network of Mobility-advisors (CEMA) and the Regional Mobility Commission (see 4.2.2). Likewise, we learned from interviewee 4 that: "[...] regular meetings are organised with all bicycle associations, in order to create a coherent programme". The same respondent continued by saying: "We try here to avoid that two different organisations carry out the same project twice." Not inconsequential within these activities is the exchange of unwritten knowledge and the contingent contribution to knowledge documents (interviewee 1). In the scope of this thesis, however, we were unable to assess these informal sources of knowledge, either through our mapping study nor through the other expert-interviews.

Our second thematic observation is that the role of external knowledge within Brussels' vélomobility should not be neglected – especially given Brussels function as an (inter)national knowledge hub (Dotti et al., 2014; Vaesen & Wayens, 2014). Although respondent 1 asserted that "[Brussels] is confident enough to do it on its own", interviewee 6 posited that "the administration and consultancy firms have ample knowledge on mobility. However, many things ensue outside of this cordon". Several Parliamentary questions and interpellations affirm this notion by presenting the studies, campaigns and surveys ordered by the Regional Administration Brussels Mobility – see for example Brussels-Capital Parliament (2016; 2017a; 2017b; 2018a; 2018b; 2018c; 2019a; 2019b). Hence, the following paragraphs discuss the identified external sources of knowledge.

A first external source of knowledge that was identified are the international benchmarks. As interviewee 3 accounted: "We take a strong interest in what is happening in other cities: what works and what does not work [...]." Notably, the elaboration of the GMP was preceded by an international benchmark of six cities (GoodMove, 2016).²⁰ Similarly, the prospective study MOBIL2040 drew examples from London, Nantes, Québec, Strasbourg and Twente to underpin Brussels' (vélo)mobility vision for 2040 (Technum & Espace Mobilité, 2015). Despite this international focus (see also interviewee 2), the assessment is made that "much attention is devoted to French cities, which are not the major bicycle cities" (interviewee 7). A similar account was made by interviewee 2 and 4. This premise is compelling when considering that "cities are constituted through their relations with other places and scales" (Massey, 1991 in McCann & Ward, 2010: 175).

²⁰ The benchmark was carried out with comparable cities, in terms of size and functions. The benchmark included Barcelona, Bordeaux, Copenhagen, Geneva, Helsinki and Munich. With respect to vélomobility, the benchmarks were instructive for bicycle campaigns, bicycle networks and sequential policy making.

Accordingly, we assess that Brussels' policy transfer leans more towards the Francophone examples, rather than the northern cities like Amsterdam, Copenhagen and Hamburg.²¹ This may reflect Brussels' realism concerning the status of its vélomobility (cf. Vigar, 2017; Stead & Pojani, 2018); on the other hand, it also premises that Brussels' governance of vélomobility adheres to the politico-linguistic division, which could manifest in the absence of uniformity and ambition (cf. O'Connor and Vaesen, 2018).

A second source that was identified is the attendance of international conferences and the participation in other study trips. From our inquiry, we learn that the participation in the annual Velo-City Conference is encouraged amongst Brussels knowledge contributors (Brulocalis, 2016; Tridée & Pro Velo, 2018a). Moreover, the global conference gathers a wide range of policy-actors and knowledge contributors involved in vélomobility with the ambition to share (international) ideas, practices and expertise (European Cyclists' Federation, n.d.). Both interviewee 2 and 4 highlighted, in this regard, the instructiveness of the conference for Brussels' vélomobility. Interviewee 2, for example, stated that the initiative to generalise two-way traffic for cyclists originated from a Velo-City Conference, and Brussels has received praise for its *Bike for Brussels* initiative²² at the 2019 conference in Dublin (Copenhagenize, 2019). We also found that there were several international missions to Dubrovnik, London, Madrid and Rouen – in the form of events, workshops and colloquiums – related to vélomobility (Brussels-Capital Parliament, 2018a). Note, however, that the latter only includes the 2017 missions for employees of the Brussels Mobility Regional Administration. Other references to study trips were not identified during our research, though the premise is that every year similar trips are organised by other knowledge contributors.

The third external source of knowledge that was vetted is the potential role of social media. Although only one respondent addressed this issue, the scientific literature has pointed to the opportunities and challenges of social media in the circulation of knowledge (Hemsley & Mason, 2013; Ford & Mason, 2013). *In casu*, interviewee 6 accounted: "Over the past ten years, Twitter has been an extraordinary source of information. It allows us to examine what is happening abroad and in other contexts. [...] It is a source that allows us to resume, compare and probe what they implemented." The same respondent additionally highlighted the opportunity to circulate and stimulate ideas amongst local knowledge contributors via these media.

²¹ The same applies for the Walloon Region that eagerly looks to the BCR. For them, Brussels is the forerunner in terms of vélomobility (interviewee 2 and 4), while Flanders sets the bar higher by benchmarking northern examples (interviewee 2 and 7).

²² The *Bike for Brussels* campaign informs the general public about Brussels' bicycle facilities, the numerous initiatives, as well as the benefits and challenges of cycling in the BCR (Bike for Brussels, 2018).

In line with Demoli and Lannoy's "transformation of collective representations" (Demoli & Lannoy, 2019: 35, Authors' translation, original in French), we assess that the above-mentioned circulation of knowledge attempts to devise a (new) local paradigm around vélomobility (cf. Healey, 2013; Keblowski & Bassens, 2018). Then again, we should be aware that it is an incremental effort, accommodated by several knowledge contributors; as respondent 7 admitted, "[...] we are not yet at the point where [vélomobility] has been structurally embedded everywhere that it is happening by itself. It is still too much a matter where people have to pull. If we do not pull, it will come to a standstill again." In other words, Brussels' unique governance structure hampers the systematic consolidation of knowledge, causing knowledge contributors to engage in various, but often parallel and overlapping, endeavours. Based on the previous findings, we thus argue that Brussels' knowledge of vélomobility is not a scarce resource but is fragmented along epistemic and institutional structures (see also 4.2.3).

4.2.2 More 'art' than science?

Departing from the quadratic knowledge pattern (see Figure 1, above), we assess, from the mapping and the conducted interviews, that Brussels' vélomobility increasingly relies upon entrepreneurial and participative knowledge patterns. Arguably, the ongoing paradigm shift has weakened the significance of the concentrated approaches. This does not imply, however, that the technocratic and bureaucratic pattern have disappeared from Brussels' governance – these became at most more latent. Correspondingly, we argue that Brussels' knowledge patterns are heterogeneous and not *a priori* mutually exclusive. Within this context it is, therefore, appropriate to expose the modalities of the patterns, as well as how these resonate in the mapped knowledge documents.

The entrepreneurial pattern, most notably, resonates in Pro Velo's yearly Bicycle Observatory. In the scope of a framework agreement with the Regional Administration Brussels Mobility, the agency has organised annual bicycle censuses in the BCR since 1998. The objective of the annual count is to map the (local) cycling stream at various locations in Brussels, at several periods throughout the year (Pro Velo, 2020b). In addition to the observatory, Pro Velo also conducted various surveys about specific themes, such as *profile studies* (Pro Velo, 2014), *bicycle theft* (Pro Velo, 2013; Pro Velo, 2016), *Brussels' new cyclists* (Pro Velo, 2017) and *women on bicycles* (interviewee 2 and 4). In this way, as interviewee 4 accounted, "[Pro Velo's] studies aim to provide advice and adapt governance in terms of [vélomobility]". Four interlocutors followed previous notion, while highlighting the structuring role of Pro Velo for Brussels' vélomobility governance (Interviewee 1, 2, 3 and 7).

Furthermore, the interviewees also highlighted other salient knowledge documents, including BECI (2014, 2018), Espaces-Mobilités, ICEDD and Transitec (2017), GRACQ and Fietzersbond (2017), GRACQ, EUCG and Fietzersbond (2019), Hérán (2018), Technum and Espace-Mobilités (2015), Timenco (2012; 2016) and Timenco and Pro Velo (2015), which reflect the entrepreneurial approach (interviewee 1, 2, 4, 6 and 7). Typifying of previous knowledge documents is how these seek to reconcile challenges, solutions and opportunities in order to structure governance in favour of certain policy-objectives (cf. Béland & Cox, 2016). Respondent 5 elucidated, for instance, that BECI's Mobility Memorandum (BECI, 2018) closely relates to Good Move's ambitions, thus attempting to foster several ideas on vélomobility.²³ The vigour of previous knowledge document depends, however, on the degree to which these adhere to governance (cf. Dotti, 2016). Correspondingly, interviewee 6 stated: "if we have two thousand solutions, it does not mean that we have two thousand results."

Parallel to the entrepreneurial pattern, the experts equally highlighted the growing role of participative efforts, especially since the drafting of the GMP (interviewee 1, 3 and 7). Arguably, we distinguish in this analysis three manners by which the participative pattern resonates in Brussels' governance. Yet, as we will imply, the involvement and contribution of citizens appears to be *open-ended* (Meuser & Nagel, 2009).²⁴

Structural to Brussels' participative knowledge pattern are the international Bicycle Policy Audits (BYPAD), which were conducted for the BCR in 2004, 2007, 2010 and 2018. Summarily, the BYPADs are a means to evaluate the current bicycle policies and devise improvements based on their results. To this end, the audit assembles policymakers, the administration and users to reach a consensus on the achieved results and prospective actions (Tridée & Pro Velo, 2018a). Relevantly, interviewee 7 highlighted that the 2018 audit broadened the involvement of stakeholders through a forum of stakeholders. As a part of this process, the policy actors were not inquired about their opinion, but about their efforts and support of vélomobility (Tridée & Pro Velo, 2018b). Moreover, interviewee 4 and 7 accounted that the preceding was in conformity with the bottom-up approach of the GMP, which was under development at that time. Furthermore, the elaboration of the municipal bicycle action plans (e.g. City of Brussels, 2019), as part of the municipal BYPAD audits,²⁵ also appear to adhere to the open and participative nature of Good Move (Tridée & Pro Velo, 2018a).

²³ See, for example, the implementation of a general zone 30 and the encouragement for bike-sharing (BECI, 2018).

²⁴ Open-ended refers, in this case, to the uncertainty of a predefined or desired outcome (Meuser & Nagel, 2009: 29).

²⁵ Besides the regional BYPADs, the audit was also carried out for the 19 Brussels municipalities, on the initiative of the Brussels-Capital government, between 2012 and 2017 (Brulocalis, 2016).

Meanwhile, according to respondent 2, users are also involved through the Regional Mobility Commission. Particularly, in 2013, a division for the soft modes of transport was installed in order to incorporate users' recommendations to governance (Brussels Mobility, 2020). Interviewee 5, however, nuances the participatory nature of the preceding by implying that the formulated recommendations follow a rigid and formal bureaucratic process; While the users feel involved, they have doubts about the effectiveness of their input (Tridée & Pro Velo, 2018a).

In addition to the above-mentioned endeavours, citizens are more directly involved through participatory research projects. In 2017, on the initiative of the Brussels Capital Government, the *Ping if you care!* project was launched (Brussels-Capital Parliament, 2018d). The objective of this pilot was to collect data through the users about the infrastructural omissions and safety of cyclists (Mobiel21 & Bike Citizens, 2017). Similarly, *Fix My Street* is an initiative by the Regional Administration Brussels Mobility and the municipalities that allows citizens to report incidents in public spaces, such as faded road markings and potholes (CIRB, n.d.). Despite the value of bottom-up data collection for Brussels vélomobility (interviewee 1), it is assessed that previous data not necessarily flow to governance and the administrations (Tridée & Pro Velo, 2018a).

While the participative effort gains momentum, we should, however, be aware of its open-ended character. Interviewee 1, for instance remarked upon the ambiguity of Brussels' knowledge production of vélomobility. According to the respondent, "it is primarily the experts, who are involved on a daily basis with mobility, that were involved". Although interviewees 2 and 6 nuance the preceding statement, concerns about the involvement and contributions of citizens are clearly reflected in the scientific literature (cf. Arnstein, 1969; Shirk et al., 2012; Elelman & Feldman, 2018). In line with Hacklay (2018), the presented participative activities vary along their degree of citizen engagement and knowledge contribution. Undoubtedly, the GMP catalyses the participatory effort in terms of knowledge production (interviewee 1, 2, 4 and 7) but it remains to be seen how future activities will contribute to the governance of vélomobility.

The preceding remark is especially applicable when considering Brussels' tradition of technical interventions, with a history of substantial interference of the administration as a patient power (Zitouni & Tellier, 2013). Although the entrepreneurial and participative pattern challenge this approach, interviewee 2 elucidated that "many policy actors wish to keep certain axioms concerning the elaboration of knowledge". Further, the same respondent highlighted that the technocratic pattern imbues Brussels' governance of vélomobility in several manners.

First, the Regional Administration Brussels Mobility has been producing a range of technical reference documents since 2004. Moreover, the publications provide technical support to all the actors involved with vélomobility in Brussels. To date, ten publications have been published, which focus on several sub-topics such as *bicycle paths and suggestion lanes* (Brussels Mobility, 2007a), *cyclists and public transport* (Brussels Mobility, 2007b), *bicycles on roundabouts* (Brussels Mobility & BIVV, 2009), *bicycle parking* (Brussels Mobility, Fietzersbond & GRACQ, 2013) and *segregated bicycle infrastructure* (Brussels Mobility & OCW, 2018b). Despite the expertise that is being developed in these documents, the 2018 BYPAD revealed that these publications are only consulted to a small degree by local policy actors (Tridée & Pro Velo, 2018a). Similarly, respondent 2 hinted at the inadmissibility of governance towards these documents, despite their nature.

Second, the Regional Administration equally provides technical support through CEMA. CEMA organises biennially education and training courses on vélomobility for Brussels' mobility officials. From internal documentation, we learn that the trainings focus, *inter alia*, on general orientation, sustainable mobility, governance and implementation (Brussels Mobility & Timenco, 2016; Brussels Mobility, n.d.). Regarding this, respondent 2 and 7 highlighted that the courses attempt to strengthen the know-how and uniformity of implementation at the municipal and Regional level. Relatedly, Brulocalis' aforementioned *Guide to mobility and road safety* provides additional technical support to Brussels' policy actors about mobility-related issues (Brulocalis, 2019).

Third, respondent 2 referred to the *Chapters of the Mobility Knowledge Centre*. Moreover, in collaboration with researchers from both the Vrije Universiteit Brussel and Université Libre de Bruxelles, the Centre d'études sociologiques (CES) of the University of Saint-Louis is tasked with consolidating the knowledge about Brussels' (vélo)mobility. To this end, the knowledge centre has published six chapters to date, covering, amongst other issues, *transportation habits* (Lebrun et al., 2012), *the transport offer* (Lebrun et al., 2014) and *sharing public space* (Brandeleer et al., 2016) in the BCR. A parliamentary interpellation, states that the seventh, and forthcoming, publication will focus on cycling in the Brussels-Capital Region (Brussels-Capital Parliament, 2019a); this was later confirmed by interviewee 2 and 3. Furthermore, both respondents asserted that higher education institutions perform a salient role in the knowledge production of Brussels (vélo)mobility. Although we will discuss the preceding more in detail in section 4.2.3, we assess that the involvement and contribution of higher education institutes to vélomobility in governance remains marginal.

Although several knowledge documents were mapped that resonate with the bureaucratic pattern of knowledge utilisation – such as the Bicycle Action plan 2010-2015 (Brussels Mobility, 2011),²⁶ the Workplace Travel Plan (Brussels Mobility & Environment.Brussels, 2016) and Brussels’ mobility diagnoses (Brussels Mobility, 2017; Brussels Mobility, 2018; Brussels Mobility, 2019) – five of the seven interlocutors referred to the absence of systematic and consolidated knowledge to underpin governance. As respondent 6 problematised: “[They] have a vision and announce ambitions, but [they] do not know where [they] are starting from and where [they] are heading.” In this regard, interviewee 3 and 6 highlighted that there has not been reliable data available since the BELDAM inquiry of 2010.²⁷ Moreover, as interviewee 7 accounted: “Everything that is being said at present about the modal bicycle share builds on the BELDAM [...] all are thus hypotheses, extrapolations and interpretations of fragmented data.” Although the Bicycle Observatory monitors the evolution of the number of cyclists (Pro Velo, 2020a), this growth does not represent the modal bicycle share in the BCR (interviewee 7); for this, Brussels would need to monitor all its bicycle facilities and routes (Tridée & Pro Velo, 2018a). Respondent 2 and 7, however, implied that in the future previous omissions could be addressed through the Good Knowledge axis in the GMP²⁸ and the Bicycle Account.²⁹

Building on the aforementioned arguments, we conclude that Brussels’ knowledge about vélomobility is heterogeneous. Although most of the interlocutors were convinced that Brussels’ knowledge documents on vélomobility dovetails within the diffused patterns, our inquiry reaffirms the non-negligible role of the technocratic efforts (cf. Zitouni & Tellier, 2013). Furthermore, we assess that the invoked and produced knowledge primarily reflects the entrepreneurial pattern. Hence, it can be surmised that Brussels’ governance of vélomobility is, indeed, more art than science. However, presenting it as two-faced would distort the actual reality. Instead, we rationalise that Brussels’ knowledge on vélomobility has a *contested* nature (Howlett, Ramesh & Perl, 2009), rather than a *hegemonic*, as suggested by Keblowski and Bassens (2018).

²⁶ From the Regional BYPAD, we learned that the Bicycle Action Plan 2010-2015 was prolonged until 2019 (Tridée & Pro Velo, 2018a).

²⁷ Belgium Daily Mobility (BELDAM) survey is a decennial inquiry about the daily mobility of Belgians (BELDAM, 2010).

²⁸ The Good Knowledge axis ambitions to vigorously evaluate of Brussels’ mobility policies by prioritising knowledge and transparency of data (GoodMove, 2019: 94).

²⁹ By analogy to Copenhagen, the Regional Administration Brussels Mobility intends to set up a Bicycle Account (Brulocalis, 2020). Moreover, the inquiry includes an annual monitoring of traffic and mobility data, as well as measures, objectives and indicators in support of governance (Fietsberaad Vlaanderen, 2015; Tridée & Pro Velo, 2018a).

4.2.3 Brussels' knowledge contributors dictate reality

The observed fragmentation, within the context of knowledge sources, also expresses itself in the positioning of knowledge contributors. Once again, Brussels' unique institutional structure implicates a multitude of policy actors in governance. However, since not all policy actors are equally involved in Brussels' governance of vélomobility, Table 3 provides an overview of the identified knowledge contributors.³⁰ In the scope of this thesis, it is more instructive to expose the features of the vetted fragmentation, rather than to juxtapose their particular contributions. Notably, we assess that the knowledge contributors structure the dyad between knowledge and power. To illustrate this nexus, we borrow Flyvbjerg's conception of "rationality to power" (Flyvbjerg, 1998: 227) and Zitouni and Telliers' patient power (Zitouni & Tellier, 2013).

With *rationality to power*, Flyvbjerg refers to the policy actors who have the power to shape urban realities according to their imaginaries, interests, objectives and resources (Flyvbjerg, 1998). Arguably, Brussels has a long-standing tradition with this notion. Moreover, Brussels' auto-centric metamorphosis can be attributed to some spill-figures, such as Jos De Saeger and Henri Hondermarcq, who were convinced about the success of *modernism*, in terms of rationality and progress, and sequentially shaped Brussels to this imaginary (Hubert, 2008; Vandermotten, 2013). A similar tendency can be assessed contemporarily, based on a number of indications.

A first indication is the premise that knowledge is subordinated to power. As interviewee 1 assessed, knowledge is used as an *ad hoc* tool for the implementation of vélomobility. Correspondingly, interviewee 2 rationalised that knowledge is at the service of governance. Particularly, it was argued that "[knowledge] aids in taking the proper measures [...] and determines whether these actions are efficient". However, in line with Strassheim (2017a) and Colombo (2018), four respondents alluded to the non-neutral nature of knowledge. As we learn, for instance, from interviewee 3: "knowledge will often be subordinate to political decisions, while it is itself is not always biased." Arguably, power thus determines, according to a certain (political) agenda, what is regarded as knowledge (Flyvbjerg, 1998), and subsequently prescribes the implementation of vélomobility to this agenda (interviewee 1, 2, 3 and 4).

³⁰ Annex 1 provides an overview of the mapped knowledge documents; these are categorised according to their knowledge pattern and the positioning of their contributor(s). In sum, the observation is made that the autonomous, independent and private, as well as the quasi-independent knowledge contributors primarily produce knowledge that resonates with the entrepreneurial and participative knowledge patterns. Whereas, the higher education institutes and government-affiliated focus on the bureaucratic and technocratic pattern. For the semi-governmental actors, no knowledge documents were identified.

Position	Knowledge Contributors
Autonomous, independent and private actors act from a particular interest.	Bike Citizens, Espaces Mobilités, Copenhagenize Design Company, ICEDD, Mobiel21, Tractebel - Engie (before Technum), Transitec, Transport & Mobility Leuven and Tridée (before Timenco).
Quasi-independent actors are controlled by an interest group or agency that provides the majority of the funding.	BECI, BRAL, ECF, EUCG, Fietzersbond, GRACQ, CRR/OCW, Pro Velo, VIAS (before BIVV/IBSR).
Higher education institutes , consist of public and private run research groups and academia.	CES-USL, IGEAT-ULB, MFYS-VUB and MOBI-VUB.
Government-affiliated departments, institutions and administrations.	The Regional Administration Environmental Brussels, the Regional Administration Brussels Mobility, the municipalities (e.g. the City of Brussels), Perspective Brussels.
Semi-governmental actors are set up and funded by the public authorities but are not part of their formal structure.	Brulocalis, MIVB/STIB, NMBS/SNCB, Parking Brussels.

Table 4: Brussels' knowledge contributors to vélomobility. Source: Own composition. Note: Only the contributors whose knowledge documents have been mapped or referenced to are listed in the table.

Building on the first assessment, the second observation highlights the multi-layered nature of power. In particular, the admissibility to knowledge is reflected in its funding sources. Several Parliamentary interpellations and questions provide insight into this matter for vélomobility – see for example Brussels-Capital Parliament (2012; 2017c; 2018a; 2018e; 2019a; 2019b). Noteworthy is the fact that Brussels' governance finances most of the mapped knowledge documents, including Pro Velo's annual Bicycle Observatory and its surveys (interviewee 2, 3, 4 and 7); the Regional and municipal BYPAD's (Tridée & Pro Velo, 2018a); as well as various studies produced by consultancies, such as Espaces Mobilités, ICEDD, Technum, Transitec and Tridée, ordered via project calls (interviewee 3 and 6).³¹ Similarly, four interlocutors alluded to the positioning of higher education institutions; however, in the scope of this study, we assess that their contribution is

³¹ Our inquiry alludes to the salience of local knowledge contributors in Brussels' governance of vélomobility. Stemming from the interviews with respondent 1, 6 and 7, it is assumed that this is due to Brussels' unique governance structure.

marginal in relation to the abovementioned contributors.³² Only the already mentioned Chapters of the Mobility Knowledge Centre (interviewee 2 and 3) and a profiling study of non-cyclists (interviewee 1, 2 and 7)³³ could be linked to Brussels' governance of vélomobility. This latter assessment may be in line with the possible thresholds for higher education institutes in the Brussels context, as discussed by Vaesen and Wayens (2018). Arguably, the decision as to whether or not to fund certain knowledge contributors dictates the materialisation of Brussels' vélomobility (Flyvbjerg, 1998; Demoli & Lannoy, 2019).

Furthermore, the third, and final, observation asserts the friction between implementation and knowledge. As interviewee 1 stated: "[Brussels' vélomobility] is underpinned by knowledge [...] [however], it is incremental." The same respondent continued: "[the Brussels-Capital government] wanted to make progress, so without wasting too much time contemplating." Similarly, interviewee 2 accounted that some policy actors want to make use of the window of opportunity to execute, before the political momentum changes. The danger here, as interviewee 6 argued, is that "[some policy actors] act as project-managers, rather than a strategy-manager", which creates a void between the practices of policy actors and knowledge contributors. The preceding remark does not rationalise the absence or marginalisation of knowledge in Brussels governance but accentuates that "power seeks change, not [necessarily] knowledge" (Flyvbjerg, 1998: 36).

It is, however, needless to say that there is no unanimity amongst the policy actors about Brussels' future vélomobility (cf. Tridée & Pro Velo, 2018b; BECI, 2018; GRACQ, EUCG and Fietsersbond, 2019). As interviewee 1 accounted: "[...] we do not know what the future looks like, but we have to make sure we are resilient". In this respect, evidence highlights the value of patient power within Brussels' governance of (vélo)mobility, hence nuancing Flyvbjerg's rationality to power. Rather than proactively pushing for implementation, some knowledge contributors attempt to prepare the BCR for its future by introducing and producing knowledge on context-specific issues (Zitouni & Tellier, 2013). In this regard, the expert-interviews offered insight into how governmental-affiliated knowledge contributors attempt to perpetuate vélomobility.

³² A similar assessment is made by Tridée and Pro Velo (2018c) who conducted a stakeholder survey amongst Brussels' policy actors.

³³ The profiling study of non-cyclists was carried out by KWIN in partnership with the VUB-MOBI & MFYS. Copenhagenize France was commissioned to, subsequently, develop the action plan (Brussels-Capital Parliament, 2018a). Since then, the profiling study has been published by de Geus et al (2019).

The first assessment is that their knowledge is used to guide strategic projects (Tridée & Pro Velo, 2018a). As respondent 4 surmised: "The Regional Administration [Brussels Mobility] has ample freedom to choose which studies are ordered to support governance vis-à-vis the [Brussels-Capital government]." By the same token, we learn from interviewee 2 and 7 that the Regional Administration Brussels Mobility tactically contemplates its future actions via the above-mentioned technical reference documents or invoked knowledge. As interviewee 7, for instance, accounted: "[Timenco (2016)] was a deliberate, preliminary study; they knew it would provide important input [for the GMP]". Further, Brussels Mobility also relies on quasi-independent actors, such as Fietzersbond, GRACQ and OCW, to help elaborate their knowledge (interviewee 2). Although evidence suggests that the invoked and produced documents are not systematically consulted by other policy actors in other departments, directorates and institutions (Tridée & Pro Velo, 2018a), it is assessed that they help condition Brussels' future vélomobility (Tridée & Pro Velo, 2018c).

Furthermore, interviewee 3 assessed that Brussels' knowledge contributors have some leeway within Brussels' institutional structure to problematise and address specific issues based on their positioning and expertise. As interviewee 2 elucidated: "[procedural] agility has helped a lot, in recent years, to be able to resolve issues." Consider, for example, the initiatives mentioned above, such as CEMA and the BYPAD-Forums, which deviate from the top-down structure, and attempt to streamline the inter-regional vision and knowledge on vélomobility through technical consultations between Brussels' knowledge contributors (interviewee 2, 5 and 7). Nonetheless, the assessment is made that these initiatives are often imperceptible to the general public, most policy actors and more indirectly involved knowledge contributors (Tridée & Pro Velo, 2018a). Likewise, these initiatives juxtapose, to a great extent, the activities of Perspective Brussels, being, among others, the centralisation and diffusion of expertise and knowledge about Brussels' territorial and transversal matters (Perspective.Brussels, 2020).³⁴ Hence, it is assessed that the initiatives primarily bridge the mismatch between the municipalities and the Regional Administration Brussels Mobility but are less performative in bridging the omissions between the public institutions and their policy actors (interviewee 2, 6 and 7).

³⁴ Our analysis reveals that Perspective Brussels does not produce any knowledge documents on vélomobility to date. According to interviewee 3, however, it is likely that the Brussels Planning Bureau will have a role in this, in the future.

In sum, and as was introduced in section 4.2.1, Brussels' knowledge on vélomobility is fragmented along its knowledge sources and contributors. Concerning the latter, we can make two observations. First, several knowledge contributors attempt to bridge the absence of structural, systematic and transversal knowledge on vélomobility within Brussels' institutional structure, via several endeavours, to perpetuate its governance. Nevertheless, the second finding suggests that the governance of vélomobility both pushes and pulls knowledge. Ideally, policy actors push for implementation, while the knowledge contributions contemplate based on their expertise. In reality, however, it is assessed that the reciprocal nature of knowledge in Brussels' governance results in the open-ended character of vélomobility. Namely, ample knowledge is produced by the knowledge contributors, but as respondent 2 summarised, "Many decisions are the result of coincidence, of political entanglements, of things that have been pushed through or just happened by accident, and actually the conclusion is that this has greater impact on what happened".

5. Some conclusions about Brussels' knowledge-power nexus

The Brussels-Capital Region, like other national and international cities, has adopted a growing social and political interest for the bicycle as a valuable means of transport. Concomitantly, the Regional Mobility Plan Good Move intends to break with Brussels' past in terms of its transport and mobility governance. Evidence, however, suggested that Brussels' unique institutional structure impedes the governance of vélomobility (cf. Hubert et al., 2013; Ermans & Brandeleer, 2016; Genard, Berger & Vanhellemont, 2016).

Unlike a traditional policy analysis, this master's thesis, therefore, addressed the following research question: "which role does knowledge (production) have in Brussels' governance of vélomobility?". Additionally, we posed three sub-questions to elucidate the central research question: (1) "Is there any knowledge (production) in the field of vélomobility in Brussels? "; (2) "If so, who produces or invokes this knowledge, and what are its sources?"; and (3) "Which patterns of knowledge imbue Brussels' governance of vélomobility?".

From a theoretical point of view, these questions seemed relevant given the presence of a knowledge-power nexus in the scientific literature (Flyvbjerg, 1998; Hoppe, 2005; Colombo, 2018); the renaissance of evidence-based policy-making (Strassheim, 2017a; Parkhurst, 2017); and the limited scrutiny that has been given to how knowledge imbues governance (van Kerkhoff, 2014; Wood, 2014; Koblowski & Bassens, 2018). In response to these premises, a new typology of knowledge (production) was introduced, along three dimensions, to expose the modalities of Brussels' knowledge-power nexus. To examine these elements, a qualitative study of exploratory nature was conducted.

In the scope of the inquiry, we mapped 58 knowledge documents that structure Brussels' governance of vélomobility and interviewed seven local knowledge contributors. Stemming from the qualitative content analysis, and in response to the sub-question whether Brussels' has any knowledge (production) in the field of vélomobility, we conclude that Brussels' has a plethora of knowledge available on the subject. Next to the mapped knowledge documents, five interviewees alluded to the ample knowledge that is available within the BCR. Nevertheless, the assessment was, equally, made that Brussels' knowledge on vélomobility is fragmented, heterogeneous and open-ended. Concisely, these conclusions are based on the following findings.

First, and as an answer to the second sub-question, we learned from the knowledge sources and the involved knowledge contributors that Brussels' knowledge about vélomobility is fragmented along its epistemic and institutional structures. Although Brussels' governance produces and invokes knowledge on a wide range of subjects and from various knowledge contributors, evidence reveals that the knowledge on vélomobility has, to date, not been structurally, systematically nor transversally embedded. As a redress, several knowledge contributors engage in various, but often parallel and overlapping, endeavours to consolidate, exchange and support Brussels' knowledge, which helps materialise to our understanding the (newly) recognised paradigm around vélomobility. Nevertheless, we assess that the produced or invoked knowledge is not always utilised or shared amongst the policy actors of other departments, directorates and institutions (cf. Tridée & Pro Velo, 2018a).

The second conclusion answers the question about which knowledge patterns imbue Brussels' governance of vélomobility. Notably, the analysis revealed that Brussels' knowledge patterns, though predominately entrepreneurial, are heterogeneous and not *a priori* mutually exclusive. This assertion is corroborated by the majority of the interlocutors. However, and although the analysis substantiates their assessment, the inquiry also highlighted the non-negligible role of the technocratic efforts in Brussels' governance. Given this non-exclusive nature, the assertion is made that Brussels' knowledge on vélomobility has a contested, rather than a hegemonic nature.

Due to the heterogeneous and fragmented nature of Brussels' knowledge, as concluded before, we assess that the dyad between knowledge and power results in the open-ended character of Brussels' vélomobility. Moreover, and although an effort is made to structure Brussels' vélomobility on the basis of knowledge, a preponderance of the evidence suggests that governance both pushes and pulls the knowledge documents (cf. Béland & Cox, 2016). This is to say, ample knowledge is produced and invoked by Brussels' knowledge contributors, but their expertise is not always systematically shared or utilised by the policy actors for the governance of vélomobility. As interviewee 7 summarised: "Much research is being done, but each time it is something different. That is why it is difficult to get an overview of what we learn from this." Hence, we conclude that Brussels' vélomobility resonates more with an 'art' than science.

Introducing vélomobility as a nominator to inquire into the modalities of Brussels' knowledge-power nexus thus proved instructive. Following these conclusions, however, it is appropriate to reflect on the limitations of this contribution, as well as some potential avenues for further research.

The scope of the present research was concerned primarily with the knowledge-power nexus; however, it is clear that the policy actors tailor this dyad. As such, the inter-relations between the various knowledge contributions – in terms of their involvement and contribution – represent an avenue of further investigation, especially since several interviewees qualified that they had but limited notion of these dynamics. As a potential redress, further research could operate in a centrifugal manner: on the one hand, it might explore the positioning of a particular knowledge contributor, vis-à-vis the other contributors, within the knowledge-power nexus. On the other hand, our inquiry highlighted the presence of indirect knowledge sources, such as committees and social media; further research could explore how these sources gestate Brussels' governance of (vélo)mobility.

A final area of possible pursuit regards the potential of vélomobility, as a research subject, within the Brussels-Capital Region. Whereas this contribution focused on the role of knowledge in governance, it is premised that Koglin's conception provides a new basis to illuminate the challenges and opportunities of Brussels' recent mobility trend.

Bibliography

- AMVB. (2018). Vélo museum.Brussels. Arduin. 24(12).
- Arnstein, S. (1969). A Ladder of Citizen Participation. *Journal Of The American Planning Association*, 85(1), 24-34. doi: 10.1080/01944363.2018.1559388
- Arts, B., & Tatenhove, J. V. (2004). Policy and power: A conceptual framework between the 'old' and 'new' policy idioms. *Policy Sciences*, 37(3-4), 339-356. <https://doi.org/10.1007/s11077-005-0156-9>
- Banister, D. (2008). The sustainable mobility paradigm. *Transport Policy*, 15(2), 73-80. <https://doi.org/10.1016/j.tranpol.2007.10.005>
- Bardach, E. (2012). *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving 4E*. Thousand Oaks, Canada: SAGE Publications.
- BECI. (2014). *Het witboek over mobiliteit – 50 ideeën om Brussel weer vlot te krijgen*. Brussel: Beci (Brussels Enterprises Commerce & Industry)
- BECI. (2018). *Memorandum Mobiliteit*. Brussel: Beci (Brussels Enterprises Commerce & Industry)
- Béland, D. (2010). The Idea of Power and the Role of Ideas. *Political Studies Review*, 8(2), 145-154. <https://doi.org/10.1111/j.1478-9302.2009.00199.x>
- Béland, D., & Cox, R. H. (2016). Ideas as coalition magnets: coalition building, policy entrepreneurs, and power relations. *Journal of European Public Policy*, 23(3), 428-445. <https://doi.org/10.1080/13501763.2015.1115533>
- BELDAM. (2010). Belgium Daily Mobility. [online] Available at: <https://www.beldam.be>
- Bell, W., & Ferretti, D. (2015). What should planners know about cycling? In J. Bonham & J. Marilyn (Eds.), *Cycling Futures* (pp. 321-356). University of Adelaide Press.
- Bemelmans-Videc, M., Rist, R., & Verdung, E. (1998). *Carrots, sticks and sermons - policy instruments and their evaluation tools*. Transaction Publishers: New Brunswick.
- Bevir, M. (2012). *Governance: A Very Short Introduction*. Oxford, United Kingdom: Oxford University Press.
- Bike.Brussels. (2018). Bike for Brussels – Achievements. [online] Available at: <http://bike.brussels/nl/bfb>
- Bielak, Z. (2015). *From Pedal to People: The Social Effects of Biking*. Copenhagen: Rice University.
- Bogner, A. (2009). *Interviewing Experts*. London, UK: Palgrave Macmillan.
- Bonn, A., Hecker, S., Bowser, A., Makuch, Z., Vogel, J., & Haklay, M. (2018). Citizen science to foster innovation in open science, society and policy. In *Citizen Science Innovation in Open Science, Society and Policy* (pp. 465-484). UCL Press.
- Brandeleer, C., Ermans, T., Hubert, M., Janssens, I., Lannoy, P., Loir, C., Vanderstraeten, P. (2016). *Katernen van het Kenniscentrum van de mobiliteit in het Brussels Hoofdstedelijk Gewest – Het delen van de openbare ruimte in het Brussels Hoofdstedelijk Gewest*. Brussel: Brussel Mobiliteit.
- Brenner, N. (2004). *New State Spaces* (Vol. 3). Oxford University Press.
- BRIO. (n.d.). *Wat is de BRIO-Matrix?*. [online] Available at: <https://www.briobrusssel.be/node/14303>

- Brown, G. W., & Mclean, I. (2018). *The Concise Oxford Dictionary of Politics and International Relations* (4th edition). Oxford, United Kingdom: Oxford University Press.
- Brulocalis. (n.d.). *Agenda van de mobiliteit en de verkeersveiligheid*. [online] Available at: <https://www.avcb-vsgeb.be/nl/Publications/index-newsletters.html>
- Brulocalis. (n.d.). *Association of the City and the Municipalities of the Brussels-Capital Region*. [online] Available at: <https://avcb-vsgeb.be/fr/english/>
- Brulocalis. (2016). *Gids van de mobiliteit en de verkeersveiligheid Nr. 47*. [online] Available at: https://www.avcb-vsgeb.be/documents/publications/mobiliteitsgids_47.pdf
- Brulocalis. (2019). *Gids van de mobiliteit en de verkeersveiligheid*. [online] Available at: <https://www.avcb-vsgeb.be/nl/Publications/moniteur-de-la-mobilite.html>
- Brulocalis. (2020). *Studie voor een gewestelijke Bicycle Account*. [online] Available at: https://www.brulocalis.brussels/nl/actualites-full.html?news_id=7059&cmp_id=7
- Brussels-Capital Parliament. (2012). I.V. COM (2011-2012) Nr. 71. Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2016). I.V. COM (2015-2016) Nr. 8. Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2017a). I.V. COM (2016-2017) Nr. 80. Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2017b). I.V. COM (2016-2017) Nr. 84. Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2017c). Vragen en Antwoorden – Gewone Zitting 2017-2018 – 15 december 2017 (N. 35). Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2018a). Vragen en Antwoorden – Gewone Zitting 2018-2019 – 15 januari 2018 (N. 36). Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2018b). Vragen en Antwoorden – Gewone Zitting 2018-2019 – 15 juni 2018 (N. 41). Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2018c). I.V. COM (2017-2018) Nr. 72. Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2018d). I.V. COM (2017-2018) Nr. 105. Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2018e). Vragen en Antwoorden – Gewone Zitting 2018-2019 – 15 Maart 2018 (N. 38). Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2019a). Vragen en Antwoorden – Gewone Zitting 2018-2019 – 15 februari 2019 (N. 48). Brussel: Brussels Hoofdstedelijk Parlement
- Brussels-Capital Parliament. (2019b). Vragen en Antwoorden – Gewone Zitting 2018-2019 – 15 maart 2019 (N. 49). Brussel: Brussels Hoofdstedelijk Parlement
- Brussels Mobility. (n.d.). *Fietsvoorzieningen en bewegwijzering – CEMA*.
- Brussels Mobility. (n.d.). *Het FietsGEN*. [online] Available at: <https://mobilite-mobiliteit.brussels/nl/zich-verplaatsen/fiets/het-fietsgen>
- Brussels Mobility. (2006). *Fietsvademecum 1: Markering en signalisatie van beperkt eenrichtingsverkeer*. [online] Available at: https://mobilite-mobiliteit.brussels/sites/default/files/vm-1-sul_nl.pdf
- Brussels Mobility. (2007a). *Fietsvademecum 2: Uitvoering van gemarkeerde fietspaden en fietssuggestiestroken*. [online] Available at: <https://mobilite-mobiliteit.brussels/sites/default/files/vm-2-markering.pdf>
- Brussels Mobility. (2007b). *Fietsvademecum 3: Fietzers en openbaar vervoer*. [online] Available at: https://mobilite-mobiliteit.brussels/sites/default/files/vm-3-cyclistes_transport_en_commun_nl.pdf

- Brussels Mobility. (2011). *Fietsactieplan 2010-2015*. Brussel:Brussels Hoofdstedelijk Gewest.
- Brussels Mobility. (2012). *Strategisch Voetgangersplan – Brussel Voetgangersstad*. Brussel:Brussels Hoofdstedelijk Gewest.
- Brussels Mobility. (2017). *Diagnose – Waarom heeft het gewest onvoldoende fietsinfrastructuur ondanks de stijgende vraag?*. Brussel:Brussels Hoofdstedelijk Gewest.
- Brussels Mobility. (2018). *Diagnose – Hoe beoordelen we het IRIS2-plan, het vorige Gewestelijk Mobiliteitsplan?*. Brussel:Brussels Hoofdstedelijk Gewest.
- Brussels Mobility. (2019). *Diagnose – Waarom de openbare ruimte herverdelen, en het ruimtebeslag van de auto verminderen?* Brussel: Brussels Hoofdstedelijk Gewest.
- Brussels Mobility. (2020) De Gewestelijke Mobiliteitscommissie. [online] Available at: <https://mobilite-mobiliteit.brussels/nl/de-gewestelijke-mobiliteitscommissie>
- Brussels Mobility, & BIVV. (2009). *Fietsvademecum 4: Fietsvoorzieningen op rotondes*. [online] Available at: <https://mobilite-mobiliteit.brussels/sites/default/files/vm-4-amenagements-cyclables-giratoires-web-nl.pdf>
- Brussels Mobility, & BIVV. (2014). *Fietsvademecum 8: Fietsvoorzieningen op kruispunten*. [online] Available at: <https://mobilite-mobiliteit.brussels/sites/default/files/vm-8-fietsvoorzieningen-op-kruispunten-nl.pdf>
- Brussels Mobility, & Environment Brussels. (2016). *Bedrijfsvervoerplannen in het Brussels Hoofdstedelijk Gewest Balans van de situatie in 2014*. [online] Available at: https://data-mobility.brussels/media/indics/PDE_Rapport_2016_NL.pdf
- Brussels Mobility, Fietzersbond, & GRACQ. (2013). *Fietsvademecum 7: Fietsparkeervoorzieningen*. [online] Available at: https://mobilite-mobiliteit.brussels/sites/default/files/vm_7_-fietsvoorzieningen-web.pdf
- Brussels Mobility, & OCW. (2009a). *Fietsvademecum 5: Verhardingen voor fietsvoorzieningen*. [online] Available at: https://mobilite-mobiliteit.brussels/sites/default/files/vm-5-revetements_nl_web.pdf
- Brussels Mobility, & OCW. (2009b). *Fietsvademecum 6: Wegmarkeringen en verlichting voor fietsvoorzieningen*. [online] Available at: https://mobilite-mobiliteit.brussels/sites/default/files/vm-6-marquages_eclairage_nl_web.pdf
- Brussels Mobility, & OCW. (2018a). *Fietsvademecum 9: Fietsstraten*. [online] Available at: <https://mobilite-mobiliteit.brussels/sites/default/files/fietsvademecum9fietsstraten.pdf>
- Brussels Mobility, & OCW. (2018b). *Van de rijbaan afgescheiden fietsinfrastructuur*. [online] Available at: https://mobilite-mobiliteit.brussels/sites/default/files/fietsvademecum10deel1van_de_rijbaan_afgescheiden_fietsinfrast_ructuur_deel_i.pdf
- Brussels Mobility, & Timenco. (2016). Opleiding mobiliteitsadviseur: orientatie fietsbeleid.
- Brussels Mobility, & VIAS. (2017). *Fietsvademecum 3: Fietsongevallen in het Brussels Hoofdstedelijk Gewest*. [online] Available at: https://mobilite-mobiliteit.brussels/sites/default/files/2017_bhg_fietsrapport_nl_lr.pdf
- Bryman, A. (2012). *Social Research Methods*. New York: Oxford University Press.
- BYPAD. (n.d.). *Certified Cities and Regions*. [online] Available at: https://bypad.org/stories/certified_cities_regions
- Caramani, D. (2014). *Comparative politics*. Oxford, United Kingdom: Oxford University Press.

- Carton, V. (2018). Aanbod en gebruik van het openbaar vervoer in Brussel van 1950 tot 2017. *Brussels Studies*, 1–5. <https://doi.org/10.4000/brussels.1808>
- CIRB. (N.d.). *Fix My Street*. [online] Available at: <https://fixmystreet.brussels>
- City of Brussels. (2019). Bicycle Action Plan of the City of Brussels. Brussels.
- Cohen, M. D., March, J. G., & Olsen, J. P. (1972). A Garbage Can Model of Organizational Choice. *Administrative Science Quarterly*, 17(1), 1–25.
- Colombo, A. (2018). Boundaries, Bonding and Ten Golden Rules. In *Knowledge, Policymaking and Learning for European* (pp. 13–26). Edward Elgar Publishing.
- Colville-Andersen, M. (2018). *Copenhagenize*. London: Island Press
- Cooper, I. D. (2016). What is a "mapping study?" *Journal of the Medical Library Association : JMLA*, 104(1), 76–78. <https://doi.org/10.3163/1536-5050.104.1.013>
- Copenhagenize. (2019). *A yellow vision: how Brussels is marketing a city for bicycles*. [online] Available at: <https://copenhagenizeindex.eu/success-stories/yellow-vision-for-brussels-marketing-city-for-bicycles>
- Corijn, E. and Vermeulen, S. (2012). *Kan de stad de wereld redden?*. Brussel: VUBPRESS.
- Cresswell, T. (2010). Towards a politics of mobility. *Environment and Planning D: Society and Space*, 28(1), 17–31. <https://doi.org/10.1068/d11407>
- Davies, J. S., & Imbroscio, D. (2008). *Theories of Urban Politics* (2nd edition). Thousand Oaks, Canada: SAGE Publications.
- da Schio, N., de Geus, B., & Bouland, C. (2018). *A brief guide to the air of Brussels*. Brussels Studies Institute – Brussels Centre Observatory [BSI-BCO].
- de Geus, B., Wuytens, N., Deliëns, T., Keserü, I., Macharis, C., & Meeusen, R. (2019). Psychosocial and environmental correlates of cycling for transportation in Brussels. *Transportation Research Part A: Policy And Practice*, 123, 80–90. doi: 10.1016/j.tra.2018.09.005
- Deligne, C., & Jaumain, S. (2009). Introduction. Bruxelles 1958–2008: Le travail du souvenir. In Deligne, C., & Jaumain, S. (2009). *L'Expo 58, Un tournant dans l'histoire de Bruxelles*. Bruxelles: Le Cri
- Demoli, Y., & Pierre, L. (2019). *Sociologie des Mobilités*. Paris: La Découverte.
- Dolowitz, D. P., & Marsh, D. (2000). Learning from Abroad: The Role of Policy Transfer in Contemporary Policy-Making. *Governance*, 13(1), 5–23. <https://doi.org/10.1111/0952-1895.00121>
- Dolowitz, D. P., & Marsh, D. (2012). The Future of Policy Transfer Research. *Political Studies Review*, 10(3), 339–345. <https://doi.org/10.1111/j.1478-9302.2012.00274.x>
- Dotti, N. F., Spithoven, A., & Van Heur, B. (2014). The competitiveness of Brussels in European research. *Brussels Studies*, 81, 1–11.
- Dotti, N. F. (2016). Which knowledge for policy-making? The role of research in the Brussels water policy. <https://doi.org/10.13140/rg.2.1.3916.3041>
- Dotti, N. F. (2018). Knowledge that matters for the 'survival of unfittest': The case of the new Brussels' rail junction. *transport policy*, 63, 131–140.
- Doughty, K., & Murray, L. (2016). Discourses of Mobility: Institutions, Everyday Lives and Embodiment. *Mobilities*, 11(2), 303–322. <https://doi.org/10.1080/17450101.2014.941257>

- Elelman, R., & Feldman, D. (2018). The future of citizen engagement in cities—The council of citizen engagement in sustainable urban strategies (ConCensus). *Futures*, 101, 80–91. <https://doi.org/10.1016/j.futures.2018.06.012>
- Ermans, T., Brandeleer, C. (2016) *Ruimte voor de fiets*. In Brandeleer, C., Ermans, T., Hubert, M., Janssens, I., Lannoy, P., Loir, C., & Vanderstraeten, P. (2016). *Katernen van het Kenniscentrum van de mobiliteit in het Brussels Hoofdstedelijk Gewest – Het delen van de openbare ruimte in het Brussels Hoofdstedelijk Gewest*. Brussel: Brussel Mobiliteit.
- Espaces Mobilités, ICEDD, & Transitec. (2017). *Masterplan stationnement vélo*. Brussel: Brussel Mobility
- European Cyclists' Federation. (n.d.). *Velo-City*. [online] Available at: <https://ecf.com/projects/velo-city>
- Etzioni, A. (1975). A comparative analysis of complex organizations. London, Free Press.
- Etzioni, A. (2008). The Unique Methodology of Policy Research. In Moran, M., Rein, M., & Goodin, R. (2008). *The Oxford Handbook of Public Policy*. Oxford: Oxford University Press, 833–43.
- Featherstone, M., & Venn, C. (2006). Problematizing Global Knowledge and the New Encyclopaedia Project. *Theory, Culture & Society*, 23(2–3), 1–20. <https://doi.org/10.1177/0263276406065779>.
- Fietsberaad Vlaanderen. (2015). *Bicycle Account geeft feiten en cijfers fietsen weer (Kopenhagen)*. [online] Available at: <https://fietsberaad.be/praktijk/bicycle-account-geeft-feiten-en-cijfers-fietsen-weer-kopenhagen/>
- Flyvbjerg, B. (1998). *Rationality and Power – Democracy in Practice*. The University of Chicago Press, Chicago.
- Ford, D. P., & Mason, R. M. (2013). Knowledge Management and Social Media: The Challenges and Benefits. *Journal of Organizational Computing and Electronic Commerce*, 23(1–2), 1–6. <https://doi.org/10.1080/10919392.2013.748603>
- Frumkin, H. (2002). Urban Sprawl and Public Health. *Public Health Reports*, 117(3), pp.201– 217.
- Fukuyama, F. (2013). What is governance? *Governance: An International Journal of Policy, Administration, and Institutions*, 26(3), 347–368. <https://doi.org/10.1111/gove.12035>
- Genard, J., Berger, M., & Vanhellemont, L. (2016). L'architecture des débats: les imaginaires mobilisés. Brussels Studies Institute – Brussels Centre Observatory [BSI-BCO].
- Gilley, B. (2017). Technocracy and democracy as spheres of justice in public policy. *Policy Sciences*, 50(1), 9–22. <https://doi.org/10.1007/s11077-016-9260-2>
- GoodMove. (2016). Be samen slim mobile – Benchmarks. Brussel: Brussels Hoofdstedelijk Gewest.
- GoodMove. (2019). Ontwerp van het Gewestelijk Mobiliteitsplan. Brussel: Brussels Hoofdstedelijk Gewest.
- GRACQ, & Fietsersbond (2017). Halftijdse fietsbeleidsevaluatie.
- GRACQ, EUCG, & Fietsersbond. (2019). Mémoire Région Bruxelles-Capital.
- Haklay, M. (2018). Participatory citizen science. In *Citizen Science Innovation in Open Science, Society and Policy* (pp. 52–62). UCL Press.
- Head, B. (2015). Toward More “Evidence-Informed” Policy Making?. *Public Administration Review*, 76(3), 472–484. doi: 10.1111/puar.12475
- Healey, P. (2013). Circuits of Knowledge and Techniques: The Transnational Flow of Planning Ideas and Practices. *International Journal of Urban and Regional Research*, 37(5), 1510–1526. <https://doi.org/10.1111/1468-2427.12044>

- Hecker, S., Haklay, M., Bowser, A., Makuch, Z., Vogel, J. and Bonn, A. (2018). Innovation in open science, society and policy – setting the agenda for citizen science. In *Citizen Science Innovation in Open Science, Society and Policy* (pp. 1-23). UCL Press.
- Henderson, J. (2006). Secessionists automobility: racism, anti-urbanism, and the politics of automobility in Atlanta, Georgia. *International Journal of Urban and Regional Research*, 30(2).
- Hemsley, J., & Mason, R. M. (2013). Knowledge and Knowledge Management in the Social Media Age. *Journal of Organizational Computing and Electronic Commerce*, 23(1-2), 138-167. <https://doi.org/10.1080/10919392.2013.748614>
- Héran, F. (2018). *Système vélo*. [online] Available at: <https://fr.forumviesmobiles.org/reperes/systeme-velo-12437>
- Hondeghem, A., Van Dooren, W., De Rynck, F., Verschuere, B., & Op de Beeck, S. (2013). *Handboek bestuurskunde*. Brugge: Vanden Broele.
- Hood, C. (1983). *The tools of government*. Chatham House: New Jersey.
- Hood, C. (2007). Intellectual Obsolescence and Intellectual Makeovers: Reflections on the Tools of Government after Two Decades. *Governance*, 20(1), 127-144. <https://doi.org/10.1111/j.1468-0491.2007.00347>
- Hoppe, R. (1999). Policy analysis, science and politics: from “speaking thruth to power” to “making sense together”. *Science and Public Policy*, 26(3), 201-210.
- Hoppe, R. (2002). Cultures of public policy problems. *Journal of Comparative Policy Analysis: Research and Practice*, 4(3), 305-326. <https://doi.org/10.1080/138769802084126859>
- Hoppe, R. (2005). Rethinking the science-policy nexus: From knowledge utilization and science technology studies to types of boundary arrangements. *Poiesis Und Praxis*, 3(3), 199-215. <https://doi.org/10.1007/s10202-005-0074-0>
- Howlett, M., 2009. Government communication as a policy tool: A framework for analysis. *Canadian Political Science Review*, 3(2), 23-37. URL: <https://ojs.unbc.ca/index.php/cpsr/article/view/134>.
- Howlett, M., Ramesh, M., & Perl, A. (2009). *Studying Public Policy. Policy Cycles and Policy Subsystems*. Don Mills, Ontario: Oxford University Press.
- Hubert, M. (2008). Expo '58 en “Koning Auto”. Welke toekomst voor de grote wegeninfrastructuur in Brussel ? *Brussels Studies*, (22).
- Hubert, M., Lebrun, K., Huynen, P., & Dobruszkes, F. (2013). *De dagelijkse mobiliteit in Brussel: uitdagingen, instrumenten en prioritaire werkdomeinen*. *Brussels Studies*, 71(56), 1-29.
- Hubert, M., Corijn, E., Neuwels, J., Hardy, M., Vermeulen, S., & Vaesen, J. (2017). *Du « grand piétonnier » au projet urbain: atouts et défis pour le centre-ville de Bruxelles*. Brussels Studies Institute – Brussels Centre Observatory [BSI-BCO].
- Janssens, I., & Vanderstraeten, P. (2016). Gedeelde ruimten: van concept tot uitvoering. In Brandeleer, C., Ermans, T., Hubert, M., Janssens, I., Lannoy, P., Loir, C., Vanderstraeten, P. (2016). *Katernen van het Kenniscentrum van de mobiliteit in het Brussels Hoofdstedelijk Gewest – Het delen van de openbare ruimte in het Brussels Hoofdstedelijk Gewest*. Brussel: Brussel Mobiliteit.
- Jessop, B. (2016). Territory, politics, governance and multispatial metagovernance. *Territory, Politics, Governance*, 4(1), 8-32. <http://doi.org/10.1080/21622671.2015.1123173>
- Jouve, B. (2005). From government to urban governance in Western Europe: A critical analysis. *Public Administration and Development*, 25(4), 285-294. <https://doi.org/10.1002/pad.385>
- Kalenga-Mpala, R., & Wautelet, A. (2018). *Bruxelles, capitale des chercheurs?* [online] Available at http://ibsa.brussels/fichiers/publications/focus-de-libs/focus_23_mars_2018

- Kębłowski, W., & Bassens, D. (2018). "All transport problems are essentially mathematical": the uneven resonance of academic transport and mobility knowledge in Brussels. *Urban Geography*, 39:3. 413-437. <https://doi.org/10.1080/02723638.2017.1336320>
- Kenworthy, J. R., & Laube, F. B. (1999). Patterns of automobile dependence in cities: An international overview of key physical and economic dimensions with some implications for urban policy. *Transportation Research Part A: Policy and Practice*, 33(7-8), 691-723. [https://doi.org/10.1016/S0965-8564\(99\)00006-3](https://doi.org/10.1016/S0965-8564(99)00006-3)
- Kingdon, J.W. (1984). *Agendas, Alternatives, and Public Policies*. Boston: Little, Brown and Company.
- Kingham, S., & Tranter, P. (2015). Cycling and sustainable transport. In J. Bonham & J. Marilyn (Eds.), *Cycling cultures* (pp. 131-152). University of Adelaide Press.
- Koglin, T. (2013). *Vélobility – A critical analysis of planning and space*. Lund University.
- Koglin, T., & Rye, T. (2014). The marginalisation of bicycling in Modernist urban transport planning. *Journal of Transport and Health*, 1(4), 214-222. <https://doi.org/10.1016/j.jth.2014.09.006>
- Kuehnhanss, C. (2018). Nudges and nodality tools: New developments in old instruments. In *Routledge Handbook of Policy Design* (pp. 227-242). Abingdon, Verenigd Koninkrijk: Routledge. <https://doi.org/10.4324/9781351252928-15>
- Lagasse, N. (2012). Organisatie van de bevoegdheden tussen Gewest en gemeenten in Brussel: de tegenstelling tussen TINA en NIMBY overstijgen. *Brussels Studies*, 61, 1-13. <https://doi.org/10.4000/brussels.1105>
- Lannoy, P. (2016). Het delen van de openbare ruimte programmeren in een gemotoriseerde stad: de evolutie van de principes voor de inrichting van de openbare weg in Brussel na de Tweede Wereldoorlog. In Brandeleer, C., Ermans, T., Hubert, M., Janssens, I., Lannoy, P., Loir, C., Vanderstraeten, P. (2016). *Katernen van het Kenniscentrum van de mobiliteit in het Brussels Hoofdstedelijk Gewest – Het delen van de openbare ruimte in het Brussels Hoofdstedelijk Gewest*. Brussel: Brussel Mobiliteit.
- Lebrun, K., & Dobruszkes, F. (2012). Nieuwe GEN-stations voor Brussel? Uitdagingen, methodes en beperkingen. *Brussels Studies*. doi: 10.4000/brussels.1075
- Lebrun, K., Hubert, M., Dobruszkes, F. & Huynen, P. (2012). *Katernen van het Kenniscentrum van de mobiliteit in het Brussels Hoofdstedelijk Gewest – Het vervoersaanbod in Brussel*. Brussel: Brussel Mobiliteit.
- Lebrun, K., Hubert, M., Huynen, P., & Patriarche, P. (2014). *Katernen van het Kenniscentrum van de mobiliteit in het Brussels Hoofdstedelijk Gewest – De verplaatsingsgewoontes in Brussel: diepte analyse*. Brussel: Brussel Mobiliteit.
- Lindblom, C. (1959). The science of "muddling through". *Public Administration Review*, 19 (2), 79-88. <http://www.jstor.org/stable/973677>
- Lindblom, C. (1968) *The policy-making process*. Prentice Hall, Englewood Cliffs.
- Loir, C. (2013). Voir et être vu – Se promener à Bruxelles aux XVIII^e et XIX^e siècles. In Patrimoines Bruxelles. (2013). *Bruxelles, m'as-tu vu?*. Bruxelles: Patrimoines Bruxelles.
- Loir, C. (2016). Van de gedeelde ruimte tot de modale segregatie: het lange transformatieproces van de openbare ruimte (1775-1936). In Brandeleer, C., Ermans, T., Hubert, M., Janssens, I., Lannoy, P., Loir, C., Vanderstraeten, P. (2016). *Katernen van het Kenniscentrum van de mobiliteit in het Brussels Hoofdstedelijk Gewest – Het delen van de openbare ruimte in het Brussels Hoofdstedelijk Gewest*. Brussel: Brussel Mobiliteit.
- Lukes, S. (2005) *Power: A Radical View* (2nd ed.), Houndmills: Palgrave.
- Massey, D. (1991). A global sense of place. *Marxism Today*, (June), 24-29.

- May, X., Ermans, T., & Hooftman, N. (2019). Bedrijfswagens: diagnostiek en uitdagingen van een fiscaal regime. *Brussels Studies*. <https://doi.org/10.4000/brussels.2477>
- McCann, E. J. (2008). Expertise, Truth, and Urban Policy Mobilities: Global Circuits of Knowledge in the Development of Vancouver, Canada's 'four Pillar' Drug Strategy. *Environment and Planning A: Economy and Space*, 40(4), 885–904. <https://doi.org/10.1068/a38456>
- McCann, E. (2011). Urban policy mobilities and global circuits of knowledge: Toward a research Agenda. *Annals of the Association of American Geographers*, 101(1), 107–130.
- McCann, E., & Ward, K. (2010). Relationality/territoriality: Toward a conceptualization of cities in the world. *Geoforum*, 41(2), 175–184. <https://doi.org/10.1016/j.geoforum.2009.06.006>
- McCool, D. (1998). The Subsystem Family of Concepts: A Critique and a Proposal. *Political Research Quarterly*, 51(2), 551–570. <https://doi.org/10.1177/106591299805100213>
- McGann, J., & Johnson E. (2005), *Comparative Think Tanks, Politics and Public Policy*, (1st ed., pp.11-17). Edward Elgar Publishing
- Meuser, M., & Nagel, U., (2009). The Expert Interview and Changes in Knowledge Production. In Bogner, A., Littig, B., & Menz, W. (2009). *Interviewing experts*. Palgrave Macmillan.
- Meyer, M. (2010). The Rise of the Knowledge Broker. *Science Communication*, 32 (1), 118–27.
- Mobiel21, & Bike Citizens. (2019). *Ping if you care!* [online] Available at <https://www.mobiel21.be/campagnes-en-projecten/ping-if-you-care>
- Montgomery, C. (2013). *Happy city*. New York: Farrar, Straus and Giroux.
- Nascimento, S., Miguel, J., Iglesias, R., Owen, R., Schade, S., & Shanley, L. (2018). *Citizen science for policy formulation and implementation*. In *Citizen Science Innovation in Open Science, Society and Policy* (pp. 219-240). UCL Press.
- O'Connor, K., & Vaesen, J. (2018). Between Scylla and Charybdis? Twenty-Five Years Administating the Contested Region of Brussels. *Administration & Society*, 50(6), 835–855. <https://doi.org/10.1177/0095399715607931>
- Oja, P., Titze, S., Bauman, A., de Geus, B., Krenn, P., Reger-Nash, B. & Kohlberger, T. (2011). Health benefits of cycling: a systematic review. *Scandinavian Journal of Medicine & Science in Sports*, 21(4), pp.496-509.
- Parkhurst, J. (2017). *The Politics of Evidence From evidence-based policy to the good governance of evidence*. Abingdon, Verenigd Koninkrijk: Routledge.
- Perspective.Brussels. (2020). *Over ons | perspective.brussels*. [online] Available at: <https://perspective.brussels/nl/over-ons/over-ons>
- Pierre, J. (1999). Models of urban governance: The institutional dimension of urban politics. *Urban Affairs Review*, 34(3), 372–396. <http://doi.org/10.1177/10780879922183988>
- Pro Velo. (2011a). Brussels Bicycle Observatory 2010. Brussels: Pro Velo.
- Pro Velo. (2011b). Enquête sur les obstacles à l'utilisation du vélo en ville. Bruxelles: Pro Velo.
- Pro Velo. (2012a). Brussels Bicycle Observatory 2011. Brussels: Pro Velo.
- Pro Velo. (2012b). Cyclistes bruxellois, quels sont vos itinéraires ?. Bruxelles: Pro Velo.
- Pro Velo. (2013a). Brussels Bicycle Observatory 2012. Brussels: Pro Velo.
- Pro Velo. (2013b). Enquête sur le vol de vélos pour tous les cyclistes bruxellois. Bruxelles: Pro Velo.

- Pro Velo. (2014a). Brussels Bicycle Observatory 2013. Brussels: Pro Velo.
- Pro Velo. (2014b). Profiel van de respondenten. Brussel: Pro Velo.
- Pro Velo. (2015). Brussels Bicycle Observatory 2014. Brussel: Pro Velo.
- Pro Velo. (2016a). Brussels Bicycle Observatory 2015. Brussel: Pro Velo.
- Pro Velo. (2016b). Vols des vélos. Bruxelles: Pro Velo.
- Pro Velo. (2017a). Brussels Bicycle Observatory 2016. Brussel: Pro Velo.
- Pro Velo. (2017b). Les nouveaux cyclistes à Bruxelles depuis 2015. Bruxelles: Pro Velo.
- Pro Velo. (2018). Brussels Bicycle Observatory 2017. Brussels: Pro Velo.
- Pro Velo. (2019). Brussels Bicycle Observatory 2018. Brussels: Pro Velo.
- Pro Velo. (2020a). Brussels Bicycle Observatory 2019. Brussels: Pro Velo.
- Pro Velo. (2020b). Bicycle Observatory. [online] Available at: <https://www.provelo.org/nl/page/brussels-fietsobservatorium>
- Pro Velo., & Transport and Mobility Leuven. (2014). Impact en potentieel van fietsgebruik voor de economie en de werkgelegenheid in het Brussels Gewest. Brussel: Brussel Mobiliteit
- Pucher, J., & Buehler, R. (2017). Cycling towards a more sustainable transport future. *Transport Reviews*, 37 (6), 689-694. DOI: 10.1080/01441647.2017.1340234
- Radaelli, C. M. (1995). The role of knowledge in the policy process. *Journal of European Public Policy*, 2(2), 159-183. <https://doi.org/10.1080/13501769508406981>
- Robinson, J. (2006). *Ordinary Cities: Between Modernity and Development*. Routledge, London.
- Robinson, L., Cawthray, J., West, S., Bonn, A., & Ansine, J. (2018). Ten principles of citizen science. In *Citizen Science Innovation in Open Science, Society and Policy* (pp. 27-40). UCL Press.
- Shirk, J., Ballard, H., Wilderman, C., Phillips, T., Wiggins, A., & Jordan, R. et al. (2012). Public Participation in Scientific Research: a Framework for Deliberate Design. *Ecology And Society*, 17(2). doi: 10.5751/es-04705-170229
- Smith, M. (2016). Energy Research & Social Science Cycling on the verge: The discursive marginalisation of cycling in contemporary New Zealand transport policy. *Chemical Physics Letters*, 18, 151-161. <http://doi.org/10.1016/j.erss.2016.02.002>
- Stead, D., & Pojani, D. (2018). Learning across cities and regions: the limits to transferring "best practice". *Knowledge, Policymaking and Learning for European Cities and Regions*, 58-68. <https://doi.org/10.4337/9781786433640.00014>
- Stone, D., 1999. Learning lessons and transferring policy across time, space and disciplines. *Politics* 19, 51-59.
- Stone, D. (2004). Transfer agents and global networks in the 'transnationalization' of policy. *Journal of European Public Policy*, 11(3), 545-566. <https://doi.org/10.1080/13501760410001694291>
- Strale, M. (2019). Verplaatsingen tussen Brussel en de rand: sterk uiteenlopende situaties. *Brussels Studies*, 1-19. <https://doi.org/10.4000/brussels.2837>
- Strassheim, H. (2015). Politics and Policy Expertise: Towards a Political Epistemology . In *Handbook of Critical Policy Studies* (pp. 319-340). Cheltenham, Verenigd Koninkrijk: Edward Elgar Publishing.

- Strassheim, H. (2017a). Trends towards evidence-based policy formulation. In *Handbook of Policy Formulation* (pp. 504–521). Cheltenham, Verenigd Koninkrijk: Edward Elgar Publishing. <https://doi.org/10.4337/9781784719326>
- Strassheim, H. (2017b). Bringing the political back in: reconstructing the debate over evidence-based policy. A response to Newman. *Critical Policy Studies*, 11(2), 235–245. <https://doi.org/10.1080/19460171.2017.1323656>
- Suh, J. (2015). Economics of everyday cycling and cycling facilities. In J. Bonham & J. Marilyn (Eds.), *Cycling Futures* (pp. 107–130). University of Adelaide Press.
- Technum, & Espaces Mobilités. (2015). *MOBIL2040 – Brussels Refreshed*. Brussel: Brussel Mobiliteit
- Timenco. (2012). Fiets-GEN Studie – eindrapport. Brussel: Timenco
- Timenco, & Pro Velo. (2015). *Analyse de la cyclabilité des voiries en Région de Bruxelles-Capitale*. Brussel: Timenco
- Timenco. (2016). *Multimodale wegenspecialisatie in het Brussels Hoofdstedelijk Gewest*. Brussel: Timenco
- Tridée, & Pro Velo. (2018a). *BYPAD Brussel Hoofdstedelijk Gewest*. Brussel: Brussel Mobiliteit
- Tridée, & Pro Velo. (2018b). *BYPAD Stakeholdersbevraging*. Brussel: Brussel Mobiliteit
- Tridée, & Pro Velo. (2018c). *BYPAD Trends Cijfers over de fiets in Brussel*. Brussel: Brussel Mobiliteit
- Vaesen, J. (2008). *Osmose, dwang en tegenmacht?*. Brussel, VUB-doctoraatsverhandeling.
- Vaesen, J., & Wayens, B. (2014). Het hoger onderwijs en Brussel. *Brussels Studies*, 76. <https://doi.org/10.4000/brussels.1215>
- Vaesen, J., Wayens, B. (2018). Knowledge serving the city? Brokerage, production and sharing in Brussels. In *Knowledge, Policymaking and Learning for European* (pp. 96–108). Edward Elgar Publishing.
- Vandermotten, C. (2014). *Bruxelles, une lecture de la ville*. Bruxelles: Éd. de l'Université de Bruxelles.
- Vanhellemont, L., & Vermeulen, S. (2016). De aanleg van de voetgangerszone in het Brusselse stadscentrum (2012-...). Een analyse van (het discours van) het procesverloop. *Brussels Studies Institute – Brussels Centre Observatory [BSI-BCO]*.
- Van Buuren, A., & Edelenbos, J. (2004). Why is joint knowledge production such a problem? *Science and Public Policy*, 31(4), 289–299. <https://doi.org/10.3152/147154304781779967>
- Van Haute, E., Deschouwer, K., Gaudin, T., Janssens, R., Kavadias, D., Mares, A., ... Tibbaut, A. (2018). *Besturen in Brussel – Eindrapport*. [online] Available at: <https://assets.bruzz.be/2018-12/besturen%20in%20Brussel.pdf>
- van Kerkhoff, L. (2014). Knowledge Governance for Sustainable Development: A Review. *Challenges In Sustainability*, 1(2). doi: 10.12924/cis2013.01020082
- van Nispen, F., & Scholten, P. (2017). The Utilization of Expert Knowledge in Times of Crisis: Budgetary and Migration Policies in the Netherlands. *European Policy Analysis*, 3(1), 81–99. <https://doi.org/10.1002/epa2.1014>
- Van Wynsberghe, C. (2013). Brussel en Washington: twee ingesloten federale hoofdsteden, twee vergelijkbare metropolitane experimenten?. *Brussels Studies*, 66, 1–12.
- Vigar, G. (2017). The four knowledges of transport planning: Enacting a more communicative, trans-disciplinary policy and decision-making. *Transport Policy*, 58, 39–45. <https://doi.org/10.1016/j.tranpol.2017.04.013>

- Urry, J. (2004). The 'System' of Automobility. *Theory, Culture & Society*, 21(5), 25–39.
<https://doi.org/10.1177/0263276404046059>
- Wildavsky, A. (1979). Speaking truth to power: the art and craft of policy analysis.
- Zitouni, B., & Tellier, C. (2013). Hoe de technische overheidsdiensten aan de stad bouwen. Strategisch time management bij het ontwerp van het plan voor stadsuitbreiding in de 19e eeuw en bij de aanleg van de (pre) metro in de 20e eeuw in Brussel. *Brussels Studies*, (64).
- Weimer, D. L., & Vining, A. R. (2015). *Policy Analysis: Concepts and Practice*. Routledge.
- Wood, A. (2014). Moving policy: Global and local characters circulating bus rapid transit through South African cities. *Urban Geography*, 35(8), 1238–1254.

Appendixes

Annex 1: Typology of knowledge documents

	Autonomous, independent and private	Quasi- independent	Higher education institutes	Government affiliated	Semi- governmental
Bureaucratic	N/A	N/A	N/A	BELDAM (2010); Brussels Mobility (2011; 2017; 2018; 2019); Brussels Mobility & Environment.Brussels (2016); City of Brussels (2019).	N/A
Entrepreneurial	Technum & Espace Mobilités (2015); Timenco & Pro Velo (2015); Timenco (2012; 2016); Espaces Mobilités, ICEDD, & Transitec (2017).	BECI (2014; 2018); Pro Velo (2011a; 2011b; 2012a; 2012b; 2013a; 2013b; 2014a; 2014b; 2015; 2016a; 2016b; 2017a; 2017b; 2018; 2019; 2020a); GRACQ & Fietzersbond (2017); GRACQ, EUCC & Fietzersbond (2019).	Héran (2018).	N/A	N/A
Participative	Tridée & Pro Velo (2018a; 2018b; 2018c); Mobiel21 & Bike Citizens (2019).	N/A	N/A	Brussels Mobility (2020); CIRB (n.d.)	N/A
Technocratic	N/A	Pro Velo & Transport and Mobility Leuven (2014).	Lebrun et al. (2012); Lebrun et al. (2014); Brandeleer et al. (2016); De Geus et al. (2019).	Brussels Mobility (2006; 2007a; 2007b; 2012); Brussels Mobility & BIVV (2009; 2014); Brussels Mobility & OCW (2009a; 2009b; 2018a; 2018b); Brussels Mobility & VIAS (2017); Brussels Mobility, Fietzersbond & GRACQ (2013); Brussels Mobility & Timenco (2016); Brussels Mobility (n.d.).	N/A

Table 4: Typology of knowledge documents. Source: Own composition.

Annex 2: Interview Guide

Since the interviews were conducted both in Dutch and French, the reader can respectively find the interview guide in both languages.

INTRODUCTIE	
Formele bedanking.	
Akkoord geluidsopname.	Bent u akkoord dat dit gesprek wordt opgenomen om het later te analyseren? Uw anonimiteit als individu wordt gegarandeerd.
Het onderzoek kort voorstellen.	Afgaande op het 'Good Move' Mobiliteitsplan kunnen we aannemen dat het BHG, een toegenomen interesse vertoont inzake de zachte transportmodi. Toch kunnen we veronderstellen dat deze 'omwenteling' niet onomstreden is. In tegenstelling tot een traditionele beleidsanalyse biedt de thesis aandacht aan de kennisproductie van het Brussels Hoofdstedelijk fietsbeleid. Concreet onderzoek ik wie, welke kennis heeft aangeleverd bij het opstellen van het Gewestelijk Mobiliteitsplan 'Good Move', dit met een specifieke focus op fietsen.

OPENINGSVRAGEN	
Het 'Good Move' Mobiliteitsplan (GMP).	- Welke zijn de belangrijkste troeven van het 'Good Move' Mobiliteitsplan (GMP) volgens [naam organisatie]? - Wat zijn de voornaamste uitdagingen van het GMP? - Zijn er aspecten van GMP die volgens [naam organisatie] beter kunnen?
Realisatie van het GMP.	- Hoe verschilt de aanpak waarop het GMP tot stand kwam volgens u (bijv. t.a.v. IRIS-II)? - Zijn er overeenkomsten? - Wat zijn de voor- en nadelen hiervan?

OORSPRONG (kernvragen)	
Betrokkenheid bij het opstellen van het GMP?	- [Hoe] is [<i>naam organisatie</i>] betrokken geweest bij het opstellen van GMP? - In welke fase(s) van het GMP zijn jullie betrokken geweest [verkennende fase; oriëntatiefase; ontwikkelingsfase; consolidatiefase; algemene uitwerking (meerdere antwoorden mogelijk)]?
Aandacht voor (vélo)mobiliteit?	- Op welke wijze heeft [<i>naam organisatie</i>] bijgedragen aan het (opstellen van het) GMP? [Bijv. a.d.h.v. studies, (wetenschappelijk) onderzoek, advies, strategische nota's, diagnoses, visie-documenten enz.]. - Had de desbetreffende inbreng een specifieke (thematische) focus? - Welke mobiliteitsalternatieven en -uitdagingen heeft [<i>naam organisatie</i>] binnen de context van het GMP aangekaart? Hoe werden deze onderbouwd of behandeld?
Intern of extern geproduceerde kennis.	- Verzamelen, evalueren of analyseren jullie 'in-huis' de hiervoor genoemde inbreng [betreffende (vélo)mobiliteit]? Of doen jullie hiervoor beroep op externe (mobiliteits)actoren? • <u>Indien intern</u>: a.d.h.v. eigen studiedienst; (thematische) specialisatie(s); specifieke methodologie (bijv. ByPad-methode) enz. • <u>Indien extern</u>: [uitbesteding] studies, onderzoek en andere activiteiten; welke (mobiliteits)actoren; deelname aan conferenties en commissies [binnen- en buitenland?]; bench-markers en field-trips [binnen- en buitenland?] enz. • <u>Combinatie</u>?

VORM (kernvragen)	
Fundamenteel of toegepaste kennis?	- Welke aard had deze inbreng (data, informatie, kennis)? - Welke doelstelling(en) heeft deze input? - Wordt dergelijke input geproduceerd voor een specifiek doelpubliek?

Kennispatroon.	- Hoe kadert jullie inbreng in de volgende kennispatronen? • <u>Bureaucratisch</u>: De aangeleverde kennis komt tot stand d.m.v. een hiërarchisch proces, waarbij 'neutrale' vakkennis voorop wordt gesteld. • <u>Entrepreneurial</u>: De inbreng steunt op innovatieve (zowel bestaande als nieuwe) informatie, die gebaseerd is op de eigen middelen, kennis en belangen, met als intentie de beleidsresultaten te beïnvloeden. • <u>Participatief</u>: De aangeleverde kennis wordt geproduceerd door het betrekken van gebruikers en burgers. • <u>Technocratisch</u>: De aangeleverde kennis wordt geproduceerd door (aangestelde) experts die prioriteit geven aan technische oplossingen voor (maatschappelijke) uitdagingen. Verklaar nader.
Transparantie van de kennis(productie).	- Is voorgaande inbreng publiek toegankelijk of zijn dit (voornamelijk) werkdocumenten?
Vorm van het fietsbeleid.	- Is het Brussels Hoofdstedelijk fietsbeleid volgens u onderbouwd door kennis? - Wie zijn volgens u de voornaamste bijdragers hiertoe? - Wat is hun bijdrage? - Hoe kan deze bijdrage worden versterkt? - Hoe verhoudt de voorgenoemde bijdrage zich tot de kennispatronen?

BETROKKENHEID (kernvragen)							
Positie van [naam organisatie] binnen het Brussels mobiliteitsbeleid.	- Welke rol heeft [naam organisatie] binnen het Brussels mobiliteitsbeleid? - Hoe differentieert [naam organisatie] zich van de overige/betrokken mobiliteitsactoren?						
	Heeft [naam organisatie] volgens u kunnen <u>wegen op</u> het fietsbeleid?		Helemaal eens (1)	Eens (2)	Neutraal (3)	Oneens (4)	Helemaal oneens (5)
	[Naam organisatie]						

In welke mate hebben volgende mobiliteitsactoren <u>bijgedragen</u> aan het GMP/ fietsbeleid?		Noodzakelijke bijdrage (1)	Grote bijdrage (2)	Neutraal (3)	Kleine bijdrage (4)	Helemaal geen bijdrage (5)	
	Zelfstandige actoren en privé						
	Middenveldorganisaties						
	Universiteit gerelateerd						
	Overheidsinstellingen						
	Semioverheid						
In welke mate zijn volgende mobiliteitsactoren <u>betrokken</u> geweest bij het GMP/ onderbouwen van fietsbeleid?		Zeer betrokken (1)	Betrokken (2)	Neutraal (3)	Weinig betrokken (4)	Helemaal niet betrokken (5)	
	Zelfstandige actoren en privé						
	Middenveldorganisaties						
	Universiteit gerelateerd						
	Overheidsinstellingen						
	Semioverheid						

Afwezigheid mobiliteitsactoren?						
In welke mate hebben de voorgenoemde mobiliteitsactoren kunnen <u>wegen op</u> het GMP/ fietsbeleid?		Zeer belangrijk (1)	Belangrijk (2)	Neutraal (3)	Niet belangrijk (4)	Helemaal niet belangrijk (5)
	Zelfstandige actoren en privé					
	Middenveldorganisaties					
	Universiteit gerelateerd					
	Overheidsinstellingen					
	Semioverheid					

SLOTVRAGEN	
Heeft Brussel het potentieel een fietsstad te worden?	
Hoe kadert vélomobiliteit in de lange termijnvisie van het BHG? Is deze visie volgens u onderbouwd?	
Wat vindt u van volgende stelling: “ <i>A city can be friendly to people, or it can be friendly to cars, but it can’t be both</i> ”. Is deze stelling toepasselijk voor Brussel?	
Zijn er elementen die we hebben besproken en die u belangrijk acht verder toe te lichten?	
Dankwoord.	

Remerciement. Phrase d'amorce :

Avant de commencer, je voudrais vous remercier pour le temps que vous m'avez accordé pour cet entretien.

Dans le cadre de mon mémoire de fin d'études, que j'écris sous la supervision de Prof. Joost Vaesen, je essaie de décrire la production de connaissances dans la 'politique cyclable' de la Région Bruxelles-Capitale. Concrètement, j'aimerais savoir qui a fourni, quelles connaissances lors de la réalisation du plan de mobilité régional Good Move, en mettant l'accent sur le vélo.

Pour cela j'ai décidé d'interroger plusieurs experts/acteurs/institutions qui étaient impliqués dans le processus.

Il y a trois thèmes que j'aimerais discuter avec vous. Les premières questions portent, entre autres, sur l'origine du plan Good Move. Ensuite, j'ai quelques questions sur la forme du plan Good Move. Et finalement sur la participation des acteurs.

QUESTIONS INTRODUCTIVES	
Le plan de mobilité "Good Move"(PMG).	- Selon vous, quelles sont les éléments principaux du plan de mobilité "Good Move"? - Et quelles sont les défis ? - Y a-t-il des aspects qui peuvent être améliorés selon vous ?
Réalisation des PMG.	- À votre avis, en quelle mesure l'approche du plan Good Move diffère-t-elle avec par exemple les plans précédents ou avec les plans des mobilités des communes ? - D'autre part, y a-t-il des ressemblances ? - Quels sont les avantages et les inconvénients ?

ORIGINE	
Participation à l'élaboration des PMG ?	- Comment est-ce que [nom de l'organisation] a été impliqué dans la réalisation du plan Good Move? Quel était votre rôle dans le processus ? - Dans quelle(s) phase(s) avez-vous participé ? [Phase exploratoire ; phase d'orientation ; phase de développement ; phase de consolidation ; élaboration générale (plusieurs réponses possibles)] ?
Attention pour la (vélo)mobilité ?	- De quelle manière [nom de l'organisation] a contribué à le plan mobilité ? [Par exemple au moyen d'études, de recherches (scientifiques), de conseils, de notes stratégiques, de diagnostics, de documents de vision, etc.] - La contribution en question a-t-elle un objectif (thématique) spécifique ? Par exemple, le cyclisme.

Est-ce que les éléments de connaissance sont produits en interne ou en externe ?	- Collectez, évaluez ou analysez-vous soi-même les données ? Ou faites-vous appel à des acteurs externes pour cela ? • <u>En interne</u> : par votre propre département d'études ; spécialisation(s) (thématique(s)) ; méthodologie spécifique (par exemple la méthode ByPad), etc. • <u>Si externe</u> : études, recherches et autres activités [externalisation] ; quels acteurs (de la mobilité) ; participation à des conférences et comités [dans le pays et à l'étranger] ; benchmarks et visites de terrain [dans le pays et à l'étranger], etc. • <u>Combinaison</u> ?
--	---

FORME	
Connaissances fondamentales ou appliquées ?	- Quelle était la nature de ces apports (données, informations, connaissances) ? - Quel(s) objectif(s) poursuit cette contribution ? Par exemple, problématique, résolution de problèmes, information, soutien, etc. - Cet apport est-il produit pour un public spécifique ? Par exemple, commissionnés, d'intérêt général, de défense des intérêts, etc.
Dans la littérature, nous <u>distinguons</u> quelques modèles de connaissances.	- Comment est-ce que l'apport [nom de l'organisation] s'inscrit dans les modèles de connaissance suivants ? • <u>Bureaucratique</u> : les connaissances fournies sont créées au moyen d'un processus hiérarchique, dans lequel les connaissances "neutres" sont mises en avant. • <u>Entrepreneurial</u>: l'apport est basé sur des informations innovantes (existantes et nouvelles) avec l'intention d'influencer les résultats de la politique. • <u>Participatif</u> : Les connaissances fournies sont produites en impliquant les utilisateurs et les citoyens. • <u>Technocratique</u> : les connaissances produites par des experts qui donnent priorité aux solutions techniques pour les défis (<u>sociét-aux</u>).
Transparence des connaissances (produites).	- Les contributions précédentes sont-elles accessibles au public ou s'agit-il (principalement) de documents de travail ?

Forme de la politique cyclable.	- Selon vous, la politique cyclable de la Région Bruxelles-Capitale est-elle fondée sur la connaissance ? - Selon vous, qui sont les contributeurs le plus important ? - Quelle est leur contribution ? Comment renforcer cette contribution ? - Quel est le lien entre la contribution susmentionnée et les modèles de connaissance ?
---------------------------------	---

PARTICIPATION							
Position de [nom de l'organisation] au sein de la politique de mobilité de Bruxelles.	- Comment est que [nom de l'organisation] se différencie-t-elle des autres acteurs qui était impliqué ?						
Selon vous, a-t-elle réussi à influencer la politique cycliste ?		Tout à fait d'accord (1)	D'accord (2)	Neutre (3)	Pas d'accord (4)	Pas du tout d'accord (5)	
Dans quelle mesure les acteurs de la mobilité suivants ont-ils <u>contribués</u> à la politique cyclable/le plan Good Move?		Très impliqué (1)	Impliqué (2)	Neutre (3)	Pas impliqué (4)	Pas du tout impliqué (5)	
	Indépendant						
	Société civile						
	Universitaires						
	Agences gouvernementales						
	Semi-gouvernement						
Dans quelle mesure les acteurs de la mobilité suivants ont-ils été <u>impliqués</u> dans la réalisation du plan Good Move/ la politique cycliste ?		Très impliqué (1)	Impliqué (2)	Neutre (3)	Pas impliqué (4)	Pas du tout impliqué (5)	
	Indépendant						
	Société civile						
	Universitaires						
	Agences gouvernementales						
	Semi-gouvernement						

Absence d'acteurs de la mobilité ?						
Dans quelle mesure les acteurs de la mobilité ci-dessus mentionnés ont pu peser sur le plan Good Move/ la politique cycliste ?		Très important (1)	Important (2)	Neutre (3)	Pas important (4)	Pas du tout important (5)
	Indépendant					
	Société civile					
	Universitaires					
	Agences gouvernementales					
	Semi-gouvernement					

QUESTIONS DE CLÔTURE	
Est-ce que Bruxelles a le potentiel pour devenir une ville cycliste ?	
Comment la véломobilité s'inscrit-elle dans la vision à long terme de la RBC ? À votre avis, cette vision est-elle fondée ?	
Que pensez-vous de la prochaine déclaration : <i>"A city can be friendly to people, or it can be friendly to cars, but it can't be both"</i> . Cette thèse est-elle applicable à Bruxelles ?	
Y a-t-il un élément dont nous n'avons pas parlé et qui vous semble important à mentionner?	
Remerciement.	

Annex 3: Transcribed Interviews

Due to the length of the transcribed interviews they are not included in this document. These can be consulted online via: https://drive.google.com/drive/folders/1AkC9_CZiMjfRFPtEzEwzYDEddFmvRO9J?usp=sharing

If there are issues with the link above, the transcriptions can be requested from the author by mail: Mathis.Saeyns@gmail.com

Annex 4: Qualitative Content Analysis

Thematic units	Keywords
Knowledge Contributors	Academia, administration, bicycle organisations, Brussels Mobility, consultancies, non-state actors, municipalities, network, implementation, universities and private, public.
Knowledge Patterns	Academia, administration, BELDAM, Bicycle Observatory, bureaucratic, BYPAD, citizens, engineers, entrepreneurial, openness, participative, scholars, technocratic,
Knowledge-power nexus	Agenda-setting, consensus, conflict, funding, implementation, hierarchy, interests, knowledge production, knowledge utilisation, neutrality, policy, politics and status-quo.
Knowledge Sources	Benchmarks, Brulocalis, bicycle cel, bicycle cities (e.g. Amsterdam, Copenhagen, Munich), BYPAD-Forum, (bicycle) campaigns, CEMA, circulation, committees, conferences, fieldtrips, networks, Regional Mobility Commission, social media, surveys, transfer, research and Velo-City.
Multi-level Governance	Administration, centralisation, Brussels-Capital Region, fragmentation, governance, government, incrementalism, mismatch, municipalities, municipal scale, pluralism, region, regional scale and transversally.
Véломobility	Accessibility, auto-centrism, bicycle, bicycle network, commuting, cyclability, Good Move, IRIS-I & II, liveability, (shared) mobility, 'Mobility as a Service', multimodality, modal split, soft and active modes of transport, superblocks, pedestrianisation, public space, sustainability.