## REGONAL REGIONAL INFRASTRUCTURE VITH LOCAL FABRICS

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### RECONCILING REGIONAL INFRASTRUCTURE WITH LOCAL FABRICS

SUPERVISED RESEARCH PROJECT

SUBMITTED TO PROF. NIK LUKA IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF URBAN PLANNING

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#### ABSTRACT

Infrastructure is enjoying a renaissance as a subject of study and intervention in many academic and professional fields. It is simultaneously seen as an important vector for public investment to bolster development, maintain quality of life, and react to global ecological crises. While in many ways this marks a return to historic urbanistic concerns with infrastructure, much of the current scholarship still focuses on how to introduce infrastructure to an urban setting or re-purpose it after its usefulness has expired. Little work has yet to be done on how to grapple with existing infrastructure whose functionality has been maintained. This study examines two similar instances of a type of regional linear infrastructure—underground heavy rail in established urban settings-with regards to how the surface open spaces have been designed and planned. Three main objectives were identified: 1) to review the literature that links infrastructure to urbanism, landscape discourses, and public space/public life discourse, 2) to document the cases of the Jonction Nord-Midi in Brussels and the Mount-Roval Tunnel in Montréal and 3) to provide a generative analysis the outcome of which was generalizable strategies for intervention on similar infrastructural conditions. I propose four strategies that respond to the existing conditions within infrastructure sites and that operationalize some of the concepts identified in the literature review. The first strategy focuses on recognizing the particularities of the site and establishing an appropriate project framework from a planning perspective. The second strategy is aimed at determining what kind of an experience should be prioritized on the surface of infrastructural sites. The third strategy is concerned with establishing practices that are coherent in time with the physical dimensions of infrastructural sites. As a component of this strategy, I propose creating a planner of designer role responsible for advising the municipal authorities and guiding the series of interventions over time. The fourth strategy embraces the principles of 'plural urbanism' as defined by Ryan (2017), and in many ways is meant to reinforce and bring coherence to the application of the other three strategies. Finally, in a concluding chapter the project is summarized and future avenues for research are suggested.

#### RÉSUMÉ

L'infrastructure connaît une renaissance comme sujet d'étude et d'intervention dans beaucoup de champs universitaires et professionnels. Elle est simultanément vu comme un vecteur d'investissement public pour maintenir la qualité de vie et réagir aux crises écologiques mondiales. Tandis qu'à bien des égards cela marque un retour a de préoccupations urbanistiques historiques, les études actuelles se penchent toujours majoritairement sur les problématiques d'introduction de nouvelles infrastructures en milieu urbain ou leurs réutilisations lorsque désuètes. Beaucoup reste à étudier vis-à-vis l'amélioration de site infrastructurel lorsque la fonctionnalité originelle est maintenue. Cette présente étude examine deux cas semblables d'un type d'infrastructure linéaire régionale, des tunnels ferroviaires en zone urbaines établies, en ce qui concerne la qualité d'aménagement des espaces ouverts en surface. Trois objectifs principaux ont été identifiés: 1) passer en revue la littérature qui lie l'infrastructure avec l'urbanisme, le paysage et l'espace public/la vie public, 2) documenter les cas de la Jonction Nord-Midi à Bruxelles et du Tunnel Mont-Royal à Montréal et 3) fournir une analyse générative, avec pour but de d'établir des stratégies d'interventions généralisables. Je propose quatre stratégies qui répondent aux conditions existantes dans les sites d'infrastructure et qui font usages des concepts identifiés dans la revue de littérature. La première stratégie se concentre sur l'identification du site et l'établissement d'un cadre de planification de projet approprié. La deuxième stratégie vise à établir en priorité une expérience longitudinale du site en surface. La troisième stratégie suggère d'établir un processus dans le temps qui est cohérent avec les dimensions physiques d'un site infrastructurel. Comme un composant de cette stratégie, je propose de créer un rôle d'urbaniste ou de concepteur responsable pour conseiller les autorités municipales et guider les interventions au fil du temps. La quatrième stratégie embrasse les principes de 'l'urbanisme pluriel' comme défini par Ryan (2017) et à bien des égards vise à renforcer et apporter de la cohérence à l'application des trois autres stratégies. Finalement, dans un chapitre concluant le projet, je propose des possibilités pour de futures recherches.

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## 1 INTRODUCTION

It is an understatement to say that infrastructure is enjoying a renaissance as a subject of study and intervention in many academic and professional fields (Gandy, 2011). There is no single reason to which this can be attributed. First, indirectly, the ubiquitous rise in digital technologies and the physical systems on which they depend has, by extension, reaffirmed the dependence of social and economic life on all kinds of linear networked infrastructure. Secondly, concerns about the provision and efficiency of transport, water, and energy infrastructures have been foregrounded by ecological crises and a renewed interest in urban living. Lastly, the partial return of a Keynesian attitude towards public intervention in economies has been accompanied by an acknowledgement that infrastructure is a driver of development and a requirement for maintaining quality of life. As such, infrastructural projects are seen as an important vector for renewed public—and increasingly private—investment, particularly in North America and other G20 group nations (Dodson, 2017).

These concerns mark a return to historic urbanistic concerns with physical and functional systems on the part of the design professions (urban design, planning, architecture, landscape architecture), which dominated intervention in these fields during the 19<sup>th</sup> and early 20<sup>th</sup> centuries (De Block, 2016; Neuman & Smith, 2010). Whereas in those times the primary concern was with the *introduction* of infrastructural systems to cities (sewage, railroads, highways), contemporary study and interventions must grapple with the *pre-existing* presence of infrastructure in the urban landscape. While modernist and Fordist modes of infrastructure provision prized functionality in the design and organization of space, contemporary discourse has emphasized a need to return to integrated modes of design in which the urbanity of these spaces is considered on equal footing with functional requirements (Kullmann, 2011).

The sheer size and physical importance of certain urban infrastructures necessarily made them the key element around which space and built form were (re)organized. This spatiality of infrastructure—especially when it no longer serves its original purpose—has been one the focuses of academic and professional discourses such as landscape or ecological urbanism which have demonstrated a particular affinity for suggesting what is to be made (or remade) of residual infrastructure in post-Fordist, or even 'shrinking city,' contexts (Belanger, 2009; Desimini, 2014; Nijhuis & Jauslin, 2015; Waldheim, 2016). It is from this strand of thinking that have emerged prominent projects such as the High Line in New York, the Promenade Plantée in Paris, and many other projects which, in repurposing redundant infrastructure, have foregrounded the relationship between linear infrastructures and landscape (Nijhuis & Jauslin, 2015).

Less frequently or thoroughly addressed is what to make of the urban spaces that are still dominated by infrastructure whose functionality is maintained, or even improved. In these cases, both the historic advantages and disadvantages of infrastructures remains current. That is, infrastructures continue to provide the social connectivity and economic advantages lauded by some (Calhoun, 1992) but also remain causes of uneven development, urban fragmentation, and misuse of power (Graham & Marvin, 2001; Mcfarlane & Rutherford, 2008). Prominent laments are also associated with the kinds of urban development enabled by linear infrastructure—particularly automobile transportation infrastructure, but to some extent as well passenger rail infrastructure. These criticisms are neither new nor restricted to particular spheres of life. They are alter-

nately environmental (sprawl, energy-intensity, fragmentation) economic (costs, inefficiency) or social-aesthetic (homogeneous landscapes, social fragmentation, low amenities), reflecting the multiplicity of infrastructure's impacts (Schweitzer & Valenzuela, 2004; Van Bohemen, 1998; Windsor, 1979).

One of the customary methods for extracting the greatest amount of benefit while mitigating the negative impacts of linear urban infrastructure was, and remains, to bury or otherwise physically dissimulate it. Yet, even submerged underground infrastructures continue to have an indelible impact on urban form. This is particularly true of underground transportation infrastructure which, either in its inability to be compacted beyond a certain point or in its affordance of higher densities, continues to shape urban form (Kagner, 2013). The costs associated with integrating these infrastructures or reorganizing urban form around them are not trivial, but a more thorough conceptual approach should contribute to better economic, ecological, social, and aesthetic outcomes.

Other shifts in planning and societal thought have percolated down to the level of infrastructure, many as a result of the acceptance of several 'laments' into the mainstream. Proactive consideration for the environmental impact of human activities is one of the obvious ones, made ever more necessary by global climate change. Another is the importance of socially-responsive and community-oriented design practices, as is the need to combat inequalities that may be engendered by uneven infrastructure provision (Agyeman, 2013; Burdett, 2017). The scale at which urbanistic interventions are considered most appropriate (or efficacious) has also changed through both theoretical and political contestation. Finally, ecological critiques of infrastructure design and planning have emerged and have lead to a more complex and inclusive consideration of 'ecology' that recognizes both natural and human components (Brocki & Lister, 2014).

This study examines two similar instances of a type of regional linear infrastructure: underground heavy rail in established urban settings. However, this kind of infrastructure falls within a larger type of linear physical infrastructure to which comparable urbanistic interventions could be applied. There are three main characteristics that define this type of infrastructure. The first is that its function is to facilitate regional circulation. By extension, this implies three additional factors: minimum dimensions necessary for carrying flows of people, limited access/egress points, and grade separation from other infrastructures of transport flows. Secondly, the scale of the infrastructure is such that its construction involved major demolition and reshaping of the urban form (including, potentially, a protracted construction period). Finally, following from the previous characteristic, the scale of the infrastructure has meant that reconstructing the buildings and urban spaces above was drawn out over multiple decades, or may not even be completed yet.

This definition is usefully illustrated by the two cases that I will study in this project: the Jonction Nord-Midi in Brussels, Belgium and the Mount-Royal Tunnel (Canadian Northern Railway-CNoR-line) in Montréal, Québec. Both are rail lines that were built to connect the centre of the most important cities in their respective contexts to the national and international mainline rail networks in configurations that combine underground tunnels and elevated sections. The segment considered in the Brussels case is roughly 3.8 km long and in the Montréal case 2.5 km. The construction periods are also roughly analogous; demolitions for the Jonction Nord-Midi were underway by 1914 but the junction was not in operation until 1952. Meanwhile, the Mount-Royal Tunnel and the rest of the CNoR line through downtown Montréal were designed in 1910 and operational by 1916, but major components of the infrastructure, such as a permanent passenger terminal, were not completed until 1943. In both cases, construction above the lines took decades to complete, stretching into the 1980s. Compared to other underground rail networks, such as metro systems, neither the Brussels nor Montréal infrastructures feature frequent passenger stops (though admittedly Brussels has more than Montréal) despite both serving regional as well as intercity routes. This is why I say that they are infrastructures that have limited access/egress points, a characteristic that is also true of underground/trench urban highways such as the autoroute Ville-Marie in Montréal. The case from Brussels will be more referential, helping me develop the methods that will be applied to the case from Montréal.

Three objectives have guided this project: 1) to review the literature that links infrastructure to urbanism as well as relevant concepts that relate to these topics in North American and European landscape discourses and in public space/public life/public domain discourses, 2) to document in analytical and observational terms the cases of the Jonction Nord-Midi in Brussels and the Mount-Royal Tunnel in Montréal and 3) to provide a generative analysis that discusses the cases with relation to the concepts explored in (1), seeking to derive generalizable strategies for intervention on similar infrastructural conditions. In order to practically achieve this aim, I apply an approach that combines research for design and research by design. The next chapter consists of a review of the literature on infrastructure and urbanism, as well as brief reviews of two main preoccupations this project. The details of my methodology will be provided in chapter three. Chapters four and five will present the Brussels and Montréal cases analyses respectively, while chapter six contains the generative discussion and strategies. Finally, an assessment of the methods used, avenues for future research, and recommendations for planners conclude this project in chapter seven. Lists of works cited will be provided at the end of each chapter and at the end of the text.

#### WORKS CITED

- Bélanger, P. (2009). Landscape As Infrastructure. *Landscape Journal*, 28(1), 79–95. https://doi.org/10.3368/lj.28.1.79
- Brocki, M., & Lister, N.-M. (2014). Enhancing complexity: Ecological design for living landscapes. *Oz*, 36(Special Issue: Complexity), 38–43.
- Calhoun, C. (1992). The Infrastructure of Modernity : Indirect Social Relationships , Information Technology, and Social Integration. In H. Haferkamp & N. J. Smelser (Eds.), *Social Change and Modernity* (pp. 205–236). Berkely, CA: University of California Press. Retrieved from http://ark.cdlip.org/ark:/13030/ft6000078s/
- De Block, G. (2016). Ecological infrastructure in a critical-historical perspective: From engineering 'social' territory to encoding 'natural' topography. *Environment and Planning A*, 48(2), 367–390. https://doi.org/10.1177/0308518X15600719
- Desimini, J. (2014). From Planned Shrinkage to Formerly Urban: Staking Landscape Architecture's Claim in the Shrinking City Debate. *Landscape Journal*, 33(1).
- Dodson, J. (2017). The Global Infrastructure Turn and Urban Practice. Urban Policy and Research, 35(1), 87–92. https://doi.org/10.1080/08111146.2017.1284036
- Gandy, M. (2011). Landscape and Infrastructure in the Late-Modern Metropolis. In G. Bridge & S. Watson (Eds.), *The New Blackwell Companion to the City* (pp. 57–65). Chichester, West Sussex, UK: Blackwell Publishing Ltd. https://doi.org/10.1002/9781444395105.ch6
- Graham, S., & Marvin, S. (2001). Splintering Urbanism: Networked Infrastructures, Technological Mobilities, and the Urban Condition. London and New York: Routledge.
- Kagner, K. (2013). Contemporary Infrastructure: An Interview With Marcel Smets. *Scenario* 03: *Rethinking Infrastructure*. Retrieved from https://scenariojournal.com/article/contemporary-infrastructure-an-interview-with-marcel-smets/
- Kullmann, K. (2011). Thin parks/thick edges: Towards a linear park typology for (post)infrastructural sites. *Journal of Landscape Architecture*, 6(2), 70–81. https://doi.org/10.1080/18 626033.2011.9723456
- Mcfarlane, C., & Rutherford, J. (2008). Political infrastructures: Governing and experiencing the fabric of the city. *International Journal of Urban and Regional Research*, 32(2), 363–374. https://doi.org/10.1111/j.1468-2427.2008.00792.x
- Neuman, M., & Smith, S. (2010). City planning and infrastructure: Once and future partners. *Journal of Planning History*, 9(1), 21–42. https://doi.org/10.1177/1538513209355373
- Nijhuis, S., & Jauslin, D. (2015). Urban landscape infrastructures: Designing operative landscape structures for the built environment. *Research In Urbanism Series*, 3(1), 13–34. https://doi.org/10.7480/rius.3.874
- Schweitzer, L., & Valenzuela, A. (2004). Environmental injustice and transportation: The claims and the evidence. *Journal of Planning Literature*, *18*(4), 383–398. https://doi.org/10.1177/0885412204262958
- Van Bohemen, H. D. (1998). Habitat fragmentation, infrastructure and ecological engineering. *Ecological Engineering*, 11(1–4), 199–207. https://doi.org/10.1016/S0925-8574(98)00038-X
- Waldheim, C. (2016). Landscape as Urbanism: A General Theory. Princeton, NJ: Princeton University Press.
- Windsor, D. (1979). A Critique of The costs of sprawl. *Journal of the American Planning Association*, 45(3), 279–292. https://doi.org/10.1080/01944367908976967

# 2 LITERATURE REVIEW

#### INTRODUCTION

In contemporary academic and professional contexts, the (re)conception of infrastructure has been a feature of numerous discourses with roots in multiple fields. This literature review will focus on discourses that have emerged from those disciplines that participate in urban design. What urban design is and who participates in its processes is a contested topic. Therefore, without making it the main object of discussion, this review will begin by drawing from the literature to establish a working definition of urban design, then will look briefly at what it means to think *about* urban design as opposed to for urban design, before delving into the conceptual and design discourses related to infrastructure and urbanism that will be important frames of reference throughout this project. This will include a review of literature specific to the main theme of this project, infrastructure in urbanism, as well as with the preoccupations of landscape and public space/public life. Because one case is drawn from a European context and the other from a North American one, some emphasis will be placed on distinguishing between shared and distinct elements of discourse amongst thinkers and practitioners in these locales. Additionally, in the final section of this literature review I will look briefly at how infrastructure and urbanism have been discussed by Belgian scholars specifically.

#### WHAT IS URBAN DESIGN?

One of the enduring confusions about what 'urban design' means has been attributed to definitions that indiscriminately blend statements about what kind of an action urban design is and statements about what it tries to achieve (Lang, 2017, p. 1). This has else-where been stated as the difference between the domain of urban design and the qualities of urban design (Rowley, 1994). Part of the confusion is also surely attributable to the emergence of the term as an *ex-post-facto* definition of practices that had already been ongoing for at least decades prior to the common usage of 'urban design' as a phrase to describe them. It could even, loosely and anachronistically, be used to describe processes that have occurred in human societies since the very first human settlements were constructed (Childs, 2010). This retrospective definition of urban design has also had the unfortunate consequence of creating a genealogy that, in many respects, parallels or intersects those of architecture, urban planning, and landscape architecture. On the face of things this would not be problematic, except that the points of convergence and divergence between the genealogies of these disciplines are difficult to pin down.

#### THINKING FOR OR ABOUT URBAN DESIGN?

Biddulph (2012) provides a good springboard for discussing the dichotomy that exists within definitions of urban design in his problematization of thinking for or about urban design. In his definition, thinking for urban design 'refers to the body of knowledge, ideas, and practices which characterize the applied field' while thinking about urban design 'refers to the body of thinking which attempts to locate urban design activities within social theory' (Biddulph, 2012, pp. 4, 3). Those previously mentioned definitions of of urban design (including both what it is and what it should do) are problematic, according to this reading of the situation, because they make a statement that is both about and for urban design, without marking the distinction between the two. A related tension has also emerged between definitions of urban design that fix its realm of action too narrowly within the design professions (a case of too much emphasis on thinking for urban design) and those that define urban design broadly as a socio-political-economic activity that should be rooted within social sciences (a case of too much emphasis on thinking *about* urban design). One of the most notable proponents of this latter position has been Cuthbert (2006, 2007, 2010), who has taken a particularly strong stance against the formalism, self-referentiality, and lack of empiricism that he argues are common to many of the canonical thinkers and texts of urban design.

The case against common usage definitions of urban design is inevitably articulated by Cuthbert and others such as Verma (2011) as an epistemological failure (with often plentiful references to Thomas Kuhn or other philosophers of science). While many thinkers would be unwilling to go as far as Cuthbert, some such as Biddulph (2012), Lang (2017), and Ryan (2017) recognize the legitimacy of his argument for increased consideration of the social, political, and economic contexts within which urban design occurs. They are not, however, willing to categorize it as a social science separate from design practices; they do not want to forego thinking *for* urban design at the expense of better thinking *about* it.

#### INTERWOVEN HISTORIES OF URBANISMS

No matter what their specific position towards urban design—or definitions of it theorists by and large depend on retracing a history of thinkers, treatises, manifestos, movements, and case studies to do the bulk of their substantive epistemological work. This also necessarily involves an effort at establishing a system of classification. Most scholars adopt employ some sort of chronological approach. Some are reductive, in the sense that they give a simplified chronology that excludes works that disagree or contribute nothing to the theory that is being established. Examples include the illustrated chronology of formative texts presented in Gehl and Svarre (2013), which was noteworthy enough to have been reprinted in Ivers (2018). Others are more inclusive, recognizing all major references but organizing them according to a 'naïve' chronology in which thinkers are grouped in 'generations' simply on the basis of the period in which they produced their work. Birch (2011), for example, establishes five successive generations that she identifies as 'Precursors, Founders, Pioneers, Developers, and Later evolvers,' though she does additionally classify them according to disciplinary affiliation. Others, still, are inclined to organize their narratives according to movements or paradigms that have succeeded, competed, and overlapped with each other since the mid-to-late 19<sup>th</sup> century, for example Fishman (2011), Alex Krieger (2009), or Ryan (2017). The older or the more universally revered the thinker (e.g. Jane Jacobs, Camillo Sitte, Frederick Law Olmsted, or even, interestingly, Le Corbusier) the more likely they are to be claimed by proponents of different movements. Even Cuthbert, a critic of such self-referential theorising, relies upon his own canon of social scientists (e.g. Harvey) and participates in the liturgy of the urban design canon nonetheless when he feels the need to reference all those works and thinkers that are not sufficiently empirical—that is to say, according to him, almost all of them (Cuthbert, 2010).

All of this is mentioned because this project must inscribe itself within these trends for studying, classifying, and strategizing for urban design and urban planning. As the methods section will make clear, this project has a greater affinity with approaches that are for urban design and takes for granted some of what urban design is about. As far as synthesizing a definition of urban design, I will accept three components that commonly emerge, even in definitions that otherwise contradict each other. First, urban design is a collaborative process whose theorization and practice actively involves a wide range of professional and non-professional actors (Barnett, 2009; Birch, 2011; Cuthbert, 2010; Lang, 2017; Madanipour, 1997; Rowley, 1994). This is particularly true when infrastructure is involved. Secondly, as the name would suggest, it must contend with an object that is urban, whether in scale or in quality (Rowley, 1994; Ryan, 2017). Lastly, there is the notion that urban design has a responsibility towards the quality of the public realm or public spaces (Lang, 2017; Madanipour, 1997). Because this project has multi-disciplinary preoccupations and objects of study, I will simply refer henceforth to the field of action within which the design of infrastructure and adjacent buildings and spaces occurs as urbanism—which has the added virtue of being closer to the French term, *urbanisme*, that is in use in the case literature for both Montréal and Brussels.

#### **INFRASTRUCTURAL 'WAYS'**

What the term 'infrastructure' has come to refer to has broaden greatly since it was first used in French in the late 19<sup>th</sup> century to refer to the foundations and substructures that were below (infra-) other, aboveground structures. From this quite literal definition, the meaning of the word infrastructure has shifted to include all manner of objects, concepts, elements, etc. that are in some way figuratively 'support' or are foundational to the existence or functioning of another system. As was made clear in the introduction, my purposes here will be to consider a very narrow category of objects that have come to be considered infrastructure, namely networked, grade-separated transportation infrastructure.

In their contemporary form, this kind of transporation infrastructure is an evolution of a basic kind of networked infrastructure that has existed since ancient times to carry flows of people: roads or 'ways.' This may seem a banal fact to mention, but Éric Alonzo, in his immensely well-documented *L'Architecture de la voie* (2018)—which traces the history and theories of ways (in the sense of road*way*, high*way* or rail*way*) from Roman times to today—reminds us that the 'way' is the 'archetype of infrastructure' (Alonzo, 2018, p. 17, my translation). Indeed, Alonzo's use of the *way* is intentional to specifically avoid the overly-broad, and hence obfuscating, 'infrastructure' (Alonzo, 2018, p. 17). While it would suit my purposes well to use the same linguistic trick, 'way' in English does not benefit from the same level of common usage or familiarity as the French 'voie.'

There are a number of important arguments advanced by Alonzo in his book. The first is that while it may appear like a particularly modern preoccupation, the aesthetic, ecological, and functional design of infrastructure is engrained in practices whose 'centre of gravity' is much earlier in history than is generally acknowledged (Alonzo, 2018, p. 21). Secondly, Alonzo advances that ways, perhaps more so than any other object of design, are the result of collaborations between the disciplines of engineering, architecture, landscape architecture, and urbanism—even as they have been most closely associated with the discipline of civil engineering (Alonzo, 2018, pp. 15–16). Thirdly, he emphasizes the fundamental impact that the emergence of the first mechanised vehicles—trains had on the conception of transportation infrastructure. He reminds us that the impact of rail travel on the perception of time and landscape is analogous to that attributed to information technology today—and probably more so for having been the first such shift) (Alonzo, 2018, p. 258). But even more importantly, Alonzo recounts the 'radicality' of railways for the physical constraints that high-speed mechanized flows impose on the physical design of the infrastructure that enables them; abolishing of topography, sweeping turn curves, and the inability to integrate with antecedent networks—the intersection, at least at grade, becomes impossible unless the rail (and later automobile) flows are prioritized (Alonzo, 2018, p. 259). We have here the first original case of infrastructure (and technical progress) as obstacle, the basis for many of the laments associated with infrastructural spaces.

Finally, Alonzo proposes a set of three paradigms to order differences in the conceptualization and design of infrastructural ways. His intention is to counter what he claims is the accepted chronological ordering of shifts that, at least in a French context, could be summarized in three periods: a first from the beginning of time until the early 20<sup>th</sup> century, culminating in the achievements of Haussmann in accommodating non-motorized forms of transport in 19<sup>th</sup> century Paris; the second begins in the early 20<sup>th</sup> century with the dominance of the automobile; and the third is the period since the *Trentes Glorieuses* that has seen emerge a criticism of functionalism (Alonzo, 2018, p. 21). Alonzo instead proposes *l'édifié* (the built), *le jardin* (the garden), and *le flux* (the flow) as the three operative modes of thinking that have guided the 'conception ways.' These will be useful frames going forward.

#### INFRASTRUCTURE + URBANISM

Alonzo's text also provides a useful bridge into a review of the more specific literature that relates infrastructure to urbanism. By tracing a history of infrastructure as Alonzo does, we are reminded that urbanism has its origins not just in the composition of buildings but also of its streets and infrastructure. Indeed, the practitioner that first brought the term 'urbanism' to prevalence was Ildefons Cerdà—known for the *General Theory of Urbanization* (1867) and his plan for Barcelona's Eixample—a railroad engineer by training and profession (Alonzo, 2018, pp. 273–275). Cerdà's theories about the planning and design of cities were centred around a study of roads and transport flows. We owe his famous chamfered blocks, for example, to detailed graphic analysis of how best to manage intersecting traffic flows. His was an integrated approach to infrastructure and urbanism, one that went beyond a functionalist conception of roads and was:

'loyal to the secular architectural tradition of that couples a [...] "belowground" (subsuelo) with an "above-ground" (suprasuelo) that comprises: benches, bollards, trees, lampposts, etc. Research on the layout of traffic islands in intersections therefore structurally integrated the construction of kiosks and shelters destined to contain services useful to passersby: shops, public facilities and services, etc.' (Alonzo, 2018, p. 289, translation my own)

In many ways, recent discourses that have actively sought to jointly deal with infrastructure and urbanism a return to pre-functionalist integrated modes of design. There is once again an appetite for taking infrastructure as a starting point for the integral design and planning of spaces, including adjacent built forms and landscapes. This is precisely the central claim of *The Landscape of Contemporary Infrastructure* (2016) by Marcel Smets and Kelly Shannon. This is one of the most cited texts on infrastructure and urbanism and is of particular interest to this project for having been produced by writers working out of a Belgian university. We will circle back to the Belgian context as it would be unfair to Smets and Shannon (2016) not to first consider the broader geographic ambitions of their work. Their book consists of a reasoned catalogue of infrastructure projects from the last few decades across the world (though dominated by European and North American cases) accompanied by a series of short essays that introduce the volume and each of its sections.

One of Smets and Shannon's claims is that today as much as ever, infrastructure is an essential vector for action in urbanism as it remains one of the few physical interventions large enough in scale that receives attention and funding from governments (Smets & Shanon, 2016, p. 9). They further posit that 'conceiving infrastructure blends with generating architecture, building landscapes, and producing urban settings and living environments' and note that when it comes to the design of new infrastructure 'the urban designer or landscape architect is no longer simply there to beautify a project that is principally based on technical considerations, but is often a primary designer of infrastructure together with engineers' (Smets & Shanon, 2016, p. 9). Nevertheless, despite this claim the titles of many of their subsections suggest that much remediation work is still at play. I will note only the following few section titles: 'the artifice of hiding,' 'assimilation through camouflage,' 'fusion into a new composite,' 'staging the scenery,' and 'beautified leftover.' This lapsus is useful for my purposes, however, as both of the cases I will document involve interventions after the fact rather than documenting initial design intentions. A number of the cases they catalogue, or elements of them, may be useful inspirations or precedents for intervening in the Montréal case, as may be some of the general categories of strategies that they propose (as section titles).

Another prominent work allying infrastructure and urbanism is the semi-manifesto 'Infrastructural urbanism' by architect Stan Allen published as a chapter of his book Points + Lines: Diagrams and projects for the city (1999). In it he makes seven 'propositions' about the nature and role of infrastructure as a structuring and organizing element for architecture and urbanism (Allen, 1999, pp. 54–57). His notion of infrastructure implicitly refers to at least all roadways (as the inclusion of a movement diagram from Louis Kahn seems to indicate) or all dedicated spaces of flows. Allen (1999) is an important reference because of the influence of his text on one of the other main strands of literature that links infrastructure and landscape, the discourse of landscape *as* infrastructure that has mainly be put forward by Pierre Bélanger (Bélanger, 2009). This is not a discourse that is of particular interest for this project, but some of Bélanger's other work is, notably 'Underground landscape: The urbanism and infrastructure of Toronto's downtown pedestrian network' that compares Toronto's network to, amongst others, Montréal's equivalent system, which so happens to have major nodes within the Mount-Royal Tunnel infrastructural site. Bélanger and Allen are also both linked to the larger landscape urbanism discourse, which will be one of the design discourses reviewed later. Marcel Smets, meanwhile, will later provide a link to the specific Belgian context.

#### PUBLIC SPACE/PUBLIC LIFE

The public space/public life discourse finds its origins in the 1960s rejection of modernist functionalism, which had increasingly come to be perceived as incongruent with human needs and propensities (Fishman, 2011; Rvan, 2017). Unsurprisingly, to combat modernism's future-facing outlook critics looked to historical city form and urbanistic theory to support their arguments. To combat the technocentric outlook, critics focused on people themselves and social processes. These two focuses still form the main pillars of public space/public life discourse today. The public space/public life discourse manifest itself in two main veins of works: prescriptions as to what makes good public spaces (and urban form more generally) and empirical work that attempts to corroborate the sociological impacts of public spaces. The former category of work borrows much from environmental design, and one of the main concepts that emanates from it is the need to design spaces that are human-scaled and that cater to their interests. While some works fall squarely into one or the other vein, a majority of the seminal works in the public space/public life discourse feature some combination of the two, using empirical work to justify their prescriptions. Appleyard (1981), Bentley et al. (1985), Gehl (2011), Hall (1966), Jacobs (1961) Lynch (1960), Newman (1973), Whyte (1980) are all examples of this. It speaks to the reach of this discourse that such texts are often simply considered classics within the field of urban planning.

Recent contestations within the discourse have focused on socio-economic dimensions of public spaces as well as, increasingly, discussion of how property regimes affect the very meaning of what is understood by 'public domain.' Hajer and Reijndorp's *In Search of New Public Domain* (2001) analyses urban spaces in terms of their ability to serve as public domain—that is, in their terms, spaces of meeting, exchange and 'cultural mobility.' While they are critical of the prevalence of privatized, commercialized, or otherwise neo-liberalised 'non-places,' their strategies also propose moving beyond idealized historical typologies of urban spaces and to stop striving for the 'politically-correct view of public domains as [...] the Great Fraternization in the public space' (Hajer & Reijndorp, 2001, pp. 113–116). This position has gained traction in criticisms of neotraditional movements—epitomized by new urbanism—that were rooted in naïve interpretations of critiques of modernism. Carmona (2015) and Madanipour (2013) attack the fetishization of historical urban aesthetics for being nothing more than veneers of respectability that legitimize spaces of consumption.

In so far as infrastructure has often been accused of creating unattractive, left-over spaces (one of the premises of this project), it is important also to mention Trancik's seminal *Finding Lost Space* (1986) in which the titular 'lost space' defines all of those 'unstructured landscape[s]' that 'provide no positive contribution to the surroundings or users' (Trancik, 1986, pp. 3–4). Trancik draws on a mixture of works and theorists some historical (*e.g.* Sitte, Olmsted, Lynch) but also some of his post-war contemporaries (Bacon, Rossi, Van Eyck, McHarg) to establish his proposed 'integrated approach to urban design.' Notably, he advocates for Richard Sennett's 'uses of disorder.' This is an expression of a long-lasting sentiment amongst some public space/public life theorists against static (over-)programming of spaces. It was eloquently evoked by de Solà-Morales Rubio's *Terrain Vague* (1995) and has most recently been articulated by the concept of 'loose space' in a volume edited by Franck and Stevens (2007). This formulation of flexible use of public space has found traction in both justice-oriented work (Agyeman, 2013, pp. 101–105) as well as in more design-oriented work (Kullmann, 2014), as will be seen in the next section focusing on landscape preoccupations.

#### LANDSCAPE

By adopting 'landscape' as one of my major preoccupations for this project I am conscious that I am imposing a lot of conceptual baggage on a single word. Part of what I intend to consider when using landscape as a lens is to employ the word's naïve or banal definition, simply to refer to the ensemble of visible features within urban spaces-what is commonly understood when using the expression 'urban landscape,' essentially. This broader definition of landscape is, as Corner argues in Eidetic Operations and New Landscapes, separate from notions of 'environment' but is nonetheless inseparable from visual (or sensory) perceptions and the functional experience of spaces, which he locates as the interstice between the Old English Landskip and Old German Landschaft (Corner, 2014a, pp. 241–243). I also intend to use landscape to refer to particular modes of design thinking that are grounded (but not exclusive to) the landscape architecture profession. In particular, because of the European locale of one of my cases and the North American locale of the other, I want to explore general approaches and some specific concepts that have arisen in prominent landscape (architectural) discourses, or specific practitioners' corpus, on both these continents. One of the reasons for considering both is that while some concepts are shared, there remains, I would argue, significant differences between theory and practice despite the increasingly globalized nature of design practices. For the North American context, I will look mostly at the discourse of landscape urbanism while in a briefer tour of European thinking I will mostly focus on a few theorists/practitioners that actually have ties to landscape urbanism to emphasize some of the differences. In both cases I will, of course, focus on how these broader discourses relate to infrastructure and the public realm.

#### LANDSCAPE URBANISM

In the North American context, landscape urbanism has been one of the most notable discourses in within the design professions since it emerged in the late 1990s. Landscape urbanism continues the trend, as we saw earlier with urban design, of fields of action and approaches that are ambiguously defined, which is why it is better described—as I have been doing—as a discourse. As with many academic discourses the main thrusts of landscape urbanism can be gleaned from its most influential constituent texts and from the study of a select number of projects either explicitly developed in a landscape urbanist approach or that have been retroactively claimed by its proponents. Undoubtedly its most influential theorist has been Charles Waldheim at the Harvard Graduate School and its most prominent practitioner (and an important theorist) has been James Corner and his Field Operations firm, while others sometimes also included Mohsen Mostafavi, also at the Harvard GSD, and Richard Weller, at the University of Pennsylvania (Thompson, 2012; Vicenzotti, 2017). The major texts include Corner's Recovering Landscape (1999), Landscape Urbanism: A Manual for Machinic Landscape (2003) edited By Mostafavi and Najle, the Waldheim-edited Landscape Urbanism Reader (2006), The Landscape Imagination: Collected Essays of James Corner 1990-2010 (2014), and the 'definitive' statement on the matter, Landscape as Urbanism: A General Theory (2016), again by Waldheim.

#### LANDSCAPE URBANISM + INFRASTRUCTURE

Landscape urbanism has a fluid, if close, relationship with the notion of infrastructure. We have already mentioned the emphasis placed on treating landscape as infrastructure that is most apparent in Bélanger's work, but other works draw on infrastructure as an important inspiration for how to treat (engineer) landscapes, such as the *Mesh book: landscape/infrastructure* by Raxworthy and Blood (2006). An ecological turn, in which the systematic complexity of infrastructure has been assimilated to ecological processes

has been explored in tomes such as Mostafavi and Doherty (2016) or the collection edited by Reed and Lister (2014). Part of the closeness between landscape urbanist discourses and infrastructure has to do with the looseness of what is understood by 'infrastructure.' Corner goes so far as to include 'infrastructures' as one of the five essential elements to a landscape urbanist practice, except that he uses infrastructure as a general category for the kinds of actions that are involved in landscape design or construction, such as 'earthwork grading, drainage, soil cultivation, vegetation establishment techniques, land management' (Corner, 2014b, p. 293)

One of the reasons that infrastructure is being claimed so strongly by landscape urbanists is, in part, because one of the goals of this movement from its beginnings has been about asserting the disciplinary value of landscape architecture. As such, by describing infrastructure, especially transportation infrastructures, as 'part structure and part earthwork' it is possible for them to argue that it represents a 'formal position between architecture and landscape' (Tatom, 2006, p. 181). Another reason for infrastructure's prominence in landscape urbanism discourse is because it represents one of the movement's most fertile fields of practice. Many prominent landscape urbanist thinkers, not least of which Waldheim, have made the case that a landscape-as-medium approach to urban intervention could only have emerged within post-Fordist economies, of which redundant infrastructural space is a key feature (Waldheim, 2016, pp. 69–70). As such, these spaces present an opportunity to be reconstructed as landscapes with ecological functions, but also as open spaces to be claimed by the public Robinson (2013). Some examples of built projects that follow from this line of reasoning were mentioned in chapter one, but also include the work of prominent firms such as Reed's Stoss Landscape Urbanism, Weiss/Manfredi (presented in Weiss & Manfredi, Public Natures: Evolutionary Infrastructures, 2015) or SWA (presented in Landscape Infrastructure: Case Studies by SWA, 2013), amongst many others.

#### CONCEPTS FROM LANDSCAPE URBANISM

One of the central claims of landscape urbanism is that landscape is the most appropriate object of urban design and, simultaneously, the medium through which cities should be (re)organized. Vicenzotti (2017) argues that landscape urbanist theorists can only do this by attributing multiple definitions to 'landscape' (as I myself am doing, in using landscape as a preoccupation) without necessarily being explicit in their multiple conceptualizations of the term. The shift from one definition to another is often implicit but becomes visible when landscape urbanists make attempts to describe characteristics of the different definitions of landscape. Three of these can be, I think, coherently articulated into operationalizable concepts: horizontality, ground, field, or surface; layering or thickening; process.

#### EUROPEAN LANDSCAPE

In this short section I intend to highlight some landscape concepts that are more common to European design cultures whereas landscape urbanism, as we have seen, has stronger roots in North America. I do not mean to suggest that either is hermitic to the other (nor that no other landscape discourses exist in North America, for that matter). Indeed, landscape urbanists have endeavored to incorporate European precedents and theorists into their discourse. But it is also true that these have been, at worst, *a posteriori* attempts at creating a genealogy of landscape urbanistic practices before it was theorized at such or, at best, an acknowledgement of influences. The works and writings of Rem Koolhaas or Bernard Tschumi fall into this category. Adriaan Geuze is probably the exception to a European practitioner identifying as a landscape urbanist (Heins, 2015). As well, one of the most influential landscape urbanist texts, the previously mentioned *Landscape Urbanism Reader* (2006), included a number of essays that treated European precedents and also included an essay by Shanon on "Landscape Urbanism in Europe," but nonetheless, most acknowledge that landscape urbanism is sufficiently distant from the (continental) European discourses in landscape to leave some of its theorists and practitioners perplexed (Thompson, 2012; Vicenzotti, 2017). The European context is also different for being subject to an important formal framework about landscape, the European Landscape Convention of 2000. This framework defines landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Olwig, 2007, pp. 580–581). The objectives of the framework are to protect the quality of life of residents through a recognition of the cultural and natural values of landscape (Déjeant-Pons, 2006).

In terms of design-thinking, the main distinction I want to draw between North American and European landscape discourses is the latter's roots in intellectual movements that blended modernism and historical practices. In France, this manifested itself in a continuum of gardening and horticultural practices often linked to the École Nationale Supérieure de Paysage (ENSP) Versailles (Corajoud, 2003; Raxworthy, 2018, p. 9), in the Netherlands this has been described as a tradition of craftsmanship in landscape architecture (Heyde, 2018), and in Germany as an 'organicist' conception of landscape planning that is tied to early 20<sup>th</sup> century theories and practices (Haney, 2010; Sohn, 2007). It is worth pointing out that while it has had less prominence than landscape urbanism, Raxworthy (2018) suggests a similar discourse embedded in gardening practices has been present in the United States as well, in the works of scholars such as Elizabeth K. Meyer, Marc Treib, and Dorothée Imbert. Some of the earliest contemporary projects integrating infrastructure, landscape, and public space to have influence across Europe are the massive works carried out for the Barcelona Olympics in 1992, of which Manuel de Solà Morales's work is notable (and presented in his monograph A Matter of Thinas. Solà-Morales, 2008). French projects from the late 1980s and early 1990s, such as the integration of the TGV Méditérrannée and its station (Desvigne, 2008), the new tramway lines in the Parisian periphery (Smets & Shanon, 2016), or projects such as Corajoud's Jardins Wilson constructed over the M1 motorway, are equally notable (Corajoud, 1999; Smets, 2001). Most specifically, form the European discourses I will be drawing on the concept of 'intermediary natures' amongst other strategies developed by Michel Desvigne in his practice and writings including on the TVG Médiérannée and Plateau de Saclay (Desvigne, 2008; Desvigne & Imbert, 2018). The next section, in which I review scholarly work from Belgium specifically, will further demonstrate a European 'sensibility' to landscape, infrastructure, and urbanism that is more historically-informed than landscape urbanist discourses.

## INFRASTRUCTURE, LANDSCAPE + INFRASTRUCTURE IN BELGIUM

In this last section of the literature review, I would like to briefly turn to scholarly work that has emerged in Belgium regarding infrastructure and urbanism. It was only after having selected the Brussels case and having begun research on infrastructure and urbanism broadly that I realized there, coincidentally, appeared to have been a more concerted effort to theorize infrastructure, urbanism, and landscape in a Belgian context. Much of this work has focused on trying to explain patterns of urbanization in Belgium through a historical understanding of the development of infrastructure and of the prevailing philosophies applied by planners and designers.

Of particular note are a series of recent doctoral projects. In his PhD research, republished as From Flux to Frame: Designing infrastructure and shaping urbanization in Belgium (2014), Van Acker documents three cases in Belgium where urbanization was shaped by successive infrastructure projects (and also contains a review of infrastructure and urbanism broader than I was able to include). Amongst other conclusions, he places emphasis on the 'parallel histories' of urbanization and infrastructure, and projects that recognition of infrastructural landscapes' as 'latent coherent landscape structures' (a concept that could be assimilated to Rossi's 'urban artefact' or the concept of 'structures of permanence') could allow more sensitive, but ambitious, interventions on infrastructural sites (Van Acker, 2014, p. 423). In an offshoot paper that focuses on just the case of the Antwerp 'Ringscape,' he has even advanced infrastructure as a mode of urban design (Van Acker, 2010). A similar case, of 'infrastructure as mode of urbanism,' is advanced in the research of De Block, though with an emphasis on the role of transport infrastructure at a larger (national) scale, as well as on the role played by design ideologies of the 19<sup>th</sup> and 20th centuries (De Block, 2012; De Block & De Meulder, 2011; Vanoutrive, Van Damme, & De Block, 2016). The doctoral research of Ryckewaert, meanwhile, focuses specifically on the economic affordances of infrastructural projects and the impact of functionalist modes of planning and design in underpinning the Belgian welfare state in the mid-20<sup>th</sup> century. This research was republished as Building the Economic Backbone of the Belgian Welfare State: Infrastructure, Planning and Architecture 1945-1973 (2011).

Some of these scholars, joined by other colleagues, have also produced research that historicizes environmental and ecological modes of design and planning, with special attention to infrastructure. Danneels (2018) contrasts the apparent novelty of contemporary framings of 'metropolitan landscapes' in the Brussels context by tracing the history of ecologically-inclined urbanism in the work of Paul Duvigneaud. The work of another Belgian infrastructure and landscape 'pioneer,' René Péchère-two of whose major garden designs are located within the site of the Brussels study—is explored in Danneels, Notteboom, and De Block (2017). They note Péchère's influence on mid-20<sup>th</sup> century highway plans, especially the importance he placed on aesthetic and ecological integration of roadways into landscape. In De Block (2016), an important parallel is drawn between contemporary parametric, ecologically-minded design approaches and those interdisciplinary, reform-minded, hygienist, socially-oriented engineering and urbanistic approaches of the 19<sup>th</sup> century in Europe (particularly those of French engineers). Finally, Shannon and De Meulder have produced multiple volumes on the relationship between urbanism and water infrastructure, not limited to a Belgian context, including Water Urbanisms (2008) and Water Urbanisms East (2013).

#### WORKS CITED

- Agyeman, J. (2013). Introducing Just Sustainabilities: Policy, Planning, and Practice. London: Zed Books.
- Allen, S. (1999). *Points + lines: diagrams and projects for the city* (1st ed.). New York: Princeton Architectural Press.
- Alonzo, É. (2018). L'Architecture de la voie: Histoire et théories. Marseille: Éditions Parenthèses.
- Appleyard, D. (1981). Liveable Streets. Berkeley, California: University of California Press.
- Barnett, J. (2009). The Way We Were, the Way We Are: The Theory and Practice of Designing Cities since 1956. In A. Krieger & W. S. Saunders (Eds.), Urban Design (pp. 101–109). Minneapolis, MN: University of Minnesota Press.
- Bélanger, P. (2009). Landscape As Infrastructure. *Landscape Journal*, 28(1), 79–95. https://doi.org/10.3368/lj.28.1.79
- Bélanger, P. (2007). Underground landscape: The urbanism and infrastructure of Toronto's downtown pedestrian network. *Tunnelling and Underground Space Technology*, 22(3), 272–292. https://doi.org/10.1016/j.tust.2006.07.005
- Bentley, I., Alcock, A., McGlynn, S., Murrain, P., & Smith, G. (1985). *Responsive Environments: A Manual for Designers*. Oxford: Architectural Press.
- Biddulph, M. (2012). The Problem with Thinking about or for Urban Design. *Journal of Urban Design*, *17*(1), 1–20. https://doi.org/10.1080/13574809.2011.646251
- Birch, E. L. (2011). From CIAM to CNU. In T. Banerjee & A. Loukaitou-Sideris (Eds.), *Companion to Urban Design* (pp. 9–29). Milton Park, Abingdon, Oxon: Routledge.
- Carmona, M. (2015). Re-theorising contemporary public space: a new narrative and a new normative. *Journal of Urbanism*, 8(4), 373–405. https://doi.org/10.1080/17549175.2014.909518
- Cerdà, I. (2018). *General theory of urbanization, 1867.* (V. Guallart, Ed.). Barcelona: IAAC Institute for Advanced Architecture of Catalonia; ACTAR Publishers.
- Childs, M. C. (2010). A spectrum of urban design roles. *Journal of Urban Design*, 15(1), 1–19. https://doi.org/10.1080/13574800903429357
- Corajoud, M. (1999). Jardins Wilson. AA FIles, 38(38), 3–9.
- Corajoud, M. (2003). Michel Corajoud. Studies in the History of Gardens & Designed Landscapes, 23(2), 130–140. https://doi.org/10.1080/14601176.2003.10435288
- Corner, J. (Ed.). (1999). *Recovering Landscape: Essays in Contemporary Landscape Architecture*. New York: Princeton Architectural Press.
- Corner, J. (2014a). Eidetic Operations and the New Landscape. In J. Corner & A. B. Hirsch (Eds.), *The Landscape Imagination: Collected Essays of James Corner 1990-2010* (pp. 241–255). New York: Princeton Architectural Press.
- Corner, J. (2014b). Landscape Urbanism. In J. Corner & A. Hirsch (Eds.), *The Landscape Imagination: Collected Essays of James Corner 1990-2010* (pp. 291–298). New York: Princeton Architectural Press.
- Corner, J., & Hirsch, A. B. (Eds.). (2014). *The Landscape Imagination: Collected Essays of James Corner 1990-2010*. New York: Princeton Architectural Press.
- Cuthbert, A. R. (2006). Theory. In *The Form of Cities: Political Economy and Urban Design* (pp. 9–21). Oxford: Blackwell Publishing Ltd.
- Cuthbert, A. R. (2007). Urban design: Requiem for an era Review and critique of the last 50 years. *Urban Design International*, 12(4), 177–223. https://doi.org/10.1057/palgrave. udi.9000200
- Cuthbert, A. R. (2010). Whose Urban Design? *Journal of Urban Design*, 15(3), 443–448. https://doi.org/10.1080/13574809.2010.487816

- Danneels, K. (2018). Historicizing Ecological Urbanism: Paul Duvigneaud, the Brussels Agglomeration and the influence of ecology on urbanism (1970-2016). On Reproduction. Re-Imagining the Political Ecology of Urbanism. Urbanism & Urbanization Conference Proceedings., (April), 343–356.
- Danneels, K., Notteboom, B., & De Block, G. (2017). The Garden Territory: René Pechère, the Service of the Green Plan and the influence of the German Autobahn on the Belgian Highway Project. *Creation/Reaction. ECLAS Conference* 2017. *Proceedings*, (January), 389–406.
- De Block, G. (2012). Designing the Nation: The Belgian Railway Project, 1830–1837. *Technology and Culture*, *5*2(4), 703–732. https://doi.org/10.1353/tech.2011.0145
- De Block, G. (2016). Ecological infrastructure in a critical-historical perspective: From engineering 'social' territory to encoding 'natural' topography. *Environment and Planning A*, 48(2), 367–390. https://doi.org/10.1177/0308518X15600719
- De Block, G., & De Meulder, B. (2011). Iterative Modernism: The Design Mode of Interwar Engineering in Belgium. *Transfers*, 1(1), 97–126. https://doi.org/10.3167/trans.2011.010106
- De Meulder, B., & Shannon, K. (2013). Water Urbanisms East. Zurich: Park Books.
- de Solà-Morales Rubio, I. (1995). Terrain Vague. In C. Davidson (Ed.), *Anyplace* (pp. 118–123). Cambridge, Massachusetts: The MIT Press.
- Déjeant-Pons, M. (2006). The European landscape convention. *Landscape Research*, *31*(4), 363–384. https://doi.org/10.1080/01426390601004343
- Desvigne, M. (2008). Intermediate Natures: The Landscapes of Michel Desvigne. Basel, Switzerland: Birkhäuser.
- Desvigne, M., & Imbert, D. (2018). *A landscape inventory: Michel Desvigne Paysagiste* (First edit). San Francisco; Colombus, OH: Applied Research and Design Publishing; Knowlton School, The Ohio State University.
- Fishman, R. (2011). The open and the enclosed: shifting paradigms in modern urban design. In A. Loukaitou-Sideris & T. Banerjee (Eds.), *Companion to Urban Design* (pp. 30–40). Milton Park, Abingdon, Oxon: Routledge.
- Franck, K. A., & Stevens, Q. (2007). *Loose Space: Possibility and Diversity in Urban Life*. London: Routledge. Retrieved from https://proxy.library.mcgill.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=172203&scope=site
- Gehl, J. (2011). Life between buildings: using public space. Washington, D.C.: Island Press.
- Gehl, J., & Svarre, B. (2013). How to study public life. Washington, D.C.: Island Press.
- Hajer, M., & Reijndorp, A. (2001). *In Search of New Public Domain: Analysis and Strategy*. Rotterdam: NAi Publishers.
- Hall, E. T. (1966). The Hidden Dimension. New York: Doubleday.
- Haney, D. (2010). When Modern Was Green: Life and Work of Landscape Architect Leberecht Migge. Milton Park, Abingdon, Oxon: Routledge. Retrieved from http://books.google.com/ books?id=gKIwQAAACAAJ&pgis=1
- Heins, M. (2015). Finding Common Ground Between New Urbanism and Landscape Urbanism. *Journal of Urban Design*, 20(3), 293–302. https://doi.org/10.1080/13574809.2015.1031002
- Heyde, S. (2018). The Dutch tradition of modernist landscape architecture and the legacy of Hans Warnau (1922–1995). *Studies in the History of Gardens and Designed Landscapes*, 38(1), 57–72. https://doi.org/10.1080/14601176.2017.1351790
- Hung, Y.-Y., & Aquino, G. (Eds.). (2013). *Landscape Infrastructure: Case Studies by SWA, Second and Revised edition*. Basel, Switzerland: Birkhäuser.
- Ivers, B. C. (Ed.). (2018). Staging Urban Landscapes: The Activation and Curation of Flexible Public Spaces. Basel: Birkhäuser.
- Jacobs, J. (1961). The Death and Life of Great American Cities (2011). New York: Modern Library.
- Krieger, A. (2009). Where and How Does Urban Design Happen? In A. Krieger & W. S. Saunders (Eds.), *Urban Design* (pp. 113–130). Minneapolis, MN: University of Minnesota Press.
- Kullmann, K. (2014). The usefulness of uselessness: Towards a landscape framework for un-ac-

tivated urban public space. *Architectural Theory Review*, 19(2), 154–173. https://doi.org/10.1 080/13264826.2014.967330

Lang, J. (2017). Urban Design: A Typology of Procedures and Products (2nd ed.). New York: Routledge.

Lynch, K. (1960). The Image of the City. Cambridge, Massachusetts: The MIT Press.

- Madanipour, A. (1997). Ambiguities of urban design. *Town Planning Review*, 68(3), 363. https://doi.org/10.3828/tpr.68.3.2365658h658v0157
- Madanipour, A. (2013). Whose public space? In A. Madanipour (Ed.), *Whose Public Space?: International Case Studies in Urban Design and Development.* Milton Park, Abingdon, Oxon: Routledge.
- Mostafavi, M., & Doherty, G. (Eds.). (2016). *Ecological Urbanism* (4th ed.). Zürich, Switzerland: Lars Müller Publishers.
- Mostafavi, M., & Najle, C. (Eds.). (2003). Landscape Urbanism: A Manual for the Machinic Landscape. London: AA Publications.
- Newman, O. (1973). Defensible Space: Crime Prevention Through Urban Design. New York: Collier Books.
- Olwig, K. R. (2007). The practice of landscape "conventions" and the just landscape: The case of the European Landscape Convention. *Landscape Research*, 32(5), 579–594. https://doi.org/10.1080/01426390701552738
- Raxworthy, J. (2018). *Overgrown: practices between landscape architecture & gardening.* Cambridge, Massachusetts: The MIT Press.
- Raxworthy, J., & Blood, J. (2006). *The MESH book: landscape/infrastructure*. Melbourne: RMIT University Press.
- Reed, C., & Lister, N.-M. (Eds.). (2014). *Projective Ecologies*. Cambridge; Barcelona: Havard Graduate School of Design; Actar Publishers.
- Robinson, A. (2013). Modulating Infrastructural Flows to Create Open Space. In Y.-Y. Hung & G. Aquino (Eds.), *Landscape Infrastructure: Case Studies by SWA, Second and Revised Edition* (pp. 36–41). Basel, Switzerland: Birkhäuser.
- Rowley, A. (1994). Definitions of Urban Design: The nature and concerns of urban design. *Planning Practice & Research*, 9(3), 179–197. https://doi.org/10.1080/02697459408722929
- Ryan, B. D. (2017). *The Largest Art: A Measured Manifesto for a Plural Urbanism*. Cambridge, Massachusetts: The MIT Press.
- Ryckewaert, M. (2011). Building the Economic Backbone of the Belgian Welfare State: Infrastructure, Planning and Architecture 1945-1973. Rotterdam: Uitgeverij 010.
- Shannon, K., & De Meulder, B. (2008). Water Urbanisms. Amsterdam: SUN.
- Shanon, K. (2006). From Theory to Resistance: Landscape Urbanism in Europe. In C. Waldheim (Ed.), *The Landscape Urbanism Reader* (pp. 142–161). New York: Princeton Architectural Press.
- Smets, M. (2001). The contemporary landscape of Europe's infrastructures. *Lotus International*, 110, 116–125.
- Smets, M., & Shanon, K. (2016). *The Landscape of Contemporary Infrastructure*. Rotterdam: naio10 Publishers.
- Sohn, E. (2007). Organicist concepts of city landscape in German planning after the second World War. *Landscape Research*, 32(4), 499–523. https://doi. org/10.1080/01426390701449885
- Solà-Morales, M. de. (2008). A Matter of Things. Rotterdam: NAi Publishers.
- Tatom, J. (2006). Urban Highways and the Reluctant Public Realm. In C. Waldheim (Ed.), *The Landscape Urbanism Reader* (pp. 180–195). New York: Princeton Architectural Press.
- Thompson, I. H. (2012). Ten Tenets and Six Questions for Landscape Urbanism. *Landscape Research*, 37(1), 7–26. https://doi.org/10.1080/01426397.2011.632081

Trancik, R. (1986). Finding Lost Space. New York: Van Nostrand Reinhold Company Inc.

- Van Acker, M. (2010). Re-tracing urban design: Infrastructure as a mode of urban design. In *Urban Design Research: Method and Application*.
- Van Acker, M. (2014). From Flux to Frame: Designing Infrastructure and Shaping Urbanization in Belgium. Leuven: Leuven University Press.
- Vanoutrive, T., Van Damme, I., & De Block, G. (2016). On the Rationality of Network Development: the case of the Belgian Motorway Network. *International Planning History Society Proceedings*, 17th IPHS Conference, History-Urbanism-Resilience, TU Delft 17-21 July 2016, 03, 235–246.
- Verma, N. (2011). Urban Design: An incompletely theorized project. In A. Loukaitou-Sideris & T. Banerjee (Eds.), *Companion to Urban Design* (pp. 57–69). Milton Park, Abingdon, Oxon: Routledge.
- Vicenzotti, V. (2017). The Landscape of Landscape Urbanism. *Landscape Journal*, *36*(1), 75–86. https://doi.org/10.3368/lj.36.1.75
- Waldheim, C. (Ed.). (2006). *The Landscape Urbanism Reader*. New York: Princeton Architectural Press.
- Waldheim, C. (2016). Landscape as Urbanism: A General Theory. Princeton, NJ: Princeton University Press.
- Weiss, M., & Manfredi, M. A. (2015). *Public Natures: Evolutionary Infrastructures*. New York: Princeton Architectural Press.
- Whyte, W. H. (1980). *The social life of small urban spaces*. Washington, D.C.: Conservation Foundation.

## 3 METHODS

My methodology for this project mixes a number of techniques. The review of literature and of certain concepts in the previous chapter was one of the components, to ground any analysis within existing discourses and to provide me with a better sense of what has been previously said about infrastructure and urbanism. In this chapter I will describe the other components of my approach, making references to texts that helped me shape my approach as appropriate. In the previous chapter I also included a discussion of the notions of thinking for or about urban design. I will first continue in a similar vein, explaining in what ways I view my approach as being a mixture of research methods for and about design. I will then look, in turn, at some of the more specific methods I employed, namely the use case studies, of walking and 'urban traverses' as an experiential research method, photographing and documenting, and mapping. Finally, I will explain my approach to representing the open spaces in the catalogue contained in each of the case study chapters (four and five) as well as lay out the function and form typologies that I used to classify them.

#### RESEARCH FOR AND BY DESIGN

In an essay aptly titled 'The Uneasy Relationship between Design and Design Research' Bonsiepe (2007) discusses the tensions between the designer's instincts, which will tend to see the world 'with an eye to designability,' and the needs for scientific rigour. I have already made it clear that my approach will tend towards design-oriented research whether that is by or for design. Lenzholzer, Duchhart, and Koh (2013) provides a discussion of the validity and applicability of different epistemological models to 'research through design' in landscape architecture. They define four models with relation to, amongst other things, the kinds of research questions addressed and methods used. As far as my project is concerned. I would identify most strongly with the pragmatist model in which methods and approaches are combined from the other three models (post-positivist, constructivist, advocacy/participatory). As the subsequent sections of this chapter will make clear, I will use mostly a constructivist approach to my research method that, as Lenzholzer et. al put it, investigates 'concerns regarding the socio-cultural context of design concepts or design proposals such as reactions and shifts in thinking amongst people about concepts [...], esthetic evaluations of designs [that] can be studied by the designer with qualitative techniques from the social sciences such as observations.' At the same time. I will attempt to include some minor quantitative elements and be as purposeful in my approach as possible. In assessing the concepts introduced in chapter two and generating strategies (a design objective) I favour the approach 'not rigor, but vigor' (Leavy, quoted in Lenzholzer et al., 2013, p. 123)

#### CASE STUDIES

Case studies are a frequent feature of design and planning research. For example, writing about the use of case studies in landscape architecture research. Swaffield (2017) points out that case studies were used in 78% of the published peer-reviewed articles in Landscape Research. Case studies have an illustrious history in urbanism, whether for research purposes, the construction of theory, or for use as precedents to orient practice. I could cite, non-exhaustively, foundational texts such Sitte (1996), Jacobs (1961), Whyte (1980), Gehl (2011) that are heavily reliant on case studies to support, illustrate, or advance their claims. Similarly, I was inspired to include a catalogue of open spaces as part of both my cases based on the prevalence this cataloguing of cases in design publishing, something no doubt inspired by the catalogue raisonné of the art world. The catalogue of case studies is the basic format of some of the texts that were reviewed in the previous chapter such as Smets and Shanon (2016), Hung and Aquino (2013), Ivers (2018), or North (2012). As an introduction to both open space catalogues I make an attempt to explain my selection process for the spaces studied. Considering how commonplace the case study is, I therefore feel little need to further justify their presence in my methodological approach. I acknowledge, though, the limitations in generalizability associated with the use of case studies as well as the 'purposive' bias by which I have selected the Brussels and Montréal cases because I had a pre-expectation that they would be useful for the ideas I wanted to explore (Swaffield, 2017).

#### WALKING AND URBAN TRAVERSES

The basis for a majority of my observations in both of the cases I study in this project are first hand experiences of the sites. This was in part out of acknowledgement that there few better ways to gleam the characteristics of places and also to be able to add an element of improvisation, exploration, or experimentation to how I could have sensorial experience of the sites. Schultz & Etteger (2017) provide a good survey of the conceptual and theoretical underpinnings of walking as a research method (in the specific context of landscape architecture research) including its importance to notable case studies. I employed both the modes of 'engaging with the landscape' that they analyse, with my first site visits tending to use the 'wandering-method' they describe, while in latter visits I planned my routes more intentionally, akin to the 'continuous/stop-motion walking' mode they also describe. I was also inspired by some of the precepts put forward by Clay (2003) for what makes up a good 'urban cross-section' or 'urban traverse.' Though I read this piece after having begun visiting the first case study site in Brussels, I realized that I had been intuitively applying some of these 'rules' and kept them more explicitly in mind from then on. The following four 'rules,' which I quote directly from Clay (2003). I find to be evocative of the approach I took to walking the sites of my case studies:

'3. When the route gets boring or repetitive, turn off. To turn is to learn. Often the hidden spaces just off the main routes tell a different story.'

'4. The route must deal with the city centre, whether the historic centre, the civic centre, or geographic centre'

'13. At some point, the cross section should provide an overlooking view of the city, preferably from a high point.'

'15. Periodically, come back and run the section again to watch the city.'

#### PHOTOGRAPHING + DOCUMENTING

As I have explained, my earlier visits to the case study sites were more exploratory, but as I became more thorough in visiting all the spaces that compose the sites, I also took with me a digital single-lens reflex camera (DSLR) with me to document the sites. Use of the camera also helped systematize my observations as I sought to document similar characteristics of each space. Representation and the use of optical devices to frame scenery of course also have a long history in landscape. With regards to the value of photographing as a method, I defer to two pieces by Krieger (2004, 2011) in describing and justifying the use of photography to document in planning practice and education. He notably points out that photography and mass urbanization arose in the same time period and have therefore unsurprisingly intertwined histories. For example, Haussmann famously commissioned a photographer to document Paris before he ever began his massive urban renewal works. He also points out that 'Planners are well suited to systematically document our cities in photographs since planners have systemic interests' (Krieger, 2004, p. 213).

In establishing my approach to documenting the sites, I also decided to elaborate the final format and layout of the site analysis and open space catalogue sections of the case before I actually wrote my observations down. I also produced the graphic materials (on which more in the next sections) before writing. In doing this, I was hoping, once again, to be more systematic in my approach and to force myself to be meticulous in my selection of visual evidence. It also forced me to return to certain spaces in order that I might collect the necessary evidence. Krieger, stating a lesson from studying Diderot's attempts at describing artisanship, describes something alike what I am alluding thusly: 'The very act of documentation forced the artisans to articulate the importance of, or to re-examine, a particular act in the creation of an artifact (e.g. a piece of woodwork) – midwifery of the mind' (Krieger, 2011, p. 240). Another lesson from the same analysis also speaks to what I was attempting to do in my case studies: 'a single image or a description of one facet of a craft is insufficient. The historian attempts to put together a story, using multiple images, and it is that story that triggers re-examination of the artisan's craft' (Krieger, 2011, p. 240).

#### MAPPING

The majority of my graphic content is some sort of variation on a cartographic representation. Mapping is of course an important component of planning and design exercises. In its purely cartographic form, mapping is used more as the basis for analysis, translating the features of human and physical geography of a location into a technically accurate reference document. In its plan form, mapping serves a projective purpose, communicating the intention of the planner or the designer as it is expressed spatially. Desimini and Waldheim (2016) gives a relatively expansive overview of the features and use of cartography in the design disciplines, and some of the examples of maps contained within the volume (from a wide-range of authors, epochs, and locales) also provided some inspiration for the graphic style I employed. Raxworthy (2018) is a good example of the judicious use of plans to accompany case studies, and also served as an inspiration. In this section I will briefly describe the two main types of mapping methods I used: the figure-ground and layering.

#### FIGURE-GROUND

The figure-ground plan is a staple of planning and design practice. It has its antecedents in mediaeval military mapping but was in time widely adopted for civic planning purposes, most notably in the 1748 Nolli plan of Rome (Hebbert, 2016). It is typically composed of the building footprints drawn as 'fills' or 'poché' on a field of white from which emerges 'voids' in the residual space between the fills. Part of my interest in using this type of representation is that it has been particularly associated with public space design—being used in seminal texts such as Sitte's The Art of Building Cities or in more contemporaneous texts such as Trancik's *Finding Lost Space*—as well as for its use in morphological analysis of urban form. Sease (2015) has argued for the importance of the figure-ground in landscape urbanist practice, despite a tendency of this movement to reject figural space. He points out that in its historical forms (such as Nolli's map) figure-ground maps include many more details in the 'voids' such as plantings, stairs, monuments, fountains, etc. To an extent, I have attempted to hew closer to this form of figure-ground (as opposed to maps composed exclusively of fills and voids) on two occasions. First, the figure-ground of Brussels, due to the availability of high-resolution CAD drawings, includes spaces that are open at ground-level, showing only columns and monuments as fills, rather than an aerial view of a building projected onto the ground plane. Secondly, for the figure-ground plans of individual open spaces I have added shades of black to differentiate plantings/green space, pedestrian space, and buildings from vehicle space. I borrowed heavily, in this regard, from diagrams included in Bergahauser Pont and Haupt's Spacematrix: Space, Density and Urban Form (2010) and Kullmann (2011).

#### LAYERING

One of the greatest pitfalls of figure-ground maps is their inability to convey other variables that characterize space (Hebbert, 2016). To remedy this, I have tried to subvert the tropes of figure-ground further by using them in exercises of map 'layering.' This is a process I adapted from the architect Paul Lukez's monograph, *Suburban Transformations* (2007). In this book, he lays out his 'adaptive design process,' one component of which involves mapping and 'cross-mapping' the different physical and cultural layers that give places their identity. In the site analysis section of my case studies I essentially layer my base figure-ground of the respective sites onto topography, infrastructure systems, and building uses.

#### TYPOLOGY OF OPEN SPACES

The last component of my methods that remains to be explained is the typologies by which I have classified individual open spaces in my case studies. To move beyond simply a form-based analysis, I have chosen to apply both a form typology (FM) and a function typology (FN) to each space. I was inspired in this by Carmona (2015) in which the author similarly provides functional and form typologies of different public space case studies in London. I have also borrowed some of his nomenclature and adapted his definitions of them to suit my needs. I have combined this with the typology laid out in Wolfrum (2015), a monograph of European 'squares.' This text also inspired the style of my 3D representations of some of the open spaces. Finally, for those open spaces that I catalogue which meet his definitions of being 'thin,' I apply Kullmann's (2011) typology for such spaces (as a function typology). In the table below I define the nomenclature I applied in my case studies. From Kullmann (2011) I also drew the inspiration to include metrics for the connectivity and continuity of the open spaces in terms of the number of pedestrian access points (cross-walks, abutting sidewalks, etc.—denoted 'A') and the number of streets that fracture the continuity ('F').
## FORM TYPOLOGY (FM)

THIN	A THIN SPACE IS DEFINED BY HIGH PERIMETER TO AREA RATIO.
GARDEN	THE GARDEN IS MOST PROMINENTLY CHARACTERISED BY VEGETATION.
JOINT	THE JOINT SIMULTANEOUSLY BELONGS TO TWO DIFFERENT SPATIAL SYSTEMS THAT CONVERGE AT THIS SPACE.
INTERFACE	THE INTERFACE MARKS THE ABUTMENT OF TWO DISTINCT MORPHOLOGICAL SYSTEMS.
PIAZZA	THE PIAZZA HAS A REGULAR GEOMETRY AND IS OFTEN DISTINGUISHED BY ITS HARD SURFACE AND FORMAL NATURE.
HUB	THE HUB IS AT THE INTERSECTION OF SEVERAL ROUTES.
BELVEDERE	THE BELVEDERE PROVIDES SCENIC VIEWS DUE TO ITS INTENTIONALLY ELEVATED AND EXPOSED POSITION.
INCIDENTAL	AN INCIDENTAL SPACE DERIVES ITS FORM FROM WHATEVER SPACE WAS LEFTOVER FROM A MORE SIGNIFICANT STRUCTURE.

## FUNCTION TYPOLOGY (FN)

CORPORATE	A CORPORATE SPACE IS SURROUNDED BY OR IMMEDIATELY ADJECENT TO PREDOMINANTLY PRIVATE OFFICE SPACE WHICH DEFINES ITS FUNCTION.
REPRESENTA- TIONAL	A REPRESENTATIONAL SPACE HAS PLAYS A ROLE IN HOSTING CIVIC ACTIVITIES, OR IN CONNECTION WITH NEARBY BUILDINGS HAS A PRESTIGIOUS FUNCTION.
FILTER	THE FILTER IS DOMINATED BY CROSS-FLOWS THAT IT SELECTIVELY (RE)DISTRIBUTES AS IF HAVING A REFRACTIVE EFFECT.
CONDUIT	THE CONDUIT MAINLY SERVES TO CONVEY FLOWS IN ITS LONGITUDINAL DIMENSION.
SUTURE	THE SUTURE IS PRIMARILY AN ATTEMPT TO 'STITCH UP' A PAST RUPTURE IN THE URBAN FABRIC.
COMMUNITY	A COMMUNITY SPACE IS HIGHLY-PROGRAMMED AND IS USED MAINLY BY LOCAL RESIDENTS.

#### WORKS CITED

- Bergahauser Pont, M., & Haupt, P. (2010). *Spacematrix: Space, Density and Urban Form.* Rotterdam: NAi Publishers.
- Bonsiepe, G. (2007). The Uneasy Relationship between Design and Design Research. In R. Michel (Ed.), *Design Research Now* (pp. 25–39). Basel: Birkhäuser.
- Carmona, M. (2015). Re-theorising contemporary public space: a new narrative and a new normative. *Journal of Urbanism*, 8(4), 373–405. https://doi.org/10.1080/17549175.2014.9 09518
- Clay, G. (2003). Crossing the American grain with Vesalius, Geddes, and Jackson: the cross section as a learning tool. *Everyday America: Cultural Landscape Studies after JB Jackson*, 109–129.
- Desimini, J., & Waldheim, C. (2016). *Cartographic grounds: projecting the landscape imaginary*. New York: Princeton Architectural Press.
- Gehl, J. (2011). Life between buildings: using public space. Washington, DC: Island Press.
- Hebbert, M. (2016). Figure-ground: history and practice of a planning technique. *Town Planning Review*, *87*(6), 705–728. https://doi.org/10.3828/tpr.2016.44
- Hung, Y.-Y., & Aquino, G. (Eds.). (2013). Landscape Infrastructure: Case Studies by SWA, Second and Revised edition. Basel, Switzerland: Birkhäuser.
- Ivers, B. C. (Ed.). (2018). Staging Urban Landscapes: The Activation and Curation of Flexible Public Spaces. Basel: Birkhäuser.
- Jacobs, J. (1961). *The Death and Life of Great American Cities* (2011 Moder). New York: Modern Library.
- Krieger, M. H. (2004). Taking pictures in the city. *Journal of Planning Education and Research*, 24(2), 213–215. https://doi.org/10.1177/0739456X04271625
- Krieger, M. H. (2011). Media tools for urban design. In T. Banerjee & A. Loukaitou-Sideris (Eds.), *Companion to Urban Design* (pp. 238–248). Milton Park, Abingdon, Oxon: Routledge.
- Kullmann, K. (2011). Thin parks/thick edges: Towards a linear park typology for (post) infrastructural sites. *Journal of Landscape Architecture*, 6(2), 70–81. https://doi.org/10. 1080/18626033.2011.9723456
- Lenzholzer, S., Duchhart, I., & Koh, J. (2013). "Research through designing" in landscape architecture. *Landscape and Urban Planning*, 113, 120–127. https://doi.org/10.1016/j. landurbplan.2013.02.003
- Lukez, P. (2007). Suburban Transformations. New York: Princeton Architectural Press.
- North, A. (2012). Operative Landscapes. Zürich: Birkhäuser.
- Raxworthy, J. (2018). *Overgrown: practices between landscape architecture & gardening*. Cambridge, Massachusetts: The MIT Press.
- Schultz, H., & Etteger, R. van. (2017). Walking. In A. van den Brink, D. Bruns, H. Tobi, & S. Bell (Eds.), *Research in Landscape Architecture* (pp. 204–219). Milton Park, Abingdon, Oxon: Routledge.
- Sease, A. (2015). Landscape (and) urbanism? Engaging Nolli. *Journal of Urbanism*, 8(4), 352–372. https://doi.org/10.1080/17549175.2014.909517
- Sitte, C. (1996). L'art de bâtir les villes: l'urbanisme selon ses fondements artistiques. Paris: Éditions du Seuil.

- Smets, M., & Shanon, K. (2016). *The Landscape of Contemporary Infrastructure*. Rotterdam: naio10 Publishers.
- Swaffield, S. (2017). Case Studies. In A. van den Brink, D. Bruns, H. Tobi, & S. Bell (Eds.), *Research in Landscape Architecture* (pp. 125–140). Milton Park, Abingdon, Oxon: Routledge.
- Whyte, W. H. (1980). *The social life of small urban spaces*. Washington, D.C.: Conservation Foundation.

Wolfrum, S. (Ed.). (2015). Squares: Urban Spaces in Europe. Basel, Switzerland: Birkhäuser.



# 4 JONCTION NORD-MIDI BRUXELLES

#### INTRODUCTION

This chapter contains the first of two cases studied during this project. The case consists of the urban spaces above or adjacent to an underground train junction located in the historic centre of Brussels, Belgium that is commonly referred to as the 'Jonction Nord-Midi.' Of course, the Jonction Nord-Midi refers in its most literal sense to the tracks, ballast, tunnels and viaducts that physically enable trains to cross the city, but it has also come to refer to those urban areas built above or adjacent to it. To make this interchangeable nomenclature clearer, I will be forthwith using the more evocative 'Jonction Nord-Midi' to refer to the urban areas and the rail project in its conceptualization, while employing the terms 'rail junction' or their equal to refer to the infrastructure itself. The rail junction is a six-track-wide rail corridor that alternates, longitudinally, between elevated and underground segments linking together three of the of the most important passenger stations in Belgium: Gare du Nord and Gare du Midi at either of its extremities (hence its name) and the Gare Centrale in the middle. My analysis of the case is composed of multiple sections that will, in sequence, provide the reader with a brief history of the Jonction Nord-Midi as an urban and infrastructural planning endeavour, a site analysis of the entire study area, and a detailed descriptive catalogue of open spaces located in the study area, before launching into a discussion that will bring these different elements together.

### BRIEF HISTORY

The Jonction Nord-Midi is undoubtedly one of the most important built projects of modern Belgium. Through the combination of its size and its location it had a significant impact on the development of the national and local rail networks, the distribution of economic activity, and has been, as we shall see, the cause of many an urbanistic under-taking (Jaumain & Boquet, 2004, p. 19). As befits a project of its proportions, the Jonction Nord-Midi was the subject of debate and tentative plans long before its final form was concretized. As is typical of such projects, however, bits and pieces of the various iterations of the visions, plans, and designs have inevitably found their way into the executed projects and it will therefore be useful to briefly trace the history of the project.

#### ORIGINS OF THE JONCTION PROJECT

While it was officially opened to passengers on October 4<sup>th</sup>, 1952, the desire for a rail link traversing the city from north to south existed as early as 1836, when city officials requested the construction of a station within the heart of Brussels (Sylvestre, 2004, p. 53) The first rail line to cross the city in any way was a single-track freight line installed on the *boulevard de ceinture* (itself occupying the circuit of the medieval city walls). Only haphazardly separated from other forms of traffic, it is not difficult to see why this was only ever intended as a temporary measure (Sylvestre, 2004, p. 54).

Once the permanent Gare du Nord (1846) and Gare du Midi (1839 as the Gare des Bogards, 1869 the first station in its current location) were built, it only became more common and urgent to envision a direct connection between Brussel's termini stations. Indeed, passenger traffic between the more southerly and the more northerly burgeoning rail networks is transiting through Brussels regardless of the lack of junction and forcing

the traffic onto city streets. The inability for passengers coming from Antwerp, Liège, or Germany to connect directly to trains going to Ghent, Ostend (London, by ferry), or Paris was later described by Patrick Abercrombie as 'a failure of contact in an electric circuit' (quoted in Nilsen, 2008, p. 145).

In 1855, two civil engineers and a general contractor each proposed their own version of a train junction. Two of these—those proposed by civil engineers—are for elevated railways that follow a generally more western alignment along the canal or the river Senne, while the third proposal suggested an underground link in the east on the basis that it would be the most aesthetic solution. Its promoter, Albert Dubois-Nihoul, went so far as to suggest that a tunnel would have no impact on 'the appearance of roads, the disposition of buildings, and will not inconvenience residents' (quoted in Sylvestre, 2004, p. 56; translation my own). All these projects were rejected by municipal authorities on the basis of doubts as to their feasibility (Sylvestre, 2004, pp. 57–58).

#### JONCTION AS MEANS TO OTHER ENDS

In the following years, there is a marked tendency for solutions to what was at first a practical infrastructural problem to assume greater ambitions. In 1856, the 'rue de fer' is proposed as a combined rail, hygiene, and real estate project that would have seen the city transected by an excavated way bounded on either side by all-new buildings within which the rail lines would have been fully integrated, in the same vein as the Crystal Way of London (1855) and Arcade Railway of New York (1868) (Alonzo, 2018, pp. 266–269; Sylvestre, 2004, p. 59). The association of hygienist and infrastructural goals would initially gain the most traction as further proposals to use the route of the Senne made clear the possibility to simultaneously construct the rail link and remediate the open-sewage conditions of the river running through the city. The first major proposal for covering up the Senne was put forward in 1858 by François Wellens, chief engineer of the Belgian *Ponts et Chaussées*, but for reasons of means and political priorities was not executed (Martiny, 1976, p. 274; Sylvestre, 2004, p. 61).

The sanitization of the Senne being the greater preoccupation, a public competition is organized between 1863 and 1865 that saw many amongst the more than 40 submissions include schemes for integrating a rail junction in their designs (Sylvestre, 2004, p. 65). One of these, by Pierre Keller, which featured a plan to reroute the Senne and construct the rail junction in the vacated riverbed below a double-vaulted tunnel, was selected as the winner in 1865 only to be shelved in 1872—again due to shifting political priorities and a fear from municipal officials that including the railway in the project would loosen its control over its execution in favour of the central state (Sylvestre, 2004, pp. 66–67). While no further official attempts were made to build the Jonction Nord-Midi in the 19<sup>th</sup> century, the covering up of the Senne did go forward, and this first instance of 'great urban surgery' (Martiny, 1976, p. 274, my translation) would go on to serve as both precedent for the possibilities of large urban public works and warning as to the popular opposition they generate.

#### MODERN FORM OF THE PROJECT

The Jonction Nord-Midi in the dimensions and alignment that were completed in 1952 was conceived by Frédéric Bruneel in 1893. The key to his design—inspired by Berlin's Stadtbahn of 1882—was to transform the north and south stations into elevated through stations that could convey trains between them by-way of a nearly two-kilometre long tunnel below the eastern sector of the city centre from Notre-Dame-de-la-Chapelle to the Jardin Botanique (Nilsen, 2008, p. 152; Wiener, 1912). Funding for the project was



CRYSTAL WAY, LONDON, 1855



RUE DE FER, BRUXELLES, 1856



ARCADE RAILWAY, NEW YORK, 1868

finally allocated in 1900 and moved forward in coordination with a few other high-profile urban projects. Indeed, whereas in days past the construction of the Jonction had, as we saw, been tied to the hygienist covering up of the Senne, the name of the day was urban renewal and monumentality.

The creation of the Jonction and its new central station in the Putterie neighbourhood of the city, just below the royal palace perched on the Coudenberg hill, was seen as a welcome addition to the king's pet project to connect the upper and lower towns through the park-and-library complex of the Mont des Arts (Martiny, 1976, p. 289; Nilsen, 2008, pp. 151–152). This was an early example of the contested nature of the Jonction's urban design, as the king's monumental vision, influenced by Haussmann, was from its conception opposed by mayor Charles Buls, himself influenced by the work of Camillo Sitte (Nilsen, 2008, p. 152). The latter's preferences were initially fulfilled in 1910 by the urgent conversion—in preparation for a universal exhibition—of that part of the Mont des Arts site already vacant of buildings into a much more modest terraced park (Martiny, 1976, p. 289).

An agreement between the municipality and state in 1903 established their respective responsibilities as well as the design specifications of the Jonction. The city would be responsible, as was its legal requirement, for all expropriations. The state would be responsible for demolition and actually executing the construction of the rail junction. Included in the agreement were the reconfigurations of the most heavily-impacted neighbourhoods (Nilsen, 2008, p. 153).

#### START-AND-STOP CONSTRUCTION

The city carried out its share of the responsibilities assiduously, with a majority of the 1,500 buildings expropriated by 1911 while by the time start of the First World War in 1914 the state had carried out only some demolitions and preliminary drainage works (Nilsen, 2008, p. 153; for the number of buildings Martiny, 1976, p. 288). The war put the works on hold but they were restarted immediately following its end, only to be suspended again on numerous occasions for further study as politicians of all stripes frequently vacillated in their support of the project (Martiny, 1976, p. 285; Nilsen, 2008, p. 153). After the economic crash of 1929, work on the Jonction only entered its final stages its construction following the creation of the *Office National pour l'Achèvement de la Jonction Nord-Midi* (O.N.J.), a decisive moment in its history (Deligne, 2004, p. 69). Worked slowed again during German occupation up until 1943 after which shortages of both material and labour prevented the project progress with any amount of pace until 1950, leading to inauguration in 1952 (Nilsen, 2008, p. 155).

#### ABOVE-GROUND CONDITIONS

What is striking about the execution of the Jonction Nord-Midi project from an urbanistic perspective is the lack of overall vision—despite a 115-year gestation period and over 40 years of construction—for what should be (re)built following the completion of the rail infrastructure (with the exclusion of the Mont des Arts whose genesis, as we saw, was ulterior to the Jonction project). Certainly, in the interwar period the project had taken on slum-clearance and urban renewal dimensions, as the discrepancy between area needed for construction (7 ha) and that which was affected by demolitions (17 ha) makes clear (Nilsen, 2008, p. 159). An advisory committee formed in 1945 anticipated modern city plans catering to 'new circulation patterns that combined buildings and open spaces' but nothing nearly as coherent was ever put into action (Nilsen, 2008, p. 162). Deligne (2004) suggests that while repeated economic and historical shocks (i.e. the world wars) can account for slow progress and frequent modifications, it is the conceptualization of the city by municipal and national politicians that is to blame for the lack of coherent plans to guide the reconstruction efforts.





That which was built was the result of piecemeal interventions, mostly in the form of large individual buildings. A more detailed discussion of form and morphology will follow in the site analysis section of this chapter, but for the present it is worth noting the main elements of the reconstruction era from 1952-1990 to provide a sense of chronology going forward. A series of undulating boulevards were the first above-ground armatures onto which any reconstruction efforts might be hung. From north to south, the building of the Jonction created the following arterial roads: boulevard Saint-Lazare (1953), boulevard Pachéco (1952), boulevard de Berlaimont (1952), boulevard de l'Impératrice (1930s), and boulevard de l'Empereur (1957).

The first new building to be finished was the Gare Centrale in 1952, based on original designs by Victor Horta but whose completion was overseen by Maxime Brunfaut (son of Fernand Brunfaut, who had headed the O.N.J. in its final years). Maxime Brunfaut was responsible for a further three other buildings along the Jonction Nord-Midi: the intermediary train stop of Bruxelles-Congrès (1952), the Sabena air terminal immediately adjacent to the Gare Central (1954), and the headquarters of the Belgian Social Party (1964, Brunfaut father & son were members of the party). The Banque Nationale de Belgique expanded its facilities to include new buildings flanking either side of the boulevard de Berlaimont built between 1948 and 1957 to designs by Marcel Van Goethem. This architect had also been responsible, alongside Alexis Dumont, for the Shell Building (1931-1934) located across from the Gare Centrale that was the result of an earlier phase of building. The Galerie Ravenstein, a covered shopping gallery, was constructed between 1954 and 1958 by Dumont and his brother in between the Shell Building and the Monts des Arts complex. This latter project was completed by the addition of three built elements: the Palais des Congrès by Jules Ghobert (1955-1958), the Bibliothèque Royale de Belgique by Maurice Houyoux (1954-1969), and the Jardins de l'Albertine by René Pechère (1957-1958). Finally, the largest project of note was the Cité Administrative de l'État, a vast complex of office buildings to house as many as 14,000 federal bureaucrats was built along the northern side of the boulevard Pachéco between 1958 and 1980. This complex also featured a 'suspended' garden designed by René Pechère, whose ambition had been to 'drown these modernist buildings in an immense drape of flowers, asymmetrical strewn with numerous square basins, like in a painting by Paul Klee.' (quoted in Bral, 2007, p. 43, translation my own).

#### BACKLASH

Worth noting here, though it will be elaborated in discussions later in this chapter, the protracted construction period of the Jonction Nord-Midi and the lack of concerted plan for the rebuilding of what had been popular neighbourhoods incited much backlash from the public. Beyond the worn appellations of urban 'scar tissue' or 'wasteland,' a surgical vocabulary recalling the first major infrastructural disturbance, the covering up of the Senne, has been used to qualify the Jonction Nord-Midi as a 'second bloodletting' that has contributed to making Brussels a 'martyr of urbanistic surgery' (Nilsen, 2008, p. 161). As in other cities affected by impassive central planning, Brussels witnessed the emergence of activist networks and committees to counter future disagreeable proposals. Some, like the Atelier de recherche et d'action urbaines (ARAU), founded in 1969, continue to weigh on projects to this day including, as we shall see, recent interventions along the Jonction Nord-Midi.



#### SITE ANALYSIS

The site analysis presented here is composed of two parts. The first is an analysis that considers the entirety of the Jonction Nord-Midi as I have identified it. The extent of this area is represented by the footprint of buildings in black throughout a series of analytical maps. Since there is no strict definition or boundaries to the area that falls within the zone of influence of the Jonction Nord-Midi, I have had to use discernment, based on personal knowledge and experience as well as the written record, to establish a strict cutoff where spaces and buildings are within the study area or not. I have adhered to a few self-imposed rules in order to be consistent: in all cases I have included the entirety of an urban block making a street the cutoff; any block that fronts the boulevards built above the train junction have been included; finally, where buildings constructed post-Jonction make up the entirety of a block along the boulevards, I have included an additional block beyond these for context. Buildings outside of the study area are depicted with a pale grey outline to provide even more context and points of reference for the reader that knows Brussels. Analysis of the Jonction-as-a-whole follows a thematic approach that will look at the built form in the light of its biophysical context (topography, geology, etc.), its morphological features, its location within interlocking networks of infrastructure, and the uses the buildings are devoted to.

Almost all of the graphic data used to produce the graphics in the following pages were obtained through the Région de Bruxelles Capitale's online urban data portal, Urbis digital mapping, that is freely available. The finished maps, however, are also the result of many modifications and editorial choices. I have variously added, removed, and combined the different layers of cartographic information in order to obtain visuals relevant to the thematic analyses I have carried out. As previously mentioned, all maps retain some of the same elements for consistency, most importantly the figure-ground style building footprints (except for the building use maps, that colourizes the footprints according to use, instead of leaving it black). While the morphological analysis is illustrated by—and based on—a typical figure-ground map, each of the other thematic maps seeks to subvert or rectify some of the limitations of figure-ground maps by including elements that they often omit, such as contours, uses, other structures (infrastructure). and ownership, while maintaining the graphic consistency the solids and voids. In addition, all of the maps are presented at the same scale (indicated graphically) in frames of the same size and positioning on the page and are all oriented such that the top of the page is north.

In order to move beyond cartographic plan views, the second part of the analysis consists of a catalogue of open spaces in which photographs and, in some cases, 3D representations have been included to convey a sense of these places. Greater details on the representation methods is included as a preamble to that section.



#### BIOPHYSICAL SITUATION

The Jonction Nord-Midi was built at the edge of the Senne River valley, roughly parallel to the course of the river, and at the edge of the plateau on which sits the upper town of Brussels. The reasons for this, from an engineering perspective, are quite obvious. Railroads require as few changes in elevation as possible and can only tolerate shallow slopes. In closely hugging the +25 metre contour, it became possible to keep the slope of the Jonction Nord-Midi to no more than 3 millimetres per metre in its longitudinal profile. The Gare du Nord and Gare du Midi are both at slightly lower elevations, but since the tracks are elevated, it enables the train junction to cross the roads in their vicinity while keeping a level profile. However, because of this topographic situation, the Jonction Nord-Midi has significant grade changes in its transversal profile, which surely has not helped its perception as an obstacle in the urban fabric. This was a fact that was true for the neighbourhoods present before the construction of the Jonction, and one objectives of the Mont des Arts project was to improve connections between the lower and upper town. At the same time, this transversal difference in elevation affords those parts of the Jonction on the upper side of the slope great views of the lower town even as it makes building heights that much more imposing.



#### FIGURE-GROUND OF THE JONCTION NORD-MIDI IN THE BRUSSELS REGION



#### MORPHOLOGY

The most striking characteristic immediately obvious from the figure-ground map above is the contrast between the size of the buildings within and beyond the study area. In particular, the buildings within the Jonction at its northern end and in the centre have particularly large footprints compared to the buildings immediately adjacent to the study that are the result of vernacular or 19<sup>th</sup> century urbanization processes. A close corrollary to this observation is the similar disparity in block sizes that contributes to a much coarser grain within the Jonction than beyond. These are aspects that the Jonction shares with other sectors of Brussels that have undergone massive urban renewal, such as the European Quarter (the orthogonal grid sector centre-right on the map) or the Quartier Nord (immediately to the left of Gare du Nord).

In itself, the organic curve of the boulevards above the Jonction represent a much greater potential for a diversity of viewpoints on a route through the inner city than the Haussmannian alignment of the boulevards du Centre (an elongated Y, centre of the 'pentagone') or the baroque alignment of the *tracé royal* (edge of the Jonction area in the centre, and angling towards the Palais de Justice's large footprint bottom-centre). As armatures, the Jonction boulevards do anchor most of the buildings except in the centre where the relationship to the road of some buildings was intentionally disconnected (e.g. Sabena Air Terminal). The centre of the Jonction is also the only area where any attempt has been made to place buildings facing away from the boulevards and, through a dialog with pre-existing fabrics, create open spaces outside of the trajectory of the rail junction.



#### INFRASTRUCTURES

The value of most infrastructures comes from the extent of its network and its degree of connectivity to other networks. In the above map, I have overlayed the mainline rail, metro, and tram networks. Within the *pentagone* that bounds the 'hyper' centre of the city, three main rail transit conduits cross from in the north-south direction. There is the mainline rail junction of the Jonction Nord-Midi, of course, but interestingly it is paralled to the east by a surface tram route along the *tracé royal* and to the west by the pre-metro lines running beneath the *boule*vards du Centre. The centre is also ringed by rail transit that follows the pentagone, the metro on the east and surface tramways to the west. Three of the major points of convergence between the different networks occur on the Jonction Nord-Midi. The only east-west rail transit through the centre of the city crosses the Jonction at Gare Centrale. While the metro station is not located immediately beneath the Gare Centrale mainline train station, it is linked directly by an underground tunnel. A second point of convergence within the Jonction is at Place Rogier, where the pre-metro and metro networks cross, in close proximity to Gare du Nord where the pre-metro and mainline rail networks cross. The final point of convergence is Gare du Midi where elements of all networks intersect. This demonstrates the key position that the Jonction—understandably—continues to hold in transport infrastructure networks in Brussels. This will remain just as true after the next major rail transit projects: the conversion of the premetro to a full metro, which will cross the Jonction at either end, and the capacity increase for the mainline junction.



#### BUILDING USES

The building uses identified on the map above are from a survey of de-facto uses originally carried out in 1999 and updated since. As I noted in the history section of this chapter, one of the general perceptions attached to the Jonction Nord-Midi is that almost all new buildings were monofunctional administrative or office buildings. While this is certainly the case of many of the larger buildings located in the northern and central parts of the Jonction, what this map of building uses reveals is that there is a relative diversity of uses. This is especially true in the southern part of the Jonction, where one might expect the elevated rail line to have caused the greatest fragmentation of pre-existing fabrics. While this may be the case, it seems not to have prohibited a diversity of uses from being maintained. This may also be due to the presence of many public institutions, mostly schools of various kinds, that may serve as anchors in these neighbourhoods. Another area of increased diversity of uses is the central area of the Jonction just west of Gare Centrale. This, as I noted before, is one of the locations where new buildings face towards the pre-existing fabrics. The use of these buildings as hotels is also very compatible with the tourist-oriented shopping, eating, and attractions that are found around the Grand Place, which is just to the west. Overall, even among those buildings with a mix of uses, very few have a high mix of uses.

#### **OPEN-SPACE CATALOGUE**

These spaces were identified for further study after repeated visits to the Jonction Nord-Midi and interaction with scholarly, professional, and other written media pertaining to these spaces. In some cases it was obvious that the space should be included, either because it was key to the history of the Jonction (e.g. the Carrefour de l'Europe), because of its size and location (e.g. the Mont des Arts), or for being out of the ordinary in some way (e.g. the Cité administrative de l'État). When its inclusion might seem less obvious, I have tried to include some explanation of my reasoning in the space's description. The illustrations, photographs, and layout for the following pages were established before the writing of the descriptive texts took place. In a sense, the process of cataloguing the different open spaces constituted a large part of the analysis of these spaces. Restricting myself to two main formats for presenting the spaces (one with 3D representation and one without) forced me to consider which of the photographs I had taken would convey the best sense of each space.

The photographs were taken during the (previously described) 'urban traverses' in which I sought to be as systematic as possible in the selection of photograph subjects and framing, taking the time to experience each space, with particular attention given to three elements: ensemble views of the spaces and their contents, details in furnishing or materials, and specificity of each space's atmosphere. I have done my best to include a sample of each, though this was not always possible when spaces were included after the fact. The plan diagrams included for each space are akin to figure-ground maps, but instead emphasize in their voids the difference between usable pedestrian or green space (dark grey and black) and the total space between buildings (pale grey). These values are reflected in the area values in each 'fact sheet,' which also include typological classification (see methods chapter), and project information about regarding the latest architectural/landscape/planning intervention. The 3D visualizations included for some of the larger open spaces are extracted from 3D models created by the Région de Bruxelles-Capitale, that I stylistically simplified to white surfaces and black line edges to focus attention on the volumes of buildings and spaces. The only details I added, by photo montage, are illustrations of trees. Though I cannot attest to the accuracy of species, I did make an attempt to select trees similar in dimensions to those present on the sites, and their number and position are accurate (as based on other official mapping sources).



PLACE ROGIER









Place Rogier is a large, flat plaza paved in Belgian blue stone, which lends it a certain understated elegance. The Gare du Nord of 1846 sat on the northern edge of this square. which served as a forecourt. It continues to be such for a 36-storey, glass-facade office building, the Rogier Tower (2006), that is the headquarters for a major bank, and whose only notable feature is the extravagant number of LEDs that project a light show at night. Place Rogier has been entirely rebuilt in the past decade on the basis of a scheme that actively sought to reduce the amount of space entirely dedicated to cars. Currently, motor vehicles can only cross the squares on two of its edges and in both cases there is a continuous ground plane for pedestrians. The demarcation between exclusive pedestrian space and shared space is indicated by bollards. One of the major features of the redesign is a large structure that overhands over the square. Through an open-air escalator beneath it, one can access the underground transit station and shopping galleries. The visual continuity between above ground and below ground contributes to the legibility of the space. The structure acts as a focal space for the entire square, which would otherwise be lacking in distinctive features. A space in the canopy structure contains a café (sadly occupied by a worldwide chain) that constitutes one of the few retail offerings on the square. While there is no greenery on the square itself, widened sidewalks stretching away from Place Rogier feature plantings added since the re-design that lead towards green spaces close to the site (the Jardin Botanique and park-median of the Boulevard Roi Albert II).

AREA	CONNECTIVITY	
<b>G</b> 14,500 m <sup>2</sup>	<b>A</b> 15	
<b>N</b> 10,300 m <sup>2</sup>	<b>F</b> 3	
TYPOLOGY	INTERVENTION	

**INTERVENTION** FM PIAZZA Y 2006-**FN** CORPORATE

**D** XGDA, MICHEL DESVIGNES C 29,000,000 EUR

USES OFFICES/HOTELS/ COMMERCIAL



#### JARDIN DE LA CITÉ ADMINISTRATIVE

The Cité administrative de l'État is one of the most peculiar places in the Jonction Nord-Midi. Having lost its main purpose as the centre of the federal administration, the complex was sold for private redevelopment in the early 2000s. Since then, it has been subject of a number of special plans and development schemes that have yet to take full form. Trying to access the Cité administrative from the Jonction side is nearly impossible. An entrance to its gardens from the south side has been blocked by breeze-blocks, while its frontage on the Boulevard Pachéco is mostly a blank concrete wall, a service station, and indoor parking entrances. Entrance from the north side is the most evident. Arrival in René Pechère's gardens is ethereal. The atmosphere is attributable to both Pechère's work and the unkempt state of the park, which has numerous overgrown areas. While there was originally a large restaurant fronting the gardens, in its current state there are no other uses beyond park space. There was once a direct access from the gardens to the Bruxelles-Congrès train stop, which is below ground, but these have since been closed.

AREA G 16,000 m <sup>2</sup> N 16,000 m <sup>2</sup>	CONNECTIVITY A 3 F 0
TYPOLOGY FM GARDEN FN CORPORATE	INTERVENTION Y - D - C -
USES OFFICE	



#### ESPLANADE DE LA COLONNE DU CONGRÈS

This plaza was designed by René Pechère at the same time as the gardens of the Cité Administrative and is linked to them through a large staircase. The aim was to maintain viewpoints between the Place du Congrès that has been a viewpoint onto Brussels since the 19<sup>th</sup> century. The esplanade is vast but empty. Despite many of the office buildings being empty, at the time of visit a significant number of people had made their way to the esplanade on their lunch hour, likely because of the calm atmosphere and the views. One strange feature of the esplanade is that is slightly elevated above the Place du Congrès and this creates the sense that the two spaces are more separate than they need be. Allegedly, this feature is due to the parking structure below. While the views onto the city are worthwhile, the lack of direct access from the esplanade down to the rest of the city limits the potential of the space.

AREA	CONNECTIVITY
<b>G</b> 16,000 m <sup>2</sup>	<b>A</b> 5
<b>N</b> 12, 500 m <sup>2</sup>	<b>F</b> 4
TYPOLOGY	INTERVENTION
FM BELVEDERE	Υ -
FN REPRESENTA-	D -
TIONAL	C -

#### USES OFFICE



















#### PLACE SAINTE-GUDULE

This open space was until very recently two grassed spaces separated by a street almost entirely dedicated to parking. The most recent intervention was designed by French architect Alain Safarti. It created an urban bosque composed of trees planted in a very regimented pattern. The park design is very geometric, featuring to two systems of parallel parks each angled on a different building which meet at an angle in the central axis of the park. Being diagonal to any surrounding streets, the paths create convenient ways of cut across the space in all but one direction (south-west/north-east). All the paths are paved in Belgian blue stone and are separated by grass lawns. Two different types of seating a distributed across the park: lawn chairs made of wooden slats and individual, upright chairs that are placed so as to evoke whimsicalness even though they are fixed in place. The presence of a planted space in front of the medieval cathedral makes for an unusual experience as the monument is discovered gradually through the branches instead of framed by a monumental axis. Place Sainte-Gudule therefore is a mediating space between old and new, while giving more character and sense of place to a void left behind by the construction of the Jonction Nord-Midi.

AREA G 9,400 m <sup>2</sup> N 4,600 m <sup>2</sup>	CONNECTIVITY A 7 F 4
TYPOLOGY	INTERVENTION
<b>FM</b> INTERFACE	<b>Y</b> 2003 - 2016
FN FILTER	D ALAIN SAFARTI
	<b>C</b> -
USES	
OFFICES/PUBLIC	











#### CARREFOUR DE L'EUROPE + IMPÉRATRICE

I combined here what would otherwise logically be two separate spaces that cross: th Carrefour de l'Europe plaza that fronts Gare Centrale and the Boulevard de l'Impératrice The reason for this is that both were the subject of a combined renovation project carried ou between 2002 and 2012 following an international competition in 1997. Like in the redesign of Place Rogier, one of the key changes was reducing the amount of space dedicated to vehicle and increasing pedestrian spaces. Critically, the Boulevard de l'Impératrice was physical divided such that traffic can no longer cross the Carrefour de l'Europe. Unfortunately, th remaining roadways are separated from the pedestrian space by both bollards and curb. and they have an asphalt pavement that creates a physical discontinuity. On the other hand a ground-level passage through one of the buildings facing Gare Centrale allows direct movement towards the historic city centre. A median was introduced on the Boulevar the l'Impératrice that features long wooden benches and is planted with trees, but a lack of other distinctive features, the continued presence of two lanes of traffic on either side, an four occasions where the roadway interrupts the median does not limits the aesthetic an practical appeal of the space. The Carrefour itself is a much more compelling space, with th circular canopy giving a coherence to the space that overcomes a roadway cutting a corne New uses have sprung up, notably a brewpub making use of the vast Sabena Air Termina across from Gare Centrale. Within the station, the building renovation that happened parallel to the exterior changes, has increased the number of commercial spaces easily accessible from to the majority of users that are in any case transiting through the station.

ne e. ut of	<b>AREA</b> <b>G</b> 11,700 m <sup>2</sup> <b>N</b> 4,500 m <sup>2</sup>	CONNECTIVITY A 14 F 4
es	TYPOLOGY	INTERVENTION
ly	FM HUB/THIN	<b>Y</b> 1997 - 2012
ne	FN CONDUIT	D ALAIN SAFARTI
s,		<b>C</b> 6,500,000 EUR
d,	USES	
ct	OFFICE/HOTEL/	
ď	TRAIN	
of		
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Iy		

#### MARCHÉ AUX HERBES + D'ESPAGNE + PUTTERIE

This series of spaces is being considered together because as a whole they form a spatial joint that mediates between different spatial systems and because they result from the same intervention. Up until the lates 1980s, all of the area below the Boulevard de l'Impératrice was an open-air parking lot, which was thereafter buried and new buildings (hotels in a historicist style) were inserted to create several smaller voids and recreate historical roadways. A cobble-paved plaza, Place d'Espagne, was built in between the hotels (to their back) with a few plantings and statues, but with awkward, unnecessarily narrow connections to other spaces. The other three spaces articulate a transition from the Jonction to the medieval city fabric. The Square de la Putterie, named in recognition of a demolished neighbourhood, is a landscaped park that provides a surface connection to the Place Albertine and the Mont des Arts as well as, by way of a trench, a direct access to Gare Centrale's underground platforms. The middle space is landscaped as a *parvis* for the Madeleine church with numerous trees flanking roadways. The final space would appear to be medieval plaza, except that the trees and historicist hotels betray its true age. Nevertheless, it is thronging with tourists and passerby at all times of the day and night, and features many shops and restaurant terraces.

<b>AREA</b> <b>G</b> 12,200 m <sup>2</sup> <b>N</b> 9,700 m <sup>2</sup>	CONNECTIVITY A 14 F 4
TYPOLOGY	INTERVENTION
FM JOINT	<b>Y</b> 1987-1992
<b>FN</b> SUTURE	D -
	C -
USES	
MIXED	





#### PLACE ALBERTINE

This semi-circular plaza was intended as an extension of the Mont des Arts complex but was, and remains, separated from it by the Boulevard de l'Empereur. The most recent modifications to this site were carried out in coordination with the renovation of Gare Centrale, which created a light-well/fountain in the plaza, the rennovation of the Jardin du Mont des Arts, and the redesign of Carrefour de l'Europe + Impératrice. As with the latter, the amount of space dedicated to vehicles was reduced but at the same time two lawns were removed as the entire space was paved over. This is a transitory space in which the lack of any kind of urban furniture discourages extended stays. The space's appeal is also diminished by its size relative to the roadways that surround it (nearly 50% of the space is still dedicated to them) and for being spread across multiple levels. In addition, blue stone pavement has deteriorated and missing pavers have been replaced by patches of asphalt.

x nt re	AREA G 6,300 m <sup>2</sup> N 3,200 m <sup>2</sup>	CONNECTIVITY A 3 F 2
u r, re y	TYPOLOGY FM incidental FN filter	INTERVENTION Y 2003 D ALAIN SAFARTI
y d d s	USES OFFICES/PUBLIC	













#### MONT DES ARTS

The view from the top of Mont des Arts gardens offer is even better than that from the esplanade of the Colonne du Congrès in that it is centred on the Grand Place and the gothic spire of the city hall. René Pechère applied many of the same geometric motifs in his landscaping of these gardens as he later did at the Cité administrative de l'État, and these gardens too are 'suspended.' As in this case the main axis of the gardens is aligned with the drop in elevation, the effect is accentuated. In the latest mahor intervention on the Mont des Arts the gardens were reduced in size to make way for an expansion of the Palais des Congrès. This has the benefit of making the convention more prominent (a glass cube atrium protrudes from the underground complex) and directly accessible from the gardens. In the summer, the sheer number of fountains arrayed in two rows (20 total) lends this space a unique quality not found elsewhere in the Jonction or in the city. There are multiple ways of ascending from the lower town to the upper town through the Mont des Arts-other than multiple sets of monumental stairs through the gardens—including a covered gallery on a street alongside the gardens, or an indoor route through the Galerie Ravenstein. Despite the expansion and rennovation of the convention centre, the Mont des Arts continues to serve only institutional and cultural functions.

AREA	CONNECTIVITY
<b>G</b> 15,600 m <sup>2</sup>	<b>A</b> 7
<b>N</b> 14,300 m <sup>2</sup>	<b>F</b> 1
TYPOLOGY	INTERVENTION
FM GARDEN	<b>Y</b> 2009
<b>FN</b> REPRESENTA-	D A2RC
TIONAL	<b>C</b> 75,000,000 EUR













#### BOULEVARD DE L'EMPEREUR

The Boulevard de l'Empereur is in many ways a mirror to the Boulevard de l'Impératrice. It too contains a promenade-like median, but it is in some regards better. It is interrupted by fewer crossing streets and has more plantings. This is not true of its northern end, which has no landscaping whatsoever and no pedestrian crossings to access it. The buildings along the street are evenly setback, which provides a more regular volume to the space than is true of the Boulevard de l'Impératrice. At its northern end, the Boulevard de l'Empereur features mostly modernist office buildings, but at its southern end, where the series of Jonction boulevards cease to be, there are residential buildings and pockets of retail. Because beyond its trajectory the rail junction emerges from its tunnel and continues on a viaduct to Gare du Midi, the visual perspective terminates on nothing in particular. The skate park that occupies the leftover space between the end of the boulevard and the tunnel entrance has been designed as a skate park in an apparent attempt to serve local needs.

AREA	CONNECTIVITY
<b>G</b> 14,700 m <sup>2</sup>	<b>A</b> 8
<b>N</b> 6,100 m <sup>2</sup>	<b>F</b> 1
TYPOLOGY	INTERVENTION
FM THIN PARK	<b>Y</b> 1957
FN CONDUIT	D N/A
	C N/A
USES	

PUBLIC/OFFICE



#### PLACE DE LA JUSTICE

This is one of the most peculiar spaces along the Jonction Nord-Midi. While a square had historically existed in this location, the current space is the result of raising the Boulevard de l'Empereur above a important road towards the city centre so that the two would not meet at grade. A good third of the square is therefore below the bridge such that the entire space appears to be sunken below ground. Less than a decade ago, this space was not very frequented by pedestrians an account that the space under the bridge was un- or poorly-lit. This was remediated by the city at the same time as the unveiling of a new piece of public art by artist Daniel Buren. This piece, entitled *Bleu sur jaune*, is composed of numerous posts with blue 'sails' that are located on either side of the underpass. This gives a visual continuity to the space and encourages crossing under the bridge. Prior to installing the art piece, the size of the roadway was greatly reduced and a parking lot was eliminated. The Place de la Justice is accessible from the Boulevard de l'Empereur via staircases on three of its four sides.

AREA	CONNECTIVITY
G 4,800 m <sup>2</sup>	A 8
N 3,800 m <sup>2</sup>	F 1
FM PIAZZA	Y 2009
FN CONDUIT	D DANIEL BUREN

**D** DANIEL BUREN
**C** 3,400,000 EUR

USES

OFFICE







#### DISCUSSION

Since the purpose of this chapter is to document the Jonction Nord-Midi to serve as a reference case in the subsequent comparison with the Mount-Royal Tunnel case, the following discussion will help establish the basis for comparability by commenting more explicitly on the Jonction case through the main preoccupations of this project introduced in previous chapters. It will also help synthesize the analysis, descriptions, and observations made in the preceding sections of this chapter. To achieve these aims, I will be drawing attention to links between different parts of the analysis, as well as evaluating the extent to which my preoccupations have been considered by designers, planners, and other stakeholders in the recent (and projected) interventions in the Jonction site.

#### PLANNING AND DESIGNING PUBLIC SPACES IN BRUSSELS

Whereas the first section of this chapter provided a brief history of the infrastructural project that is/was the Jonction Nord-Midi, as well as some of the early urbanistic projects that surrounded it, it is highly relevant to understand the prevailing models for planning and designing public spaces in Brussels over the last few decades. Moritz (2011) provides just such an overview of the trends since the Région de Bruxelles-Capitale was constituted in 1989. He argues that at the time of the transition to this new institutional system, the dominant mode of design for public spaces remained that which had, as we have seen, driven the emphasis on vehicle circulation in the city: functionalist and infrastructure-centred. In the immediate aftermath of the governmental restructuring, he suggests that room was made to allow a set of professionals to promote the valorisation of public spaces from a sociological, quality of life perspective and that gave greater consideration for 'embellishment' of urban spaces—reconnecting, in a way, with 19<sup>th</sup> century European urbanistic models (Moritz, 2011). While this initially led to what he terms an 'ad-minima' mode of design and planning that resulted in greater sharing of public spaces between different users (i.e. more space for people, less for cars), use of more noble materials, and conception of public space as a 'stage' for the surrounding built form, by the mid-1990s there were rising questions as to the use/purpose of public space and the lack of architectural ambition in the conception of the spaces themselves.

It is to this phase of planning and design that we owe the contest that produced the Alain Safarti design for the Boulevard de l'Impératrice and the places Albertine, Sainte-Gudule, and Putterie that were studied in the open-space catalogue. It is definitely true, based on my observations, that this project addresses the need for bolder architectural statements in the design of the spaces themselves. The circular structure that was constructed in front of the Gare Centrale, the distinct streetlighting, and to some extent the highly-geometric design of the gardens at the Place Sainte-Gudule. I would argue that this particular project is also indicative of an early presence of landscape thinking. Firstly, the design proposal indicated a strong intention of integrating landscape interventions into a larger system of green spaces that included the gardens of the Mont de Arts and greened links to the Parc de Bruxelles. As well, it embraced the notion of layering the site, most notably at the Place Sainte-Gudule, where the presence of the Jonction tunnel required the pouring of a fresh concrete slab onto which the gardens could be planted. Furthermore, the type of trees, their pruning, and their chalking was intended to reference similarly chalked trees at the Mont des Arts, evoke an orchard-like setting, and create a new way of visually experiencing the cathedral and its parvis. The project was also phased, with an evolution of the design over time, and included a dynamic management plan for the planted elements (IGBE, 2013).

The second model of planning and design of public spaces in Brussels, Moritz (2011) argues, was a shift towards focusing on community uses, public participation, greater consideration for the sociology of public spaces, and the potential for renovated pub-

lic spaces to affect the wider revitalization of neighbourhoods. One of the main institutional drivers of this model of planning and design was the Brussels Region's creation of 'contrat de quartier durable,' a type of community plan that privileges the setting of the agenda for urbanistic projects through consultation and participation of local residents. No early example of this are to be found in the Jonction Nord-Midi site, but a recent contrat de quartier and contrat de renovation urbaine have been devised for the southernmost ends and northernmost ends of the site respectively (Bureau Bas Smets, 2016; ERU Urbanisme & AAC Architecture, 2016). These focus on open spaces that I chose not to include in the open-space catalogue, but that do offer a distinct contrast in their community-focus from the more regionally-minded (or tourist-oriented) sectors at the centre of the Jonction. This second model of planning and design is very much in line with the literature on public spaces as urban catalyst, and the more sociologically-influenced school of thought that was reviewed in chapter 2.

#### CO-EXISTENCE OF MODELS, MOVING PAST THE IMPASS

The most recent mode of public space design and planning in Brussels-still according to Moritz (2011)—has seen the coexistence of the two previous models: a more architecturally ambitious model for spaces of a regional scale or importance and the more sociologically-minded community model for the redevelopment of smaller scale, local spaces. According to decision-makers such as Kristiaan Borret, chief architect of Brussels, this has created a 'perceived deadlock' when attempting to approach larger urbanistic projects (De Block, Lehrer, Danneels, & Notteboom, 2018). One of the proposed solutions, a way of moving past the deadlock, has been to take a 'landscape infused reading' of the city structure, which was first formally articulated with the 'Bruxelles 2040' visioning exercise carried out in 2012 and elaborated upon in a research by design exercise in 2016 framed by landscape architect and urbanist Bas Smets (whose firm is also responsible for the contrat de quartier Jonction masterplan mentioned above). His (and his office's) was one of the three visions put forward in the 'Bruxelles 2040' exercise. It articulates an interpretation of urbanization in the Brussels Region focused on its 'green' (constructed landscapes, hydrography) and its 'grey' landscapes (a 'valley' of infrastructure) as well as topography as organizing elements.

Much of these exercises move beyond the scope of my project, but the 'valley of infrastructure' concept is of specific relevance as it refers, in part, to the Jonction Nord-Midi. This, for one thing, is indicative that in the Brussels case there has been recognition of the infrastructural site as a distinct entity worthy of conceptualizing. It is also evidence of landscape thinking being employed explicitly at a conceptual level. To some extent it has also been operationalized through the involvement of Bureau Bas Smets in ongoing projects—as well as the Jonction Masterplan (previously mentioned) they are also involved at the northern end of the site as designers of the 'Saint-Lazarus Squares' project—and that of the prominent landscape architect (and some-time theorist) Michel Desvigne (for whom, anecdotally, Bas Smets previously worked) on the Place Rogier project. This intervention warrants two more comments before wrapping up this discussion. First, it brings us full circle to the different models of urban space development discussed earlier as Moritz (2011) considers this project an important example of the architecturally ambitious model because of the prominent 66 metre structure designed by Xaveer De Geyter Architects and the otherwise sober design choices that employ noble materials and reduced car space, but otherwise offer little programming.

#### CONCLUSION

The case of the Jonction Nord-Midi infrastructural site will be of value in the latter chapters of this project because it provides a better conceptualized reference, both in the sense that the site has received recognition as such and because there has been much more explicit operationalization of some of the preoccupations that frame this project. Other evidence of this latter fact includes a series of exhibits and attendant conferences organized by CIVA—the architecture, landscape, and urbanism foundation of the Brussels Region—pertaining to the backlash caused by the Jonction Nord-Midi project and other major 20<sup>th</sup> century interventions (Unbuilt Brussels #1 Save/Change the city, 2017), revisiting past approaches for re-intervening in these sites (Unbuilt Brussels #2 (Re)compose the City, 2018), or pushing the 'metropolitan landscape' discussion further in taking a retrospective and projective look at constructed landscapes in the city (Designed Landscapes – Brussels 1775-2020, 2018-2019). Therefore, this case should usefully inform the generative discussion in chapter 6.

#### WORKS CITED

Alonzo, É. (2018). L'Architecture de la voie: Histoire et théories. Marseille: Éditions Parenthèses.

Bral, G. J. (2007). La Cité administrative de l'État. Bruxelles.

Bureau Bas Smets. (2016). Masterplan Jonction.

Contesse, A. (2018). Unbuilt Brussels #2 (Re)compose the city: dossier de presse. Bruxelles.

- Culot, M., Pesztat, Y., & Vandenbreeden, J. (2017). *Unbuilt Brussels #1 Save/Change the city*. Bruxelles.
- De Block, G., Lehrer, N., Danneels, K., & Notteboom, B. (2018). Metropolitan Landscapes? Grappling with the urban in landscape design. *Spool*, *5*(1), 81–94. https://doi.org/10.7480/ spool.2018.1.1942
- Deligne, C. (2004). La ville vue du train: Bruxelles dans les débats relatifs à la Jonction (1900-1960). In S. Jaumain & F. Boquet (Eds.), Bruxelles et la Jonction Nord-Midi : histoire, architecture et mobilité urbaine (pp. 69–80). Bruxelles: Archives de la ville de Bruxelles.
- ERU Urbanisme, & AAC Architecture. (2016). *Botanique-Jonction-Nord: Situation existante objectifs et priorités*.
- Hennaut, E., & Benedetti, U. W. (2018). *Designed Landscapes Brussels* 1775-2020: dossier de *presse*. Bruxelles.
- IGBE Institut Bruxellois pour la gestion de l'environnement. (2013). Le Jardin de la cathédrale: info fiches-espaces verts. Bruxelles. https://doi.org/10.3917/deba.027.0152
- Jaumain, S., & Boquet, F. (Eds.). (2004). *Bruxelles et la Jonction Nord-Midi : histoire, architecture et mobilité urbaine*. Bruxelles: Archives de la ville de Bruxelles.
- Loeckx, A., Corijn, E., Persyn, F., Avissar, I., Smets, B., Mabilde, J., & Vanempten, E. (2016). *Metropolitan Landscapes: Espace ouvert, base de développement urbain*. Bruxelles.
- Martiny, V.-G. (1976). Une Ville qui se cherche un visage de capital (XIXe-XXe siècles). In M. Martens (Ed.), *Histoire de Bruxelles* (pp. 271–300). Toulouse: Edouard Privat, Éditeur.
- Moritz, B. (2011). Designing and developing public spaces in Brussels. Brussels Studies: La Revue Scientifique Électronique Pour Les Recherches Sur Bruxelles/Het Elektronisch Wetenschappelijk Tijdschrift Voor Onderzoek over Brussel/The e-Journal for Academic Research on Brussels, Collection(50), 0–16.
- Nilsen, M. (2008). Railways and the Western European Capitals: Studies of Implantation in London, Paris, Berlin, and Brussels (Vol. 136). New York: Palgrave Macmillan.
- Région de Bruxelles-Capitale. (2012). Bruxelles 2040, Trois visions pour une métropole.
- Sylvestre, M. (2004). Les premiers projets de Jonction Nord-Midi (1855-1865). In S. Jaumain & F. Boquet (Eds.), *Bruxelles et la Jonction Nord-Midi : histoire, architecture et mobilité urbaine* (pp. 53–68). Bruxelles: Archives de la ville de Bruxelles.
- Wiener, L. (1912). Les Chemins de fer de la banlieue de Bruxelles et la Jonction Nord-Midi. *Revue Générale Des Chemins de Fer, septembre*, 149–158.



# 5 MOUNT-ROYALTUNNEL MONTRÉAL

#### INTRODUCTION

This chapter is concerned with the second of the two cases studied for this project. Similar to the previous chapter about the Jonction Nord-Midi, this chapter will consist of an analysis of the Mount-Royal Tunnel infrastructural space in four sections: a brief history, a site analysis, a descriptive catalogue of its open spaces, and a discussion. Again, as in the previous case study, I will make use of the 'Mount-Royal Tunnel' to refer to the entirety of the urban spaces that sit above the infrastructure itself between the McGill University campus in the west and where the rail lines turn due south in the east, just before they cross the Lachine Canal. Whereas the primary purpose of the Brussels case was to serve as a referent, this chapter aims to document the construction and evolution of the Mount-Royal Tunnel infrastructural space in a way that sets the stage for producing generalizable strategies, especially in light of the most recent and ongoing interventions in this infrastructural space: the layering of the Réseau Express Métropolitain (REM) onto the existing rail corridor and the redevelopment plans for Avenue McGill College, rue Sainte-Catherine Street, and Place Ville-Marie in coordination with the construction of a station of the REM.

#### **BRIEF HISTORY**

In the era before trains and other major transportation infrastructure were publicly provisioned, private railway companies in Canada were locked in an intense state of competition in order to provide long-distance travel with convenient accesses to their network in what were already dense urban centres. In 1912, the Canadian Northern Railway (CNoR) launched a scheme to catch up with its main competitors, the Grand Trunk Railway (GTR) and the Canadian Pacific Railway (CPR), by constructing a Montréal terminal to its transcontinental line in downtown Montréal. The maturity of urban form since the construction of the GTR and CPR terminal lines as well as Mount-Royal itself forced the CNoR to build a below-grade line; as a tunnel below the mountain, in a trench downtown, and as an elevated rail line at its eastern end (Clegg, 2008, pp. 7–9). The owners of the CNoR moved to incorporate the Town of Mount Royal, on land they had acquired at the northern tunnel exit, before any lots had been sold nor the tunnel been built (Clegg, 2008, pp. 14–18). Infamously marketed as the 'model city,' the success of the Town of Mount Royal was dependent on its direct rail link to the centre of Montréal and represented fine profits for the CNoR and its financiers. At the southern end of the tunnel was planned even more grandiose development, dubbed 'Tunnel and Terminal.' The idea was to use the air rights above the rail line to construct four massive buildings each occupying an entire city block that would bring together multiple uses such hotels, offices, commercial space, and of course a central station—the preliminary design for which was created by the same architects as New York's Grand Central Terminal, no less (Cha, Gauthier, & Hederer, 2017, p. 59).

#### INITIAL PROJECTS

The first act in the deployment of infrastructure and the development of urban spaces along the Mount Royal Tunnel corridor demonstrates a very typical institutional regime for the time. The main financiers, Sirs William Mackenzie and Donald Mann, were also the main decision-makers and were very much embedded in pre-existing coalitions of power. Mann had prior experience at a high-level within the CPR, while Mackenzie was a local politician in Toronto and part-owner of that city's streetcar system, amongst others (Fleming, 2015; Regehr, 2015). Their financial backing came in part from international markets, including the French-British-American bank Lazard Frères after which the CNoR's new Montréal yards were named and which still exists as a bank today (Clegg, 2008, p. 14). The need for a third transcontinental rail line was government-mandated and the House of Commons itself promulgated the incorporation of the 'Canadian Northern Tunnel and Terminal Company Limited' as well as letters patent for all elements construction, declaring both to be for the 'general advantage of Canada' (Clegg, 2008, p. 21).

Unfortunately for the CNoR, by 1918 it had overextended itself financially and, nearing bankruptcy, was taken over by the federal government in 1923 to form the basis of the Canadian National Railway (CN) along with a nationalized GTR and other smaller rail lines. Public ownership allowed for a rationalization of services, train stations, and railroad offices within the city of Montréal, with all but the CPR's services relocated to Central Station as well as eventually all offices (Marsan, 2016, p. 424). However, it did not seem to fundamentally alter the growth coalition already in place. The CNoR's original 'Tunnel and Terminal' scheme was not completed, but the CN in the course of the 1920s commissioned similar plans to build out the air rights above what was then a rail trench, the Central Station site, and the lower half of McGill College Avenue from which it could reap the real estate benefits. Much like the original scheme was cancelled due to bankruptcy and the First World War, these other plans never quite came to fruition due to the Great Depression, the dismissal of the CN's first president, Henry Thornton, and beginning of the Second World War (Cha et al., 2017; Clegg, 2008, p. 33; Marsan, 2016, p. 424). Instead, in 1938, the plan was reduced to the bare essentials and the construction of the contemporary Central Station approached completion in 1943.

#### POST-WAR PLANS TAKE SHAPE

The next significant phase came in the late 1940s and early 1950s when the city began getting much more overtly involved in decision making about the future of the CN's downtown lands. They produced plans that responded to the continued efforts by the CN to develop its lands under its own vision. Indeed, after decades without significant construction occurring, the CN was moving quickly to construct some landmark buildings immediately adjacent to and above the Central Station, including the headquarters of the International Civil Aviation Organization (OACI)(1949), the Queen Elizabeth Hotel (1958), and the Terminal Tower (1966). The City of Montréal commissioned a 'plan directeur' from French architect and urbanist Jacques Gréber (famous for his plan for Ottawa) that, while it would not be implemented, would leave some important principles behind in terms of regulating the built form of future development in the McGill College Avenue axis (Cha et al., 2017, p. 111; Marsan, 2016, p. 425). In 1966, the Bonaventure Expressway was built as an elevated viaduct parallel to the elevated train tracks at the eastern end of the infrastructural site. Whereas some effort had been made to integrate the railroad structure into existing fabrics—the viaduct was constructed with usable ground-level spaces and interrupted none of the transverse streets—the 'doubling up' of infrastructure and the decline of Griffintown (just to the south) had significant and lasting urbanistic impacts on this part of the site.

In the Post-War period up to the late 1960s or early 1970s the CN was more receptive





to municipal intentions and showed a willingness to compromise and provide certain public amenities rather than simply maximizing its profits from development. One great example of this is the public plaza at Place Ville-Marie). The placement of a public plaza here, with monumental views onto the mountain along the avenue, was one of the recommendations that stuck from the Gréber plan for the City of Montréal. Despite the plan not being a legal instrument, the CN nevertheless adopted the recommendation in its latest plans and insisted on the creation of the public plaza when the site identified by Gréber was developed (Cha et al., 2017, p. 113).

#### AMBITIOUS PROJECTS, EVENTUAL OPPOSITION

The project of Place Ville-Marie in the form we know today was not initiated by the CN or another public authority but was proposed to the CN by a New York developer William Zeckendorf. From the beginning it was more akin to a speculative public-private partnership than to a rational planning exercise. The land on which the complex was constructed was not sold to the developer, but granted to them through an emphyteutic lease, while ownership remained with the CN (Cha et al., 2017, p. 127). The city took care of widening McGill College Avenue from Sherbrooke Street to St-Catherine Street, where it was planned to meet a pedestrian ramp coming down from the Place Ville-Marie plaza. The speculative nature of the project is evidenced by the difficulty with which tenants for the massive building were found. Only through last-ditch efforts were the two main tenants secured; the Royal Bank of Canada by personal appeal to its director from Zeckendorf, and Alcan by promising its executives that the tower's cladding would be aluminium (Cha et al., 2017, p. 133). Finally, it is also worth noting that part of the speculative nature of the project comes from its unprecedented mix of uses; it was the first office tower in Montréal to also include vast shopping galleries and the beginnings of an underground pedestrian circulation network (Marsan, 2016, pp. 429–430).

Private development projects were the norm for the next two decades, though relatively little of what was planned actually got built (perhaps a reflection on the increasingly extravagant nature of the projects). Other speculative public-private projects over the CN rail line downtown that were in fact constructed include Place Bonaventure (built 1964-1967), at the time the largest building by floor area in the world, Les Terasses (now part of the Eaton Centre) and the Place Mercantile (Marsan, 2016, p. 499). One of the final projects to be put forward during this period was from Cadillac Fairview (then still a fully private developer) in 1984. This proposal especially appears to have been typical of what Harvey (1989) describes as the focus on the 'political economy of place rather than of territory' as it proposed nothing less than a symphonic orchestra hall, 200 stores, and, critically, proposed appropriating McGill College Avenue itself by constructing an indoor pedestrian structure to link properties on either side of the avenue. According to Marsan (2016, p. 501), the opposition this generated from a cross-cutting coalition, which included such different actors as the Chamber of Commerce and Heritage Montréal, represents a turning point in planning and development in Montréal. Most especially, a recognition of the value to urban and social life in keeping the avenue fully open was put forward. One of the most concrete institutional changes that occurred to address public concerns was the introduction of an urban design committee to oversee the project and ensure public interest was better served than in the original proposal from Cadillac Fairview (Cha et al., 2017, p. 217).







1990

1977

#### MONTRÉAL CONTEXT TODAY

Since the 1980s, Montréal in general has been typical of wider shifts in urban governance. Notably, Montréal has continued to promote urban revitalization schemes that would gain it international noteworthiness or attract tourists and workers. No project better illustrates this than the Quartier des Spectacles, which by betting on renovated public spaces, cultural institutions as anchors, private real estate development on its edges, and an appeal to 'creatives' is emblamatic of many contemporary governance discourses (Luka, Gendron, Cudmore, & Mikadze, 2015). One of the recent (and still ongoing) interventions on McGill College Avenue very much inscribes itself in this same vein of trying to rejuvenate the space such that it can contribute to Montréal's ability to compete internationally for 'foot traffic.' Indeed, Montréal mayor Valérie Plante has stated that 'we want to make sure this place is in all the tourist books' ("City plans to turn Mc-Gill College into public plaza," 2018). The Montréal Chamber of Commerce, in a memoir deposited in advance of public consultations on the redesign of McGill College Avenue, went so far as to say it was a key component in the revitalisation of the entire downtown and proclaiming this to be the most significant urban revitalization projects since the Place des Festivals (part of the Quartier des Spectacles PPU) (La Chambre de commerce du Montréal Métropolitain, 2018).

At the same time, other elements of change along McGill College Avenue are emblematic of a distinctly contemporary urban design and planning processes: the lead-role taken by public pension funds in processes of urbanization. Two different subsidiaries of Quebec's Caisse de dépot et placement (CDPQ) are active in reshaping the area: Ivanhoé Cambridge, in relatively minor intervention, is finally improving the pedestrian link between the Place Ville-Marie plaza (which it owns) and St-Catherine Street, while CDPQ Infra has just begun the construction of a new McGill station for its privately-owned REM transit network. Both projects are in many ways essential to the success of the future redesign of McGill College Avenue and, in the case of the REM station, one could say they are even catalysts for the redesign to take place. Such financial institutions intervening directly in infrastructure and public spaces is peculiar and perhaps represents a novel form of financialization of urbanization processes. Nowhere is ongoing financialization clearer in the context of this project than the transformation of the federal government's contribution to the REM from traditional funding to a loan from its new infrastructure bank (Canada Infrastructure Bank, 2018). What is certain is that this new form of governance brings with it all sorts of questions of legitimacy in democratic process, equity, and environmental responsibility (Bisson, 2017).



### SITE ANALYSIS

The site analysis presented here is composed of two parts. The first is a thematic analysis that considers the entirety of the Mount-Royal Tunnel infrastructural space as I identified it in the beginning of this chapter. The four themes are the following: biophysical context, morphological features, transport infrastructure networks, underground pedestrian networks, and building uses. As in the previous chapter, the basis for these analyses is a figure-ground plan of the site. The buildings that have been identified as within the site are depicted as *poché* while the rest of buildings are shown with a pale grey outline for context and comparison. Again, all buildings immediately adjacent to or above the alignment of the underground rail junction have been included as well as an additional block of buildings beyond these. The figure-ground has then been overlaid on other layers of information for each theme. The data for these maps was mostly drawn from the City of Montréal and the Province of Quebec's open data portal (more details on the provenance of data is given in the analysis text, as necessary).

The second part of the analysis is the open-space catalogue, which includes a variation of a figure-ground plans for each of the identified spaces. These depict green space in black, pedestrian space in dark grey, buildings in pale grey, and all other spaces in white. Of the seven open spaces identified, two additionally have 3D representations, and all are illustrated with accompanying photographs. More details on my approach will be given in the introduction to that section of this chapter.


## **BIOPHYSICAL SITUATION**

The outstanding biophysical feature of the site and its vicinity is obviously Mount Royal (just off of the main map, but visible in the context map, above right). As we saw in the history section of this chapter, the presence of the mountain is the major reason that the rail line was built as a tunnel as opposed to the other rail lines that were built downtown, visible on page 65. In theory, because of this slope, views would be afforded by being further up, north-west, within the site and looking down, however, the most buildings prevent this from being possible. Instead, the most interesting (and in some cases protected) views are in the opposite direction towards Mount Royal.

The infrastructural site is mostly aligned in the direction of the slope between Mount Royal and the shore of Montréal Island, and hence mostly perpendicular to the contours as can be seen above. The alignment of the Mount-Royal rail line also roughly follows the course of a few small or intermittent brooks and springs, most notably the ruisseau Burnside, that historically flowed off of the mountain and into the ruisseau de la rue Sainte-Catherine. At its south-eastern end, the site is also crossed by the now-channelized petite rivière Saint-Pierre.

#### FIGURE-GROUND OF THE MOUNT-ROYAL TUNNEL IN MONTRÉAL



## MORPHOLOGY

The grain of buildings within the site is comparable, if somewhat coarser, than that of the fabrics outside of the site. While there are some notably large building footprints within the site, other sizable buildings can be seen not too far from the site. In general, the heterogeneity of footprint dimensions found across Montréal's downtown area is equally represented in the site. One difference is that the arrangement of voids-mostly streets-is much less continuous within the site than in the surrounding area. East-west streets (according to Montréal orientation) are almost entirely uninterrupted, but there are significantly fewer north-south streets. The east-west streets in the site also tend to be better framed by buildings (tighter, more consistent placement) than the north-south streets, particularly in the south-eastern end of the site. Based on these relationships between fills and voids, it is possible to identify four main sectors within the site: 1) McGill University campus 2) the buildings and spaces between Sherbrooke Street and René Lévesque Boulevard that have a dominant north-south axis in McGill College Avenue 3) a central sector dominated by the massive building ensembles built above the rail junction and an asymmetrically located major axis in Robert-Bourassa Boulevard and 4) the remaining buildings and spaces in the site in which various voids are more prominent than the fills. The park that replaces the elevated autoroute Bonaventure is the main void in this latter sector, but vacant lots, parking lots, and other infrastructural voids (from the autoroute 720). This and René Lévesque are the most important obstacles to crossing the site in its longitudinal profile.



#### INFRASTRUCTURES

The Mount-Royal Tunnel infrastructural site is at the nexus of many infrastructure networks as this and the next sub-section will make clear. It is of course by design at the centre of the mainline (heavy) rail network in Montréal and particularly so for regional passenger rail. It is also includes many important components of Montréal's metro network. As can be seen above, there is a relatively higher density of metro stations in the site (the spacing between Peel + Mc-Gill stations and between Bonaventure + Square Victoria OACI stations is tighter than between the other stations above).

The bus network is spatially concentrated in downtown Montréal (and the rest of the island), but much like the two metro lines there are far more east-west links than north-south ones. No single bus line crosses the site fully in its longitudinal dimension while upwards of nine do so transversally. In terms of passenger rail, the only station is Gare Centrale, though Lucien L'Allier is nearby. With the implementation of the REM there will be three new transit stations in the site, interconnecting with the green and orange metro lines respectively at McGill and Bonaventure and an entirely new transit location at Peel Basin (which may or may not be just outside of the site area depending on its final location). This is likely to strengthen north-south transit connections and turn the rail junction into an infrastructural system and space more akin to that of the metro lines.



## UNDERGROUND NETWORK

A particularity of the Montréal case is the extensiveness of the underground pedestrian network that spreads throughout its downtown area. The vector shapes of the underground network were extracted from PDF maps published by the Société des Transport de Montréal and scaled to match the figure-ground plan. As is obvious from the graphic above, the underground pedestrian network—branded as RESO—has a much more north-south orientation than the other networks analysed on the previous page. In fact, the RESO's 'dorsal spine' extends along the centre of the Mount-Royal Tunnel infrastructural site. The network has a very diffused spatial pattern, and any attempt to traverse it in any direction would involve significant detours. Nevertheless, the presence of this network is important to keep in mind when thinking about circulation within the site, particularly given the large retail offering that is located in the network's passageways or that it directly connects to, as well as office space. It is notable that the RESO tends to spread underneath those buildings or building complexes that have the largest footprints. As well, with regards to the infrastructural site, the RESO abruptly ends south of the Bonaventure station/Gare Centrale area. METRO STATION

RESO



## BUILDING USES

The above classification of building uses is the result of a rapid survey using online map applications (i.e. Google Maps and Google Earth) to determine tenant types, etc. In some cases additional web-research was carried out as well. This means that the map above is somewhat tentative; while it may include errors, it should nevertheless give a representative account of the building uses present in the site area. For consistency and comparability, the same categories were used as in the Brussels case. The major takeaway is that not only do the buildings in the site tend to be quite monofunctional in use, but so are blocks and whole sections of the site. Building uses are predominantly office or commercial space. This map probably underrepresents commercial uses, since a lot of ground-level retail is present in the area and even more so in the RESO, as previously mentioned. However, research I carried out in a past project showed that commercial offering in this part of the city tends to close earlier and open later than in other parts of the city, and tend to follow office operating hours. It is also notable that there are very little residential uses in the site area, except in the south-eastern end. In any case, no buildings feature a particularly high mix of uses.

## **OPEN-SPACE CATALOGUE**

There were relatively fewer spaces to select for study in this case study than in the Brussels case and there was a relatively weaker toponymy for spaces, which made identifying them slightly more difficult. Instead, the spaces were selected according to three different logics: any parks or official public spaces within the site (e.g. Place Monseigneur Charbonneau), any 'landscaped' streets (e.g. McGill College Ave, Robert-Bourassa), or under-capitalized open spaces immediately adjacent to the rail infrastructure or major public uses (e.g. rue Belmont, vacant/parking lots).

The plan views, like those in the site analysis section, were taken from cartographic AutoCAD files accessible on the City of Montréal's open data portal, and which I stitched together. Additionally, details of some of the spaces were traced from satellite imagery that were more recent than the cartographic plans, or which allowed a greater level of detail regarding planted areas and pathways. The two 3D visualizations that are included are from CityGML data formatted as Rhinoceros files. I was able to convert these to SketchUp models and export 2D views that roughly match the style of those created for the Brussels open space catalogue. As before, I have attempted to select the best photographs out of a set of over two hundred—shot intuitively during 'urban traverses'—that best represent the spaces. One thing to note is that compared to the climatic conditions in Brussels, the photographs from Montréal present decidedly more wintry scenes. While it is important to consider the quality of spaces in all seasons (and Montréal does pride itself in its Winter City status), I attempted to go out on days of fair weather to try and do justice to the spaces.



## MCGILL UNIVERSITY LOWER CAMPUS

The lower campus of McGill University is one of the oldest open spaces within the site, even as its form has evolved over time. The most significant recent changes have made this entire part of the campus into an overlly shared space. In some cases, this has taken the form of barriers preventing vehicle access, such as the Roddick Gates, but for the most part the form and materials of the roadways that cross the space have been left unchanged. The landscaping of this space is rooted in the English garden and collegiate-styles prominent in the late 19th century across North America. There are mature plantings and various gradients of slope. It has the advantage of being in harmony with Mount Royal Park on the mountain behind it. Its primary function, as I have classified it, is to act as a filter both between the city and the university campus, and between the academic buildings that line all but one of its edges. As such, during the day it is the site of much back and forth movement. Despite this, its not entirely clear that the space has been designed with these circulatory patterns in mind.

AREA G 33,000 m <sup>2</sup> N 22,100 m <sup>2</sup>	CONNECTIVITY A 11 F 4
TYPOLOGY FM GARDEN FN FILTER	INTERVENTION Y - D - C -
USES PUBLIC	







## MCGILL COLLEGE AVENUE

McGill College Avenue features wider than average sidewalks that, in the warmer months, includes large square plinths with floral arrangements and has a median planted with trees. Some of these are quite mature trees, but are neither particularly tall nor have a particularly dense foliage. It is lined on either side by buildings that tend to be in the range of six to twenty or more stories, which lends the space a consistent frame, but also causes it to be almost constantly shaded (not helped by its northwest to southeast orientation). In its current configuration, almost half of the space is dedicated to vehicles, even though it does not connect to another north-south axis at either end. While it possesses a distinctive style of street-lighting—a remnant of its last major redesign in the 1980s—it has almost no outdoor seating (other than private terraces, concentrated at its southeastern end). The view it affords on Mont Royal is prized, but in the other direction views end on the facade of the Oueen Elizabeth Hotel, visible above the esplanade of Place Ville-Marie. The famous architectural landmark itself is barely visible, despite its proximity, because of the presence of other tall buildings.





<b>AREA</b>	CONNECTIVITY
<b>G</b> 14,000 m <sup>2</sup>	A 19
<b>N</b> 7,200 m <sup>2</sup>	F 5
TYPOLOGY FM THIN FN CONDUIT	INTERVENTION Y - D - C -

USES OFFICE/ COMMERCIAL







## ESPLANADE DE LA PLACE VILLE-MARIE

The 3D view depicted above shows the location and number of new trees based on preliminary renderings for the redesign that is currently under construction (planned to end in autumn 2019). The main change proposed by this intervention is to centralize accesses to the underground network in a single larger, glassed atrium in the middle of the square. Previously, despite numerous modifications over the decades, access to the shopping galleries had been possible at four sunken entrances spaced evenly (in a square pattern) on all sides of the square—a clear reference to the four square podiums of the main tower of Place Ville-Marie. Other than this, the redesign will mostly lead to a renovation of the esplanade's paving materials. More significant are the simultaneous renovations of the gallery spaces and the revamped access from the esplanade down to McGill College Avenue.

<b>AREA</b> <b>G</b> 6,900 m <sup>2</sup> <b>N</b> 6,900 m <sup>2</sup>	CONNECTIVITY A 5 F 0
TYPOLOGY FM DIA77A	
FN CORPORATE	D SID LEE +
USES OFFICE	

20















## PLACE MONSEIGNEUR CHARBONNEAU

This small space is built in the incidental area between the base of the main tower of Place Ville-Marie and the street grid. Its notable for being one of the only named public spaces within the site. As far as I could surmise, it was most recently redesigned in 2005, at which time a piece of public art by Patrick Coutu, depicting a collection of architectural forms and mineral materials, was also acquired. Its paving materials and detailing are Place Monseigneur Charbonneau has a large number of benches, particularly for its size. This is likely a result of its use as a lunch spot by nearby office workers. It also features a dense canopy of trees. However, it is bordered on two sides by high-traffic roads and on its two other sides is surrounded by Place Ville-Marie's drop-off driveway. This creates a sense that the space is an isolated island amidst much vehicle traffic. In arranging the benches, a clear preference has been given to the least busy of the two roadways, Robert-Bourassa, with the designer accurately surmising that the six lanes of René Lévesque held little visual appeal (no benches face towards it). Place Monseigneur Charbonneau also has the particularity of being a privately-owned public space, being owned by Ivanhoé Cambridge, the real-estate arm of the Caisse de dépots et placements du Québec (CDPQ), which owns Place Ville-Marie.

<b>AREA</b> <b>G</b> 2,100 m <sup>2</sup> <b>N</b> 1,100 m <sup>2</sup>	CONNECTIVITY A 4 F 2
TYPOLOGY	INTERVENTION
FM INCIDENTAL	<b>Y</b> 2005
<b>FN</b> CORPORATE	D -
	С -
USES	
OFFICE	



## RUE BELMONT

Rue Belmont was perhaps not an obvious choice to include in this open space catalogue. Indeed, contrary to the other two roadways included, this one features no landscaping. I chose to include it nonetheless because it is not a regular street in other ways. It essentially serves as a parking lot and service access for the Gare Centrale complex of buildings (also including the Queen Elizabeth Hotel and the CN headquarters), with little to no through traffic. At its southern end, it even has a height-barrier typical of underground parking lots to prevent vehicles over a certain size from entering. As such, it is a street that has more potential for re-purposing than a regular street. It also has some interesting features. For one, it is the only place from which the original exterior of the Gare Centrale is still visible. Its mix of late art deco and elements of international style still constitute a distinct architectural heritage. Many bas reliefs that alternate with double window panes are still present and in decent condition. However, despite being in the middle of a dense block of construction, there are only service entrance to any of the buildings. I have also included as part of this space a perpendicular alley/street, ambiguously named rue E, that connects rue Belmont to rue de la Gauchetière.

<b>AREA</b> <b>G</b> 5,500 m <sup>2</sup> <b>N</b> 0 m <sup>2</sup>	CONNECTIVITY A 6 F 2
TYPOLOGY FM incidental FN -	INTERVENTION Y - D - C -
USES PUBLIC	





## BOULEVARD ROBERT-BOURASSA

The open space I am cataloguing here is in fact only a section of boulevard Robert-Bourassa between boulevard René Lévesque and rue Saint-Jacques. The current design of the space—including the tall, almost sculptural columns along two medians, and the characteristic lampposts—was conceived by Montréal architecture and urban design firm Daoust Lestage as part of their *Plan d'ensemble pour le Quartier International* in 1999-2000. This section of the boulevard therefore shares its identity with the public realm extending in a series of streets and squares to its east. Other elements include more interesting paving for the sidewalks, which are also wider, and a streetscape uncluttered by signage and posts other than selected by designers (adding order and coherence to signage is a common component of Daoust Lestage's work). The northern part of the space as I have delineated it has different design features. It has regular concrete sidewalks that eventually narrow to the width standard for much less important arteries, but has a wider median with trees. Despite its significant width, there is only a single row of trees and there is no possibility for the median to be used as pedestrian space.

<b>AREA</b> <b>G</b> 20,300 m <sup>2</sup> <b>N</b> 5,800 m <sup>2</sup>	CONNECTIVITY A 22 F 6
TYPOLOGY	INTERVENTION
FM THIN	Υ -
FN CONDUIT	D -
	C -
USES	
OFFICE	







## PARC BONAVENTURE

This linear park is the newest open space in the site area. It occupies most of a very large volume of space that had been previously the location of a viaduct for the autoroute Bonaventure. Despite the size of the park and pedestrian spaces (38,800 m<sup>2</sup>) almost half of the total surface area is occupied by nine lanes of traffic and the need to maintain a direct connection to the autoroute Ville-Marie that runs underground perpendicularly to the site. It is difficult to assess the quality of this green space at such an early stage in its maturation. However, it is clear that a lot of effort has been put into trying to establish a purpose for such a large park space. A number of public art pieces/installations have been located placed throughout the park, most notably a pair of tentacular weathered steel viewing platforms near the northern end. There are also panels all along the central path that relate the history and ecological features of the site. In warmer seasons, a continous bench extends along most of length of this central path, alternating between a wood-slat version and high-quality finish concrete (which is covered in snow during the winter, as at the time of visit). Programming also include a children's playground, outdoor workout furniture, fixed lounge chairs, and ping pong tables. To me, the space gave the impression it was struggling to reconcile the maturity of its plantings with the extensive fit-out of furniture as well as its physical scale with the more community-oriented programme.

AREA	CONNECTIVITY
<b>G</b> 69,000 m <sup>2</sup>	A 28
<b>N</b> 38,800 m <sup>2</sup>	<b>F</b> 9
TYPOLOGY	INTERVENTION
FM THIN	<b>Y</b> 2014-2017
<b>FN</b> COMMUNITY/	<b>D</b> VILLE DE
SUTURE	MONTRÉAL

USES

OFFICE/

RESIDENTIAL















## DISCUSSION

The following discussion has a number of objectives. First, it will serve as a synthesis of the history, site analysis, and the open-space catalogue presented in the previous sections of this chapter. It will also allow me to comment more explicitly on the case of the Mount-Royal Tunnel infrastructural site as seen through the main preoccupations that frame this essay—landscape and public space—and the more transversal preoccupations of programme, scale and multi-layered/multi-level cities. Finally, it will also serve as a reference point for the generative discussion that will make up the next chapter, which will in part be based on comparisons between the Brussels and Montréal cases. My approach will be to elaborate on some of the observations that were made in prior sections of this chapter, emphasises common threads between them, as well as to mix in a discussion of recent and ongoing plans, interventions, or projects as appropriate. I will therefore, to various extents, use my preoccupations as lenses through which to further analyse existing conditions, as well as assess the extent to which similar preoccupations appear to have been important considerations in ongoing public and professional discussions with regards to the Montréal case.

## A TIME OF POTENTIAL

As the previous sections should have made clear, especially the discussion of ongoing and future projects noted in the open-space catalogue, the Montréal site is at a time where appetite for urbanistic interventions seems particularly strong amidst the public, municipal institutions, and private actors alike. The City of Montréal showed particular enthusiasm in its approach to the dismantlement of the autoroute Bonaventure viaduct and the high costs of converting it to a vast linear park—their ambition should at least be commended, even as I will have something to add with regards to the specifics of the intervention. As a (semi-)private actor, CDPQ and its real estate and infrastructure subsidiaries, similarly, cannot be faulted for the high levels of investments they are making in their assets within the site. Indeed, they alone are arguably the most dynamic actor with ongoing projects at Place Ville-Marie, renovation of the Queen Elizabeth Hotel, the Eaton Centre, the Complexes des Ailes, the Place Montréal-Trust, and the construction of the REM. The public has also been receptive, as the successful public consultation carried out by the Office de consultation publique de Montréal (OCPM) for McGill College Avenue is evidence of (OCPM, 2019).

Despite this alignment in enthusiasm, though, there is a sense that interventions are proceeding pell-mell rather than being an expression of a coherent urbanistic approach that takes into account the specificities of the Mount-Royal Tunnel infrastructural site—beyond the one implicitly being put forward by the CDPQ in the magnitude of its interventions. Notably, there is little linking the current flurry of interventions to the recent one at the parc Bonaventure, and there appears to be no consideration at all for the spaces in between these two sectors of the site.

## ON THE PRESENCE OF LANDSCAPE THINKING

In short, this is a clear indication that a landscape conceptualization has at most loosely been considered. Or there is, at minimum, little explicit consideration. While on the one hand one could generously read into efforts to recapitalized the underused rail infrastructure (the REM project) a desire to improve connectivity, the lack of coherent plan to reorganize the surface conditions in order to develop 'opportunities for roaming, connecting, interrelating, assembling, and moving' that landscape theorist James Corner argues are an essential treatment of 'horizontality' for landscape urbanists (Corner, 2014, pp. 292–293). Neither do such plans demonstrate strategies for intelligibly 'layering' and 'thickening' the urban surfaces within the site, despite the propitious presence of many different independent layers (physically and metaphorically) in a large part of the site.

It might make sense, for example, from a business perspective for access to the new McGill REM station to be exclusively through the CDPQ's public-private malls, but the refusal to include a direct exterior entrance from a redesigned McGill College Avenue reduces the diversity of ways in which the different composite elements of the site can be connected and experienced. Meanwhile, the design of the Parc Bonaventure, in being constructed with a fully-formed programme, belies prevailing landscape approaches to process as well as flexibility of aesthetics. In other regards, elements of landscape thinking are somewhat more present, notably in some of the mémoires of organisations such as Les Amis de la Montagne and the Association des architectes paysagistes du Québec submitted to the OCPM in its consultation process for the McGill Avenue project, and retained in part in the OCPM's report.

## PRIMACY OF A 'PUBLIC SPACE' LENS

Much more obviously being employed in the context of Montréal is a place-making and public space discourse, with emphasis on carving out pedestrian-friendly places from auto-dominated ones and on creating spaces for cultural and recreational activities. This is most obvious in the Bonaventure (to the extent that such thinking can be coherent with maintaining nine lanes of traffic) and McGill College Avenue cases. In both cases there is a distinct intention to pack as maximal amount of programme into these spaces. While this understandable when you factor in the considerable size of these spaces, their parcelling (still projective in the McGill College Avenue case) into various sub-spaces intended for different uses undermines the possibilities that their size provides. Critically, it also does not recognize the difficulty of making these kinds of places successful in a context of rather monofunctional building uses and absence of housing. With regard to this latter factor, it is true that some recent plans by the Ville-Marie borough sets aside some of the currently vacant or underused (parking lots) spaces alongside the elevated rail line below Gare Centrale for high-rise residential development (Division de l'urbanisme et du développement économique de l'Arrondissement de Ville-Marie & Thiffault, 2015).

## CONCLUSION

The case of the Mount-Royal Tunnel infrastructural site is an interesting one both because of the current flurry of activity that is occurring within it and, paradoxically, because the infrastructural space has yet to really be considered as a distinct site or set of spaces. In line with the premise of this project that such infrastructural sites have tended to be ineffectual urban fabrics, the current quality of the open spaces is definitely below that of other spaces of similar size and location in Montréal. One of the complexities of this site lies in the way it was built up, whereby the experience of the site is bisected by the presence of large buildings directly above the tracks at the Gare Centrale ensemble of buildings and Place Bonaventure. This further makes a conception of the site as a whole difficult. At the same time, it undeniably remains a site inextricably linked to and influenced by the continued presence of the rail infrastructure. The renewing of its function as a regional passenger transit corridor is an opportune moment for its relationship to local fabrics to be better strategized.

## WORKS CITED

- Association des architectes paysagistes du Québec. (2018). *McGill College: une coulée verte piétonnisée*. Montréal, Québec.
- Bisson, B. (2017, January 21). Train électrique: un projet prématuré, selon le BAPE. *La Presse.* Retrieved from https://www.lapresse.ca/actualites/grand-montreal/201701/20/01-5061732train-electrique-un-projet-premature-selon-le-bape.php
- Cha, J., Gauthier, B., & Hederer, C. (2017). Avenue McGill College: Étude de l'évolution architecturale, urbaine et paysagère, Caractérisation identaire de l'avenue McGill College.
- City plans to turn McGill College into public plaza. (2018, August 2). *CBC News*. Retrieved from https://www.cbc.ca/news/canada/montreal/city-plans-to-turn-mcgill-college-into-public-plaza-1.4771905
- Clegg, A. (2008). The Mount Royal Tunnel: Canada's First Subway. Montréal: Railfare \* DC Books.
- Corner, J. (2014). Landscape Urbanism. In J. Corner & A. Hirsch (Eds.), *The Landscape Imagination: Collected Essays of James Corner 1990-2010* (pp. 291–298). New York: Princeton Architectural Press.
- Division de l'urbanisme et du développement économique de l'Arrondissement de Ville-Marie, & Thiffault, A. C. (2015). *Programme particulier d'urbanisme du quartier des gares*. Montréal, Québec.
- Fleming, R. B. (2015). Sir William Mackenzie. Retrieved December 12, 2018, from https://www. thecanadianencyclopedia.ca/en/article/sir-william-mackenzie
- Harvey, D. (1989). From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism. *Geografiska Annaler. Series B, Human Geography*, 71(1), 3. https://doi.org/10.2307/490503
- La Chambre de commerce du Montréal Métropolitain. (2018). *Avenue McGill College : une place urbaine signature.*
- Les Amis de la Montagne. (2018). *Consultation publique portant sur l'avenir de l'avenue mcgill college*. Montréal, Québec.
- Luka, N., Gendron, P.-É., Cudmore, J., & Mikadze, V. (2015). Pour un urbanisme des possibles dans le Quartier des spectacles. In S. Harel, L. Lussier, & J. Thibert (Eds.), *Le Quartier des spectacles et le chantier de l'imaginaire montréalais* (pp. 185–201). Québec, QC: Presses de l'Université Laval.
- Marsan, J.-C. (2016). *Montréal en évolution: quatre siècles d'architecture et d'aménagement* (4e édition). Québec: Presses de l'Université du Québec.
- Office de consultation publique de Montréal. (2019). *Réaménagement de l'avenue McGill College*. Montréal, Québec.
- Regehr, T. D. (2015). Sir Donald Mann. Retrieved December 12, 2018, from https://www.thecanadianencyclopedia.ca/en/article/sir-donald-mann





#### STRATEGY 1

1

1 DEFINED PROJECT BOUND-ARIES.

2 INCLUDE ALL BUILT-FORM IN THE SITE.

**3** OPEN SPACES RECOGNIZED AS A CONTINUOUS SERIES OF SPACES. 2

# 6 DISCUSSION + STRATEGIES

This chapter will build on the discussions that concluded the two preceding chapters. My intention is primarily to describe the four strategies that I have generated based on my analyses of the cases as well as the concepts and preoccupations I have pondered over the course of this project. In describing the strategies, I will continue making reference to specific characteristics of the cases and concepts, but not in any regimented way. I will weave into the description of the strategies some comparisons of the two cases as appropriate, and in this sense revisit some of the most salient lessons the cases have to offer. In addition, for each of the strategies I try to briefly outline how the strategies could be applied to the Montréal case.

## STRATEGIES

## 1 IDENTIFY THE SITE AS SUCH

One thing that emanates from the comparison of the two case studies is the difference in how the site is named and recognized in Brussels compared to Montréal. As I explained in chapter four, use of the 'Jonction Nord-Midi' to refer to more than just the rail junction is commonplace. I suspect that this stronger toponymic relationship between the infrastructure and the urban space(s) around it has to do with the much more striking event that was its construction; partly because it was just the latest in a succession of 'urban surgeries,' partly also because (contrary to Montréal) the structures destroyed were part of a historic urban fabric, and because of the prolonged period of time it occurred over. Regardless, the toponymy has in some sense facilitated the association of the infrastructure-proper with its larger infrastructural space.

This is something that remains to be done in the case of Montréal. I therefore propose that the first strategy for intervening in these kinds of sites is to recognize them as such. As the review of the literature on infrastructure and urbanism in chapter two made clear, there is often some ambiguity as to what kinds of sites and infrastructure proposed design approaches are meant to be applied to. Appropriately identifying and characterizing an infrastructural site is essential and should precede the use of the other strategies proposed in this chapter. The first indicator that a site is one akin to those studied in this project will of course be the presence of a particular kind of infrastructure-massive, regional, dedicated to transport, where an attempt to dissimulate it has been made-below or adjacent to the spaces under consideration. As I did in the introduction chapter, it is also necessary to consider the construction period and long-term impacts of the infrastructure before establishing whether the site has been correctly categorized. As well, consideration to the building uses located within an infrastructural site is important. I had not anticipated that both cases would feature such a large proportion of office buildings nor so many monofunctional buildings when I selected the cases, but this is clearly apparent from the site analyses.

Going beyond mere recognition, the site must be defined in projective terms. For example, in a Montréal planning context this could mean defining the infrastructural site as the subject of a *programme particulier d'urbanisme* (PPU). Or, if the scope of the endeavor is limited to coherently acting on the public open spaces only, a nested-project struc-

ture of sorts could be put in place to make sure that the individual open space projects are components of a greater urbanistic project. In either case it might well be useful to establish a toponym less unwieldy than Mount-Royal Tunnel, CNoR line, or Mount-Royal Tunnel line to refer to the both the infrastructure and its wider urban space of influence.

## 2 PRIORITIZE A COHERENT LONGITUDINAL EXPERIENCE OF THE SITE

There is an understandable tendency to want to 'suture' the urban scars that are infrastructural sites that I would argue is misguided with regards to the kinds of infrastructural sites I have studied. In both of the cases studied, emphasis was placed on either (re) connecting public spaces on either side of the infrastructural space-thereby aiming to reduce the infrastructural space's role as an obstacle—or to establish strong links between individually renovated public spaces in the site with other public spaces outside the site. In the Brussels case, this is most evident in recent exercises that have attempted to create city-wide 'slow ways' that create comfortable routes for pedestrians to move from one significant public space to another. One of the proposals of a recent conceptual exercise, for example, proposed some grand tracés that all focus on east-west trajectories that run transversally to the Jonction Nord-Midi, this despite major efforts in the recent interventions in the Jonction to reduce the amount of space dedicated to vehicles (Corijn et al., 2018). In Montréal, this tendency has manifested itself in how the McGill College Avenue project has been articulated with more specific references to public spaces outside of the Mount-Royal Tunnel site, such as Place des Festivals or the renovation of the rue Sainte-Catherine (which, granted, crosses the site).

Once the site has been recognized as such, as my first strategy proposes, why not tap into the infrastructural spaces' longitudinal potential? While the prioritizing of the flow and network functionalities of infrastructure over the local need for 'free flow' movement at the local level are one of the original sources for their mal-integration, it does not follow that simply reintroducing and weaving surface spaces necessarily means that they while finally fulfill their full potential. Interventions that recreate, in some ways, these conditions might be an important step, but I would argue that in both the Brussels and Montréal cases there is also an opportunity to develop longitudinal flows and experiences that mirror the underground infrastructure at the surface. Might not the real initial flaw of these projects be that they did not sufficiently integrate longitudinal experiences for pedestrians to begin with? In Brussels, this happened by dedicating a majority of surface space to vehicle traffic with little thought to or care given to make sure an equally comfortable way for pedestrians (or cyclists) to travel through the infrastructural site. Still today, the most recent interventions that have focused on linking open spaces within the Jonction Nord-Midi to open spaces outside of it (on either) side have done little to eliminate the discontinuities for someone trying to travel along the Jonction. In Montreal, the construction of (sometimes massive) buildings directly above the Mount-Royal Tunnel has created even less of a sense that it is possible for pedestrians to experience this trajectory of entry into the city core on the surface. For all the value there might be in the public spaces that remain amongst these buildings, such as McGill College Avenue or the recent park created following the demolition of the Bonaventure Expressway, I would argue that their continued placeless-ness results from the fact that the greatest opportunity to connect them to other places-those others within the Mount-Royal Tunnel infrastructural space—has yet to be capitalized on.

Instead, these spaces—old, new, or renovated—depend for their liveliness and attractiveness on their connections to spaces outside of their respective infrastructural spaces, within urban fabrics that were forced to turn away from the rifts the infrastructural site originally created. With decades before any interesting spaces were developed with-



2



#### STRATEGY 2

1 LONGITUDINAL DIMENSION PRIORITIZED.

2 DEVELOP SURFACE ROUTES THROUGH THE SITE .

3 CONSIDER HOW THE ROUTES RELATE TO THE UNDERGROUN NETWORK.

1

in the infrastructural sites, these fabrics and their spaces established stronger connections with other 'surviving' fabrics. As such, it would be to go against the (urban) grain to assume that connections to non-infrastructural sites are more easily and productively established than between different open spaces within the infrastructural sites. These spaces benefit, in a way, from being better attuned to the same 'urban time' and therefore are better disposed to being connected with each other. Once enough spaces of sufficient qualities have been connected within a site, it is more plausible that they will have achieved the sufficient weight, collectively, to reweave stronger ties with peripheral/adjacent fabrics. The open spaces, much like the infrastructure above which they sit, will derive their value and importance from a network effect.

Landscape urbanism's concept of 'horizontality' would here be a particularly useful conceptual reference. In the discussion section of the previous chapter on the Montréal case I already mentioned that few, attractive, or comfortable connections between many of the open spaces in the site. To create such connections, the human-scale concept as it has emerged in the public space discourse would entirely have its place in enacting this strategy as well. The idea of architecturally developing 'ways' in their *profil long* as elaborated upon by Alonzo (2018) would also be useful, as would some of the historical approaches he documents.

## 3 DEVELOP A PROCESS THAT IS COHERENT WITH THE SCALE OF THE SITE

A striking lesson from both case studies is the lack of long-term process that has explicitly applied to the interventions. Of course, I cannot hold it against either case that no process encompassing the entire site exists, since the interventions have yet to be proposed at that scale. However, it is true that some of the (quite large) individual interventions have had little consideration for how they could or should evolve in time. This is less true of some of the interventions in Brussels, in particular the series of interventions stemming from the international competition for the Carrefour de l'Europe, on which I already commented in the discussion section of chapter four. Larger projects in Montréal, though, have lacked this sort of approach, most notably the nearly 39,000 m<sup>2</sup> of park or pedestrian introduced in the Bonaventure redesign. Instead, most of the interventions (including the ones that are yet to be developed) are intended to be 'birthed' fully-formed in terms of both form and programme. The major downside of this is that for significant periods of time—especially for green spaces—the spaces will appear immature, which risks diminishing their ability to be adopted by residents and visitors alike.

With consideration that the first strategy selects the scale of intervention as the whole infrastructural site and the second prioritizes ways of experiencing the site in its longest dimension (and in its near totality), my third strategy seeks to capitalize on the opportunity that this scale of project affords while also recognizing the difficulty of carrying out such large-scaled project in any single action. In this I borrow from both the process discourse as it has been articulated in the landscape urbanist discourse but even more so I borrow from the writings and practice of Michel Desvigne who has explicitly written about the difficulty of designing landscapes for their 'young' phases (Desvigne, 2008, p. 91). In response to his personal distaste for such projects, he has developed an approach that establishes a spatial framework early on in the development of a public space but that is then rather open-ended, allowing the space to 'fill-out' with time. In some cases, Desvigne intentionally designs a sort of landscape 'succession' process in which plantings or designed features purposefully screens elements of the landscape until they have grown to a more mature form. In other cases, he simply does not fully design the landscape until it has had time to evolve, at which points he returns to a project some years after the initial intervention and only then decides where additional ele-





2



#### STRATEGY 3

1 RECENTLY RE-DESIGNED SPACES/MATURE SPACES.

2 SECOND PHASE OF SPACES + NEW BUILDINGS.

3 THIRD PHASE OF SPACES TO LINK WITH THE OTHERS + MORE BUILDINGS.

1

ments such as pathways and furniture should be placed or to recommend changes to the maintenance programme. In yet other cases, particularly on very large projects such as the one he oversaw at Plateau de Saclay, he has used temporary pilot projects to directly test the spatial forms and landscape features he intends to apply to the larger site at a reduced scale—with the additional benefit of an interestingly pedogeological form of design (Desvigne & Imbert, 2018).

In this he is using a 'gardening' approach, as described by Raxworthy (2018), to the design of these spaces. I am conscious that these approaches are aimed at the design of mostly vegetated spaces, which are the minority in both infrastructural site case studies, but the principle resembles that of 'layering' in landscape urbanism inspired by the Koolhaas's winning proposal for Downsview Park or Corner's for Fresh Kills. I would argue that Desvigne's approach has an advantage in that it does not necessarily consider the different stages/layers/successions to be independent and because he places greater emphasis on the aesthetic and programmatic worth of intermediary stages.

Applied to the Montréal case, one could imagine the 'young space' that is the Parc Bonaventure being developed in stages, with new layers of programming applied over time, especially when the areas adjacent to the space have been more fully built-out. One could also imagine that the trees and other major plantings that are likely to be features of the McGill College Avenue redevelopment could be grown in new nurseries created for that purpose either at the Parc Bonaventure or within Mount-Royal Park. This would in the former case emphasize the links between the spaces within the infrastructure site through process and in the latter situation add new meaning to the visual connection that already exists between McGill College Avenue and the mountain. In a sense, it is also a plea to give the open spaces the time to develop some of the passive and active social activities that have been argued are a key benefit of public space in classic texts of that discourse such as Gehl (2011). The 'cramming' of programme into public spaces—such as at Parc Bonaventure—surely indicates a fear that without fixed activities these spaces may never thrive. The problem is that filling them with programme does not guarantee these will be the appropriate activities and at the same time, in occupying so densely a space, precludes the possibility that the space may evolve and adapt to new uses without another significant design intervention.

It may well be appropriate, in defining the infrastructural site a single project as proposed by the first strategy, to also create a role for a 'designer on retainer' that can be responsible for guiding and modifying the public spaces past the initial interventions. The intention (as the next strategy will make clear) would not be to homogenize the spaces, nor to allow the designer to impose a single vision on the infrastructural site. Rather, the designer-on-retainer could act as the site's 'gardener,' aware of the original design intentions behind any interventions but also capable of recognizing the worth (or not) of diversions from these intentions over time, cultivating what works and, if necessary, also 'pruning' what does not. Such a role of designer-as-advisor has been proposed by Smets (Kagner, 2013) and would be aligned with the vision of the urban designer as 'copy editor' put forward in Childs (2010), wherein there is a participation in shaping of interventions without assuming the role of co-author.



#### STRATEGY 4

#### 1

COARSE GRAIN, AT THE SCALE OF THE SITE.

2 PLURALITY OF GRAIN AT THE SCALE OF INDIVIDUAL SITES, RELATING TO THE WHOLE.

## 4 EMPLOY A PLURALISTIC APPROACH THAT CAN RECONCILE THE SCALE OF THE SITE WITH DESIRED DESIGN OUTCOMES

In chapter two I briefly mentioned *The Largest Art: A Measured Manifesto for a Plural Urbanism* (2017) by Brent D. Ryan, a recent publication that puts forward a proposal for a mode of urban design that is centred on three principles: 'eternal change, inevitable incompletion, and flexible fidelity.' Rather than taking a radical approach to his conception of urbanism, Ryan chooses instead to anchor his manifesto in a recognition of cities at they are and of practices that have existed, without due recognition, since such a thing as urbanism was being discussed (and before). The terminology that he employs, especially the use of 'plural' to qualify urbanism, can appear obvious, or even aphoristic. While a different nomenclature may have been more useful, the arguments he puts forward are compelling, and particularly appropriate to the kind of urbanistic site that have been the subject of this study.

His 'plural urbanism' is defined by five dimensions: scale, time, property, agency, and form. The first dimension, scale, recognizes that urban design operations vary at along greater *range* of scales than other fields. With the dimension of time, Ryan explicitly refers to the temporality of execution that the scale of work imposes, but we could also take it to include various modes of urban design that vary in temporality, such as tactical or temporary urbanism. The dimension of property is self-evident; urbanism, at least under the regimes operating in most of North American and Europe, must contend with operating across property boundaries, the rights attached to which are direct limitation on (or enabler of) the opportunity to intervene. Similarly, the multiplicity of agents (or actors) involved in urbanist processes is inversely proportional to the ability to ensure any amount of fidelity in design. Finally, form refers to the physical manifestation of urbanistic intentions, to which urban design's objectives are sometimes reduced.

Now that the cases have been documented, analysed, and discussed strikes me as a highly appropriate approach to guiding interventions on infrastructural sites of the scale we have been discussing. The crux of his manifesto lies in a sort of convergence of strategic and tactical interventions, in which moderate of even humble interventions are used to impart a greater sense of order and design intentionality to a non-unitary site in which large-scale interventions are not necessarily politically, socially, or economically feasible. While infrastructural sites are in some ways more unitary than most, and typically with greater public ownership, it is the scale of potential interventions that is limiting.

This fourth strategy is in a way one that can help operationalize strategies two and three, by providing a framework for how a longitudinal experience can be developed and how it can be made coherent in time. For example, a pluralist approach could focus on establishing a unified design-language for strategically placed furniture, a series of connected public artwork, or even a landscaping trait that is repeated throughout the site, providing familiarity as it is traversed. The interesting thing is that there are arguably existing examples of this kind of approach applied in Montréal, though it was not called such. The previously established Quartier International scheme by Daoust Lestage is arguably a form of plural urbanism.

More so than strategies two and three, this proposal aims to use interventions within infrastructural sites, even the site itself, to in turn affect change on the surrounding form. I have previously discussed the role of an infrastructural site as a 'structure of permanence' or as 'urban artifact' (Smets has likened linear infrastructure to a 'graphic figure' in inteview with Kagner, 2013) which imparts a distinct patter on its context over time. So far, in both of the cases studies this effect has been perceived for the most part negatively. Applying a version of Ryan's plural urbanism, particularly his 'flexible fidelity' principle might be a useful way to eventually capitalize on successful interventions stemming from the other strategies to affect change on surrounding built form. Contrary to the Brussels case, the urban form in the Montréal case is not yet at the same stage of 'maturity,' which implies an opportunity to enact change at something of an intermediate scale, or 'scalia intermedia,' a term favoured by Manuel de Solà Morales (Kagner, 2013; Ryan, 2017).

## WORKS CITED

- Alonzo, É. (2018). *L'Architecture de la voie: Histoire et théories*. Marseille: Éditions Parenthèses.
- Childs, M. C. (2010). A spectrum of urban design roles. *Journal of Urban Design*, 15(1), 1–19. https://doi.org/10.1080/13574800903429357
- Corijn, E., Hubert, M., Hardy, M., Mezoued, A. M., Neuwels, J., Vermeulen, S., ... Verbiest, A. (2018). *Portfolio #2: Zoom in Zoom out on Brussels City Centre*. Bruxelles. Retrieved from http://journals.openedition.org/brussels/1557www
- Desvigne, M. (2008). Intermediate Natures: The Landscapes of Michel Desvigne. Basel, Switzerland: Birkhäuser.
- Desvigne, M., & Imbert, D. (2018). *A landscape inventory: Michel Desvigne Paysagiste* (First edit). San Francisco; Colombus, OH: Applied Research and Design Publishing; Knowlton School, The Ohio State University.
- Gehl, J. (2011). Life between buildings: using public space. Washington, D.C.: Island Press.
- Kagner, K. (2013). Contemporary Infrastructure: An Interview With Marcel Smets. *Scenario 03: Rethinking Infrastructure*. Retrieved from https://scenariojournal.com/article/contemporary-infrastructure-an-interview-with-marcel-smets/
- Raxworthy, J. (2018). Overgrown: practices between landscape architecture & gardening. Cambridge, Massachusetts: The MIT Press.
- Ryan, B. D. (2017). *The Largest Art: A Measured Manifesto for a Plural Urbanism*. Cambridge, Massachusetts: The MIT Press.

## 7 CONCLUSION

## CONCLUSION

This project sought to explore how to improve the experience of spaces on the surface of underground infrastructure sites built in established urban settings. To that end, the project had three main objectives: 1) to review the literature that links infrastructure to urbanism, landscape discourses, and public space/public life discourse, 2) to document the cases of the Jonction Nord-Midi in Brussels and the Mount-Royal Tunnel in Montréal and 3) to provide a generative analysis the outcome of which was generalizable strategies for intervention on similar infrastructural conditions.

More specifically, I first reviewed concepts that have emerged from professional and scholarly discourses to do with infrastructure and urbanism as well as relating to major preoccupations such as landscape and public space/public life. With regards to the land-scape literature, I paid attention to dominant discourses in a North American context and contrasted it with contemporary European perspectives on landscape and urbanism. From the more North American focused landscape urbanism discourse, I took the concepts of horizontality, ground, field, or surface; layering or thickening; and process. From European thinkers and practitioners I borrowed mostly from Michel Desvigne and his horticulaturally-influenced work, most importantly his concept of 'intermediary natures.' The public space/public life discourses provided a critical lens through which to analyse public space provision, notably the fetishization of historicist aesthetics as a means of enabling spaces of consumption. It also allowed for a rapid review of older, seminal texts that were a product of widespread reaction against mid-20<sup>th</sup> century functionalism—of which the type of infrastructure studied in this project were emblematic.

Next, through a combination of research, field visits, and design-oriented analysis I document two infrastructural in Brussels and Montréal. The case of the Jonction Nord-Midi provided a better conceptualized reference, in part because it is a has been the subject of more public and scholarly discussion but also because recent interventions in the site have more explicitly tried to apply theory in their plans and designs. A number of design competitions through the 1990s and 2000s pushed the ambition of interventions in the site, and provided relatively more mature (but still recent) interventions to document. The case of the Mount-Royal Tunnel infrastructural site was most interesting because of the ongoing plans, investments, design competitions, and public consultations. This renewed interest in individual parts of the site, however, contrasts with continued lack of consideration for the site as a whole. At the same time, the inextricable link to and influence of rail infrastructure is only being made clearer by the conversion of the tunnel for the REM transit service.

As I explained in chapter three and in the site analysis and open-space catalogue sections of chapters four and five, my approach consisted of a mixture of research methods. These were drawn from common planning practice as well as from methods ingrained in landscape architectural research and other forms of research by design. While I think that on the whole these methods proved useful, some components proved to be somewhat superfluous in light of the generative discussion of chapter six. For example, the form and function typologies I applied to the different open spaces in each site proved to have little usefulness beyond enriching the documentation of the site. On the other hand, repeated visits to the sites, either improvised or as intentional 'urban traverses,' were critical to establishing a first-hand experience of the existing conditions, especially in the Brussels case. The climatic conditions for the Montréal field work (carried out during the winter season) unfortunately did not provide as interesting an experience, which has no bearing on the inherent qualities of the site.

My final objective in this project was to derive generalizable strategies for intervention in infrastructural conditions similar to the Brussels and Montréal cases. Through research, analysis, and a fair amount of 'gestation,' I proposed four strategies that respond to the existing conditions within the site and that operationalize some of the concepts identified in the literature review. The first strategy focuses on recognizing the particularities of the site and establishing an appropriate project framework from a planning perspective. This is, I think, an important lesson for municipal planners whose responsibility it is to institute the structure of public realm plans and design projects in a Canadian context. The second strategy is aimed at determining what kind of an experience should be prioritized on the surface of infrastructural sites. I propose that of the focus should be on developing a longitudinal experience of the site, and hence is based on linking open spaces in the site together before linking them to spaces outside the site. Again, therein lies a lesson for planners in terms of prioritizing future projects. The third and fourth strategies are process-oriented. The former is concerned with establishing practices that are coherent in time with the physical dimensions of infrastructural sites. As a component of this strategy, I propose creating a planner of designer role that could act as curator, gardener, or copy editor for the site as a whole, responsible for advising the municipal authorities and guiding the series of interventions over time. This contrasts with the current approach in which individual parts of the sites are identified for renovation and are realized as one-time interventions. Finally, the fourth strategy embraces the principles of 'plural urbanism' as defined by Ryan (2017), and in many ways is meant to reinforce and bring coherence to the application of the other three strategies. I deliberately did not focus on the buildings within the site, but it would have been of some interest to develop a strategy that addressed this important aspect of any urban site.

## FURTHER RESEARCH

Due to the brevity of the research period as well as limited resources, the scope of this study has been quite restrained. This leaves many avenues for future research. The most obvious, and perhaps most useful, endeavour would be to carry out a broader review of infrastructural sites that have comparable characteristics to the two cases studied. This would, for one thing, allow for a refinement of the typology sketched out in chapter one. It could also enable a more thorough and systematic diagnostic of the effects of these kind of infrastructural sites on urban conditions. I took for granted, based on public discussions and perceptions (backed up by my own visits to the sites) that these were spaces that are under-performing, but a more rigorous evaluation would help define those issues that future interventions should address. Applying an open -pace catalogue exercise on more would surely provide a rich amount of detail on which to base further work. It would also be valuable to try and identify cases in which either the original infrastructure project was not perceived to have had major shortcomings or those in which recent (or simply subsequent) interventions have been mostly successful in attenuating negative effects. This would provide firmer grounds on which to contrast conceptual approaches or indicate the potential strength of strategies applied.

From a research-for-design perspective, it would be valuable to try and apply the strategies proposed in chapter six to the create of a conceptual design or plan for the Montréal case that engaged, in detail, with the existing conditions of the site. It would be all the more useful to also create a conceptual design or plan for the Brussels case (and any others identified) such that the methods could be 'stress tested' in the specificity of each case. I expect that the strategies would be refined simply from the attempt at concretizing them. Since design is inevitably a representational exercise, I would be curious to try and develop a variety of visual media (or other media) methods that could translate the strategies I proposed into operationalizable instruments beyond the schematic graphics I provided to illustrate them. This in itself could constitute a significant research project; exploring which representation methods are best suited to interventions in infrastructural sites as compared to other kinds of spaces.

## REFERENCES

- Agyeman, J. (2013). *Introducing Just Sustainabilities: Policy, Planning, and Practice*. London: Zed Books.
- Allen, S. (1999). *Points + lines : diagrams and projects for the city* (1st ed.). New York: Princeton Architectural Press.
- Alonzo, É. (2018). L'Architecture de la voie: Histoire et théories. Marseille: Éditions Parenthèses.
- Appleyard, D. (1981). Liveable Streets. Berkeley, California: University of California Press.
- Association des architectes paysagistes du Québec. (2018). *McGill College: une coulée verte piétonnisée*. Montréal, Québec.
- Barnett, J. (2009). The Way We Were, the Way We Are: The Theory and Practice of Designing Cities since 1956. In A. Krieger & W. S. Saunders (Eds.), *Urban Design* (pp. 101–109). Minneapolis, MN: University of Minnesota Press.
- Belanger, P. (2009). Landscape As Infrastructure. *Landscape Journal*, 28(1), 79–95. https://doi.org/10.3368/lj.28.1.79
- Bélanger, P. (2007). Underground landscape: The urbanism and infrastructure of Toronto's downtown pedestrian network. *Tunnelling and Underground Space Technology*, 22(3), 272–292. https://doi.org/10.1016/j.tust.2006.07.005
- Bentley, I., Alcock, A., McGlynn, S., Murrain, P., & Smith, G. (1985). *Responsive Environments: A Manual for Designers*. Oxford: Architectural Press.
- Bergahauser Pont, M., & Haupt, P. (2010). *Spacematrix: Space, Density and Urban Form*. Rotterdam: NAi Publishers.
- Biddulph, M. (2012). The Problem with Thinking about or for Urban Design. *Journal of Urban Design*, 17(1), 1–20. https://doi.org/10.1080/13574809.2011.646251
- Birch, E. L. (2011). From CIAM to CNU. In T. Banerjee & A. Loukaitou-Sideris (Eds.), *Companion to Urban Design* (pp. 9–29). Milton Park, Abingdon, Oxon: Routledge.
- Bisson, B. (2017, January 21). Train électrique: un projet prématuré, selon le BAPE. *La Presse*. Retrieved from https://www.lapresse.ca/actualites/grand-montreal/201701/20/01-5061732train-electrique-un-projet-premature-selon-le-bape.php
- Bonsiepe, G. (2007). The Uneasy Relationship between Design and Design Research. In R. Michel (Ed.), *Design Research Now* (pp. 25–39). Basel: Birkhäuser.
- Bral, G. J. (2007). La Cité administrative de l'État. Bruxelles.
- Bureau Bas Smets. (2016). Masterplan Jonction.
- Calhoun, C. (1992). The Infrastructure of Modernity : Indirect Social Relationships , Information Technology, and Social Integration. In H. Haferkamp & N. J. Smelser (Eds.), *Social Change and Modernity* (pp. 205–236). Berkely, CA: University of California Press. Retrieved from http://ark.cdlip.org/ark:/13030/ft6000078s/
- Carmona, M. (2015). Re-theorising contemporary public space: a new narrative and a new normative. *Journal of Urbanism*, 8(4), 373–405. https://doi.org/10.1080/17549175.2014.909518
- Cerdà, I. (2018). *General theory of urbanization, 1867.* (V. Guallart, Ed.). Barcelona: IAAC Institute for Advanced Architecture of Catalonia; ACTAR Publishers.
- Cha, J., Gauthier, B., & Hederer, C. (2017). Avenue McGill College: Étude de l'évolution architecturale, urbaine et paysagère, Caractérisation identaire de l'avenue McGill College.
- Childs, M. C. (2010). A spectrum of urban design roles. *Journal of Urban Design*, 15(1), 1–19. https://doi.org/10.1080/13574800903429357

- City plans to turn McGill College into public plaza. (2018, August 2). *CBC News*. Retrieved from https://www.cbc.ca/news/canada/montreal/city-plans-to-turn-mcgill-college-into-public-plaza-1.4771905
- Clay, G. (2003). Crossing the American grain with Vesalius, Geddes, and Jackson: the cross section as a learning tool. *Everyday America: Cultural Landscape Studies after JB Jackson*, 109–129.
- Clegg, A. (2008). *The Mount Royal Tunnel: Canada's First Subway*. Montréal: Railfare \* DC Books.
- Contesse, A. (2018). Unbuilt Brussels #2 (Re)compose the city: dossier de presse. Bruxelles.
- Corajoud, M. (1999). Jardins Wilson. AA FIles, 38(38), 3-9.
- Corajoud, M. (2003). Michel Corajoud. Studies in the History of Gardens & Designed Landscapes, 23(2), 130–140. https://doi.org/10.1080/14601176.2003.10435288
- Corijn, E., Hubert, M., Hardy, M., Mezoued, A. M., Neuwels, J., Vermeulen, S., ... Verbiest, A. (2018). *Portfolio #2: Zoom in Zoom out on Brussels City Centre*. Bruxelles. Retrieved from http://journals.openedition.org/brussels/1557www
- Corner, J. (Ed.). (1999). *Recovering Landscape: Essays in Contemporary Landscape Architecture*. New York: Princeton Architectural Press.
- Corner, J. (2014a). Eidetic Operations and the New Landscape. In J. Corner & A. B. Hirsch (Eds.), *The Landscape Imagination: Collected Essays of James Corner 1990-2010* (pp. 241–255). New York: Princeton Architectural Press.
- Corner, J. (2014b). Landscape Urbanism. In J. Corner & A. Hirsch (Eds.), *The Landscape Imagination: Collected Essays of James Corner 1990-2010* (pp. 291–298). New York: Princeton Architectural Press.
- Corner, J., & Hirsch, A. B. (Eds.). (2014). *The Landscape Imagination: Collected Essays of James Corner 1990-2010*. New York: Princeton Architectural Press.
- Culot, M., Pesztat, Y., & Vandenbreeden, J. (2017). *Unbuilt Brussels #1 Save/Change the city*. Bruxelles.
- Cuthbert, A. R. (2006). Theory. In *The Form of Cities: Political Economy and Urban Design* (pp. 9–21). Oxford: Blackwell Publishing Ltd.
- Cuthbert, A. R. (2007). Urban design: Requiem for an era Review and critique of the last 50 years. *Urban Design International*, 12(4), 177–223. https://doi.org/10.1057/palgrave. udi.9000200
- Cuthbert, A. R. (2010). Whose Urban Design? *Journal of Urban Design*, 15(3), 443–448. https://doi.org/10.1080/13574809.2010.487816
- Danneels, K. (2018). Historicizing Ecological Urbanism: Paul Duvigneaud, the Brussels Agglomeration and the influence of ecology on urbanism (1970-2016). *On Reproduction. Re-Imagining the Political Ecology of Urbanism. Urbanism & Urbanization Conference Proceedings.*, (April), 343–356.
- Danneels, K., Notteboom, B., & De Block, G. (2017). The Garden Territory: René Pechère, the Service of the Green Plan and the influence of the German Autobahn on the Belgian Highway Project. *Creation/Reaction. ECLAS Conference 2017. Proceedings*, (January), 389–406.
- De Block, G. (2012). Designing the Nation: The Belgian Railway Project, 1830–1837. *Technology and Culture*, 52(4), 703–732. https://doi.org/10.1353/tech.2011.0145
- De Block, G. (2016). Ecological infrastructure in a critical-historical perspective: From engineering 'social' territory to encoding 'natural' topography. *Environment and Planning A*, *48*(2), 367–390. https://doi.org/10.1177/0308518X15600719
- De Block, G., & De Meulder, B. (2011). Iterative Modernism: The Design Mode of Interwar Engineering in Belgium. *Transfers*, 1(1), 97–126. https://doi.org/10.3167/trans.2011.010106
- De Block, G., Lehrer, N., Danneels, K., & Notteboom, B. (2018). Metropolitan Landscapes? Grappling with the urban in landscape design. *Spool*, *5*(1), 81–94. https://doi.org/10.7480/ spool.2018.1.1942

De Meulder, B., & Shannon, K. (2013). Water Urbanisms East. Zurich: Park Books.

- de Solà-Morales Rubio, I. (1995). Terrain Vague. In C. Davidson (Ed.), *Anyplace* (pp. 118–123). Cambridge, Massachusetts: The MIT Press.
- Déjeant-Pons, M. (2006). The European landscape convention. *Landscape Research*, *31*(4), 363–384. https://doi.org/10.1080/01426390601004343
- Deligne, C. (2004). La ville vue du train: Bruxelles dans les débats relatifs à la Jonction (1900-1960). In S. Jaumain & F. Boquet (Eds.), *Bruxelles et la Jonction Nord-Midi : histoire, architecture et mobilité urbaine* (pp. 69–80). Bruxelles: Archives de la ville de Bruxelles.
- Desimini, J. (2014). From Planned Shrinkage to Formerly Urban: Staking Landscape Architecture's Claim in the Shrinking City Debate. *Landscape Journal*, 33(1).
- Desimini, J., & Waldheim, C. (2016). *Cartographic grounds: projecting the landscape imaginary*. New York: Princeton Architectural Press.
- Desvigne, M. (2008). *Intermediate Natures: The Landscapes of Michel Desvigne*. Basel, Switzerland: Birkhäuser.
- Desvigne, M., & Imbert, D. (2018). *A landscape inventory: Michel Desvigne Paysagiste* (First edit). San Francisco; Colombus, OH: Applied Research and Design Publishing; Knowlton School, The Ohio State University.
- Division de l'urbanisme et du développement économique de l'Arrondissement de Ville-Marie, & Thiffault, A. C. (2015). *Programme particulier d'urbanisme du quartier des gares*. Montréal, Québec.
- Dodson, J. (2017). The Global Infrastructure Turn and Urban Practice. *Urban Policy and Research*, *35*(1), 87–92. https://doi.org/10.1080/08111146.2017.1284036
- ERU Urbanisme, & AAC Architecture. (2016). *Botanique-Jonction-Nord: Situation existante objectifs et priorités*.
- Fishman, R. (2011). The open and the enclosed: shifting paradigms in modern urban design. In A. Loukaitou-Sideris & T. Banerjee (Eds.), *Companion to Urban Design* (pp. 30–40). Milton Park, Abingdon, Oxon: Routledge.
- Fleming, R. B. (2015). Sir William Mackenzie. Retrieved December 12, 2018, from https://www.thecanadianencyclopedia.ca/en/article/sir-william-mackenzie
- Franck, K. A., & Stevens, Q. (2007). *Loose Space : Possibility and Diversity in Urban Life*. London: Routledge. Retrieved from https://proxy.library.mcgill.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=172203&scope=site
- Gandy, M. (2011). Landscape and Infrastructure in the Late-Modern Metropolis. In G. Bridge & S. Watson (Eds.), *The New Blackwell Companion to the City* (pp. 57–65). Chichester, West Sussex, UK: Blackwell Publishing Ltd. https://doi.org/10.1002/9781444395105.ch6
- Gehl, J. (2011). Life between buildings: using public space. Washington, D.C.: Island Press.
- Gehl, J., & Svarre, B. (2013). How to study public life. Washington, D.C.: Island Press.
- Graham, S., & Marvin, S. (2001). Splintering Urbanism: Networked Infrastructures, Technological Mobilities, and the Urban Condition. London and New York: Routledge.
- Hajer, M., & Reijndorp, A. (2001). *In Search of New Public Domain: Analysis and Strategy*. Rotterdam: NAi Publishers.
- Hall, E. T. (1966). The Hidden Dimension. New York: Doubleday.
- Haney, D. (2010). When Modern Was Green: Life and Work of Landscape Architect Leberecht Migge. Milton Park, Abingdon, Oxon: Routledge. Retrieved from http://books.google.com/ books?id=gKIwQAAACAAJ&pgis=1
- Harvey, D. (1989). From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism. *Geografiska Annaler. Series B, Human Geography*, 71(1), 3. https://doi.org/10.2307/490503
- Hebbert, M. (2016). Figure-ground: history and practice of a planning technique. *Town Planning Review*, *8*7(6), 705–728. https://doi.org/10.3828/tpr.2016.44

- Heins, M. (2015). Finding Common Ground Between New Urbanism and Landscape Urbanism. *Journal of Urban Design*, 20(3), 293–302. https://doi.org/10.1080/13574809.2015.1031002
- Hennaut, E., & Benedetti, U. W. (2018). *Designed Landscapes Brussels 1775-2020: dossier de presse*. Bruxelles.
- Heyde, S. (2018). The Dutch tradition of modernist landscape architecture and the legacy of Hans Warnau (1922–1995). *Studies in the History of Gardens and Designed Landscapes*, *38*(1), 57–72. https://doi.org/10.1080/14601176.2017.1351790
- Hung, Y.-Y., & Aquino, G. (Eds.). (2013). Landscape Infrastructure: Case Studies by SWA, Second and Revised edition. Basel, Switzerland: Birkhäuser.
- IGBE Institut Bruxellois pour la gestion de l'environnement. (2013). Le Jardin de la cathédrale: info fiches-espaces verts. Bruxelles. https://doi.org/10.3917/deba.027.0152
- Ivers, B. C. (Ed.). (2018). Staging Urban Landscapes: The Activation and Curation of Flexible Public Spaces. Basel: Birkhäuser.
- Jacobs, J. (1961). *The Death and Life of Great American Cities* (2011 Moder). New York: Modern Library.
- Jaumain, S., & Boquet, F. (Eds.). (2004). *Bruxelles et la Jonction Nord-Midi : histoire, architecture et mobilité urbaine*. Bruxelles: Archives de la ville de Bruxelles.
- Kagner, K. (2013). Contemporary Infrastructure: An Interview With Marcel Smets. *Scenario 03: Rethinking Infrastructure*. Retrieved from https://scenariojournal.com/article/contemporary-infrastructure-an-interview-with-marcel-smets/
- Krieger, A. (2009). Where and How Does Urban Design Happen? In A. Krieger & W. S. Saunders (Eds.), *Urban Design* (pp. 113–130). Minneapolis, MN: University of Minnesota Press.
- Krieger, M. H. (2004). Taking pictures in the city. *Journal of Planning Education and Research*, 24(2), 213–215. https://doi.org/10.1177/0739456X04271625
- Krieger, M. H. (2011). Media tools for urban design. In T. Banerjee & A. Loukaitou-Sideris (Eds.), *Companion to Urban Design* (pp. 238–248). Milton Park, Abingdon, Oxon: Routledge.
- Kullmann, K. (2011). Thin parks/thick edges: Towards a linear park typology for (post)infrastructural sites. *Journal of Landscape Architecture*, 6(2), 70–81. https://doi.org/10.1080/1862 6033.2011.9723456
- Kullmann, K. (2014). The usefulness of uselessness: Towards a landscape framework for un-activated urban public space. Architectural Theory Review, 19(2), 154–173. https://doi.org/10.1 080/13264826.2014.967330
- La Chambre de commerce du Montréal Métropolitain. (2018). *Avenue McGill College : une place urbaine signature.*
- Lang, J. (2017). *Urban Design: A Typology of Procedures and Products* (2nd ed.). New York: Routledge.
- Lenzholzer, S., Duchhart, I., & Koh, J. (2013). "Research through designing" in landscape architecture. *Landscape and Urban Planning*, 113, 120–127. https://doi.org/10.1016/j.landurbplan.2013.02.003
- Les Amis de la Montagne. (2018). *Consultation publique portant sur l'avenir de l'avenue mcgill college*. Montréal, Québec.
- Loeckx, A., Corijn, E., Persyn, F., Avissar, I., Smets, B., Mabilde, J., & Vanempten, E. (2016). *Metropolitan Landscapes: Espace ouvert, base de développement urbain*. Bruxelles.
- Luka, N., Gendron, P.-É., Cudmore, J., & Mikadze, V. (2015). Pour un urbanisme des possibles dans le Quartier des spectacles. In S. Harel, L. Lussier, & J. Thibert (Eds.), *Le Quartier des spectacles et le chantier de l'imaginaire montréalais* (pp. 185–201). Québec, QC: Presses de l'Université Laval.
- Lukez, P. (2007). Suburban Transformations. New York: Princeton Architectural Press.
- Lynch, K. (1960). The Image of the City. Cambridge, Massachusetts: The MIT Press.
- Madanipour, A. (1997). Ambiguities of urban design. *Town Planning Review*, 68(3), 363. https://doi.org/10.3828/tpr.68.3.2365658h658v0157
- Madanipour, A. (2013). Whose public space? In A. Madanipour (Ed.), Whose Public Space?: International Case Studies in Urban Design and Development. Milton Park, Abingdon, Oxon: Routledge.
- Marsan, J.-C. (2016). *Montréal en évolution: quatre siècles d'architecture et d'aménagement* (4e édition). Québec: Presses de l'Université du Québec.
- Martiny, V.-G. (1976). Une Ville qui se cherche un visage de capital (XIXe-XXe siècles). In M. Martens (Ed.), *Histoire de Bruxelles* (pp. 271–300). Toulouse: Edouard Privat, Éditeur.
- Mcfarlane, C., & Rutherford, J. (2008). Political infrastructures: Governing and experiencing the fabric of the city. *International Journal of Urban and Regional Research*, 32(2), 363–374. https://doi.org/10.1111/j.1468-2427.2008.00792.x
- Moritz, B. (2011). Designing and developing public spaces in Brussels. *Brussels Studies: La Re*vue Scientifique Électronique Pour Les Recherches Sur Bruxelles/Het Elektronisch Wetenschappelijk Tijdschrift Voor Onderzoek over Brussel/The e-Journal for Academic Research on Brussels, Collection(50), 0–16.
- Mostafavi, M., & Doherty, G. (Eds.). (2016). *Ecological Urbanism* (4th ed.). Zürich, Switzerland: Lars Müller Publishers.
- Mostafavi, M., & Najle, C. (Eds.). (2003). Landscape Urbanism: A Manual for the Machinic Landscape. London: AA Publications.
- Neuman, M., & Smith, S. (2010). City planning and infrastructure: Once and future partners. *Journal of Planning History*, 9(1), 21–42. https://doi.org/10.1177/1538513209355373
- Newman, O. (1973). *Defensible Space: Crime Prevention Through Urban Design*. New York: Collier Books.
- Nijhuis, S., & Jauslin, D. (2015). Urban landscape infrastructures: Designing operative landscape structures for the built environment. *Research In Urbanism Series*, *3*(1), 13–34. https://doi.org/10.7480/rius.3.874
- Nilsen, M. (2008). Railways and the Western European Capitals: Studies of Implantation in London, Paris, Berlin, and Brussels (Vol. 136). New York: Palgrave Macmillan.
- North, A. (2012). Operative Landscapes. Zürich: Birkhäuser.
- Office de consultation publique de Montréal. (2019). *Réaménagement de l'avenue McGill College*. Montréal, Québec.
- Olwig, K. R. (2007). The practice of landscape "conventions" and the just landscape: The case of the European Landscape Convention. *Landscape Research*, *32*(5), 579–594. https://doi.org/10.1080/01426390701552738
- Raxworthy, J. (2018). *Overgrown: practices between landscape architecture & gardening*. Cambridge, Massachusetts: The MIT Press.
- Raxworthy, J., & Blood, J. (2006). *The MESH book : landscape/infrastructure*. Melbourne: RMIT University Press.
- Reed, C., & Lister, N.-M. (Eds.). (2014). *Projective Ecologies*. Cambridge; Barcelona: Havard Graduate School of Design; Actar Publishers.
- Regehr, T. D. (2015). Sir Donald Mann. Retrieved December 12, 2018, from https://www.thecanadianencyclopedia.ca/en/article/sir-donald-mann
- Région de Bruxelles-Capitale. (2012). Bruxelles 2040, Trois visions pour une métropole.
- Robinson, A. (2013). Modulating Infrastructural Flows to Create Open Space. In Y.-Y. Hung & G. Aquino (Eds.), Landscape Infrastructure: Case Studies by SWA, Second and Revised Edition (pp. 36–41). Basel, Switzerland: Birkhäuser.
- Rowley, A. (1994). Definitions of Urban Design: The nature and concerns of urban design. *Planning Practice & Research*, *9*(3), 179–197. https://doi.org/10.1080/02697459408722929
- Ryan, B. D. (2017). *The Largest Art: A Measured Manifesto for a Plural Urbanism*. Cambridge, Massachusetts: The MIT Press.
- Ryckewaert, M. (2011). Building the Economic Backbone of the Belgian Welfare State: Infrastructure, Planning and Architecture 1945-1973. Rotterdam: Uitgeverij 010.

- Schultz, H., & Etteger, R. van. (2017). Walking. In A. van den Brink, D. Bruns, H. Tobi, & S. Bell (Eds.), *Research in Landscape Architecture* (pp. 204–219). Milton Park, Abingdon, Oxon: Routledge.
- Schweitzer, L., & Valenzuela, A. (2004). Environmental injustice and transportation: The claims and the evidence. *Journal of Planning Literature*, *18*(4), 383–398. https://doi.org/10.1177/0885412204262958
- Sease, A. (2015). Landscape (and) urbanism? Engaging Nolli. *Journal of Urbanism*, 8(4), 352–372. https://doi.org/10.1080/17549175.2014.909517
- Shannon, K., & De Meulder, B. (2008). Water Urbanisms. Amsterdam: SUN.
- Shanon, K. (2006). From Theory to Resistance: Landscape Urbanism in Europe. In C. Waldheim (Ed.), *The Landscape Urbanism Reader* (pp. 142–161). New York: Princeton Architectural Press.
- Sitte, C. (1996). L'art de bâtir les villes: l'urbanisme selon ses fondements artistiques. Paris: Éditions du Seuil.
- Smets, M. (2001). The contemporary landscape of Europe's infrastructures. *Lotus International*, 110, 116–125.
- Smets, M., & Shanon, K. (2016). *The Landscape of Contemporary Infrastructure*. Rotterdam: naio10 Publishers.
- Sohn, E. (2007). Organicist concepts of city landscape in German planning after the second World War. *Landscape Research*, *32*(4), 499–523. https://doi. org/10.1080/01426390701449885
- Solà-Morales, M. de. (2008). A Matter of Things. Rotterdam: NAi Publishers.
- Swaffield, S. (2017). Case Studies. In A. van den Brink, D. Bruns, H. Tobi, & S. Bell (Eds.), *Research in Landscape Architecture* (pp. 125–140). Milton Park, Abingdon, Oxon: Routledge.
- Sylvestre, M. (2004). Les premiers projets de Jonction Nord-Midi (1855-1865). In S. Jaumain & F. Boquet (Eds.), *Bruxelles et la Jonction Nord-Midi : histoire, architecture et mobilité urbaine* (pp. 53–68). Bruxelles: Archives de la ville de Bruxelles.
- Tatom, J. (2006). Urban Highways and the Reluctant Public Realm. In C. Waldheim (Ed.), *The Landscape Urbanism Reader* (pp. 180–195). New York: Princeton Architectural Press.
- Thompson, I. H. (2012). Ten Tenets and Six Questions for Landscape Urbanism. *Landscape Research*, *37*(1), 7–26. https://doi.org/10.1080/01426397.2011.632081
- Trancik, R. (1986). Finding Lost Space. New York: Van Nostrand Reinhold Company Inc.
- Van Acker, M. (2010). Re-tracing urban design: Infrastructure as a mode of urban design. In *Urban Design Research: Method and Application*.
- Van Acker, M. (2014). From Flux to Frame: Designing Infrastructure and Shaping Urbanization in Belgium. Leuven: Leuven University Press.
- Van Bohemen, H. D. (1998). Habitat fragmentation, infrastructure and ecological engineering. *Ecological Engineering*, 11(1–4), 199–207. https://doi.org/10.1016/S0925-8574(98)00038-X
- Vanoutrive, T., Van Damme, I., & De Block, G. (2016). On the Rationality of Network Development: the case of the Belgian Motorway Network. *International Planning History Society Proceedings*, 17th IPHS Conference, History-Urbanism-Resilience, TU Delft 17-21 July 2016, 03, 235–246.
- Verma, N. (2011). Urban Design: An incompletely theorized project. In A. Loukaitou-Sideris & T. Banerjee (Eds.), *Companion to Urban Design* (pp. 57–69). Milton Park, Abingdon, Oxon: Routledge.
- Vicenzotti, V. (2017). The Landscape of Landscape Urbanism. Landscape Journal, 36(1), 75–86. https://doi.org/10.3368/lj.36.1.75
- Waldheim, C. (Ed.). (2006). *The Landscape Urbanism Reader*. New York: Princeton Architectural Press.
- Waldheim, C. (2016). *Landscape as Urbanism: A General Theory*. Princeton, NJ: Princeton University Press.

- Weiss, M., & Manfredi, M. A. (2015). *Public Natures: Evolutionary Infrastructures*. New York: Princeton Architectural Press.
- Whyte, W. H. (1980). *The social life of small urban spaces*. Washington, D.C.: Conservation Foundation.
- Wiener, L. (1912). Les Chemins de fer de la banlieue de Bruxelles et la Jonction Nord-Midi. *Revue Générale Des Chemins de Fer, septembre*, 149–158.
- Windsor, D. (1979). A Critique of The costs of sprawl. *Journal of the American Planning Association*, 45(3), 279–292. https://doi.org/10.1080/01944367908976967
- Wolfrum, S. (Ed.). (2015). Squares: Urban Spaces in Europe. Basel, Switzerland: Birkhäuser.

