The Influence of Urban Design Theories in the Transformation of Urban Morphology: Montreal from 1956 to 2018

by François Racine
University of Quebec in Montreal

Keywords: Urban morphology, urban design, planned built environments, schools of thought, Montreal.

Abstract: Research on Canadian urban design, despite some notable exceptions, is relatively limited. This paper explains from an urban form perspective the practice of urban design in Montreal by studying three representative projects built during the past six decades. Through the analysis of these projects, the principal aim is to understand how urban design approaches have evolved over time and how they have influenced the morphology of the city. The main findings of the research show that the schools of thought that have nurtured urban design practices over time have especially influenced the link between planned built environments and city forms.

1. Introduction

The traditional process of formation and transformation of urban form has created layers of urban fabric organized according to simple rules of aggregation. This vernacular process based on construction techniques inherited from past experiences explains the relative equilibrium between homogeneity and diversity that characterizes the urban fabric of a city like Montreal. But what happens when these mechanisms disappear and are replaced by learned practices that are associated with the practice of urban design? Since 1956, i.e. when the concept of urban design was first introduced in North America (Krieger and Saunders, 2009), design practices on the city scale have progressively replaced the traditional typological evolution process and its central role in the formation and transformation of the urban fabric. The urban design projects carried out in the last 60 years on the Island of Montreal can be understood as laboratories of Quebec and Canadian urbanism. The present research focuses on urban design practices in Montreal since 1956 and the influence of these design approaches on the formation and transformation of the urban fabric of the city. In this context, this paper wishes to identify how the production of urban design practice, which is referred to as "planned built environments", has influenced the urban form of Montreal through time. This research is an important means of developing a critical awareness of urban design's impact on the existing fabric of the city.

DOI 10.36158/97888929535679
www.tabedizioni.it

A review of urban design literature and of reports found in the archives of the Planning Department of the City of Montreal (Centre de documentation Marie-Morin) reveals that three major schools of thought have influenced the practice of urban design in the city. The first approach is Modernism. For that movement, planning and architecture are a way to bring about social reform (Le Corbusier, 1923, 1957). The promotors of this school of thought reject the historical city because they judge that it is obsolete and also reject any direct reference to the form of the traditional city. The design emphasis is on pure geometrical forms and the establishing of homogenous landscapes (Banham, 1966). The second approach is Postmodernism (Rossi, 1984; Ellin, 1999; Talen, 1999). It represents a criticism of modernist reductionism and tends to embrace and value diversity (Venturi, 1966). The promotors of this movement favor a return to lost urban traditions, and this is reflected in a rather eclectic design approach. Postmodern urban designers have postulated theories of "how to plan" (Koetter and Rowe, 1979). Finally, the Contemporary approach has as its objective the reconstruction of the city itself. This movement is based on historic knowledge (Panerai, *et al.*, 1999: Oliveira, 2016; Kropf, 2018). The aim of some contemporary urban designers is to reconcile the aesthetic and spatial quality of modern architecture with city form. It is important to note that in Montreal, there is actually a shift to a movement that includes increasing consideration of sustainable development.

2. Theoretical framework

To understand how planned built environments are structured and to study their relationship to urban form, research needs to bridge the gap between the discipline of urban morphology and the practice of urban design (Whitehand, 2017). The definition of a theoretical framework is important to generate categories in which to analyse and compare the three cases studied selected in this article, that are representative of the evolution of urban design approaches in Montreal. These categories must establish uniform criteria to analyse how the projects are organised and to compare them with the same premises to determine their contribution to city form. The subject matter of this research is the morphological system of relationship 'contained' in the material and spatial form of planned built environments. This system is influenced by the ideas that have shaped the practice of urban design throughout history. To study the physical-spatial mode of organisation of planned built environments, the research uses a methodological approach derived from the literature in urban morphology that borrows some concepts from structural analysis that has influenced this discipline as a theoretical structural approach to urban form.

In 1969, M.R.G. Conzen developed a method to study the "town plan". The town plan is composed of the topographical arrangement of the area and is also structured by the street plan that delimits blocks subdivided by private plots. Block-plans and buildings complete the organisation of a specific town plan (Conzen, 1969). Caniggia and Maffei represent the Italian school of typo-morphology that has developed a framework by theorising the constituents of the urban tissue (Caniggia and Maffei, 2001). Depending on its topography, vegetation cover, and hydrography, a specific site is the first condition for generating the aggregation of a specific urban tissue. Linear elements connecting different parts of the site usually appear, i.e. types of routes (matrix, planned, connecting, break-through routes) that constitute the road network linking different nodal points and the polarity of the urban tissue. The land along these routes constitutes the pertinent strips that are divided into plots to host various building types gradually forming the blocks. Usually the plot division adapts to the different building types

composing the traditional urban fabric, mainly residential, resulting from past experiences of adaptation to ever-changing human needs. The notion of typology is used by Caniggia and Maffei to understand regularities in the evolution of building types through time (Devillers, 1974). Lévy has gone further in this theorisation. The urban fabric is made up of the components that Conzen, Caniggia and Maffei have defined, i.e. site, road network, plot subdivision, and types of buildings, but Lévy adds another component in the definition of urban form, namely open spaces. Levy also highlights the role of building layout in the materialisation of urban form. The specific relation of buildings to the site, to the street, to the plot, and to open spaces are key elements in studying and understanding the spatial structure of the urban fabric (Lévy, 1992).

3. Methodology

Figure 1 uses the components of urban fabric to schematize the structure of planned fabric. The basic components of planned fabric include the site (S), the road network (R), the plot subdivision system (P), the built framework (BF), and the network of open spaces (OS) that are shown as interrelated elements in the figure. The figure also presents the importance of building layout, i.e. the relationship between buildings and the site (B/S), between buildings and roads (B/R), between buildings and plots (B/P), and between buildings and open spaces (B/OS), so as to foster an understanding of the formal and spatial structure of any planned built environment. The two directional arrows between the built framework (BF) and the building (B) show a change of scale in the structuring of planned fabric, passing from the general built environment of a planned fabric to a certain category of building type integrated in the fabric, like Russian dolls. Usually planned built environments fall within a context (C) which, by its very nature, is one of the components of an element on a larger scale, i.e. the form of the urban fabric and of the city as a whole. The hypothesis guiding this research is that the organisational concept of planned built environments is dependent on the influences of urban design theories; these schools of thought affect specifically the relationship of planned environments to city form. The description of the case study structure stems from the organisational scheme that highlights the cognitive operations of planned fabric design (Racine, 2016).

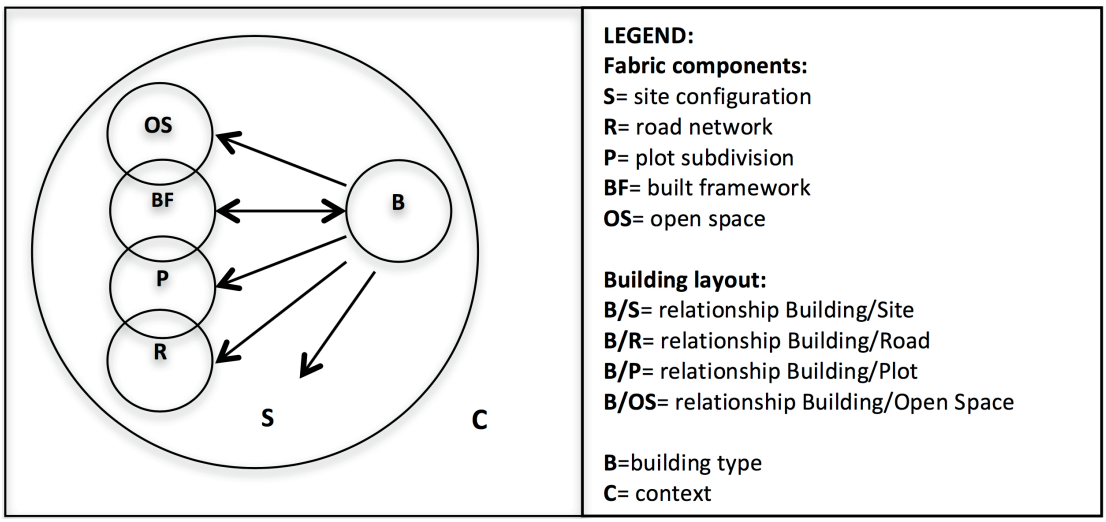

Figure 1. *Synthetic representation of the organisation of planned fabric and its relation to urban form (Racine, 2016).*

The first project studied here is Habitations Boyce-Viau (1969-1971), awarded an honorable mention by the Canadian Housing Design Council. The project was recognised as representative of the first experiences of modern urban design in Montreal (Bergeron, 1989). One of the first postmodernist projects built in Montreal, Quartier Saint-Sulpice (1983-1986) is the second project analysed in this research project. In the 1980s, the project won an architectural and urban design competition and was recognised as representative of the new trend in urban design by the Quebec Order of Architects (OAQ, 1983). Place Valois (2001-2006), awarded a prize for the incorporation of its architecture into the city, is the third project selected for analysis. The approach developed in Place Valois is classified by Marsan as representative of "contemporary urbanism" (Marsan, 2016). The next section presents an analysis of the three projects selected. It summarises how the components and their organisation in the project relate to the morphology of the surrounding urban fabric (*context*) and how the project has transformed the urban form in general.

4. Analysis / Results

4.1. *Habitations Boyce-Viau (1969-1971)*

The Habitations Boyce-Viau project is part of the Myriade I large-scale housing program launched by the City of Montreal in the 1960s. The goal of this municipal program was to build 1,600 housing units on a number of sites located in older Montreal neighbourhoods dating from the 19th and early 20th centuries. The new housing was intended to counter the spread of what authorities deemed to be substandard dwellings, while increasing the affordable housing stock. The City entrusted the program's full implementation and administration to the Office Municipal de l'Habitation de Montréal (OMHM). However, the latter had to comply with the plans and specifications prepared by the City's Service de l'Habitation, which was also in charge of setting out the eligibility criteria for allocation of families to the new subsidised housing. The choice of a contractor and the contractor's architects was made either through competitive tendering or the standard call for tenders (Service de l'Habitation, 1969).

Figure 2. *Physical location of the projects: (A) Habitations Boyce-Viau (1969–71); (B) Quartier Saint-Sulpice (1983–86); and (C) Place Valois (2001–06).*

The project was designed to create a balance by offering units of various sizes so as to reflect the diversity of households in need of relocation. A half hectare of the site had to be reserved for the development of a public playground (Figure 3). The two city blocks located southwest of the intersection of Boyce Street and Viau Street, owned by the City of Montreal, were sold to the Office Municipal d'Habitation de Montréal (OMHM) in 1969. For its contractor, the OMHM chose Secant, the construction company associated with Philip David Bobrow and Michael Fieldman, the architects who won the competition (Service de l'Habitation, 1969).

With a view to ensuring the diversity of households required by the Service de l'Habitation, the architects developed five three-storey apartment complexes, where each floor was accessed via indoor stairways. Each model comprised a range of units, including studio apartments and one to five-bedroom units, the larger ones being on two floors. Household diversity was encouraged by the floor plans, designed to group together units of varying sizes. The grouping of these L-shaped apartment complex models allowed for the definition of an overall plan that included open space for residential use.

The Canadian Housing Design Council awarded an honourable mention to the Habitations Boyce-Viau project "for its socioeconomic provisions and objectives" (Service de l'Habitation, 1971). It recognised the project's quality as being superior "even to some costlier housing projects". Although established according to the free plan principle, the L-shape of the buildings enabled architects to define the layout of open spaces. The outdoor areas defined by this spatial arrangement allowed for the establishing of various semi-public courtyards and a network of pedestrian paths to connect them. These semi-public spaces are situated on concrete slabs, below which is located the parking area. The slabs are adorned with plant troughs and urban furniture. The remaining open spaces are vegetated and include pedestrian paths. The coefficient footprint of the project is 30%, while the density is 95 units per hectare. Despite the high density, "open air spaces seemed sufficient" (Service de l'Habitation, 1971).

Synchronic and diachronic analyses show that the organisation of Habitations Boyce-Viau broke with the urban form system in place at the time of the neighbourhood's creation. The project is characterised by an inward-facing organisation that contrasts with the neighbourhood's typical elongated, rectangular city blocks. The degree of integration of the surrounding urban fabric is affected by the inward orientation of buildings on the site. The apartment complexes cluster around semi-public courtyards that have little contact with the adjacent road network. The playground does not act as a pivot or a meeting point, as originally intended by the designers. On the northern side, a fence makes it impossible to walk from the dwellings to the playground. On the southern side, Hochelaga Street, a wide urban artery, constitutes an additional obstacle to comfortable pedestrian access. This results in a semi-privatisation of the courtyard, the pedestrian path, and the park space defined by designers. Visitors have the impression that they are entering courts and gardens that can be used by residents only. A kind of social control is established between buildings and over semi-public courtyards (Jacobs, 1993). This is not the case for the central courtyard, where the adjacent building walls are generally blind. Finally, it is important to note that the absence of a hierarchy of open spaces makes it difficult for residents to appropriate these open areas.

The functionalist modernist design is expressed in a clean separation between the car traffic level and the vegetated environment of pedestrian paths where the buildings are located. Vehicle access stops at the four exterior visitor parking lots and the underground parking facility located below the semi-public courtyard slabs. The segregation between pedestrian space and vehicle space, relegated to the underground and to the site's periphery, results in pedestrian paths serving the single purpose of allowing residents to access the entrance of their homes.

It should be observed however that the buildings' architectural composition and size may be integrated into existing building types in the neighbourhood. Nevertheless, the hierarchy of building façades differs, the façades overlooking streets being the same as those fronting the semi-public courtyards. The homogenous architectural expression does not help to guide visitors through the site: they cannot distinguish the fronts of buildings, usually public, from the rear, which is typically the more private area in urban environments.

The designers' objective to promote household diversity by mixing unit types was not entirely achieved. The entrances of the collective buildings face either an interior courtyard, a green space, or the sidewalk of an adjacent street, precluding encounters between residents in the same yard serving as a communal space. The implementation of a modernist urban design approach has resulted in an introverted project that is poorly connected to its built environment and its historical context. Isolated from the neighbourhood, the project is showing signs of deterioration due to the aging of its buildings, which need repair. Meanwhile, a reflection on the links between the built ensemble and the adjacent neighbourhood is also in order.

4.2. *Quartier Saint-Sulpice (1983-1986)*

In 1962, Humphrey Carver, director of the committee in charge of housing policy at the Canada Mortgage and Housing Corporation (CMHC), a federal organisation, wrote: "[...] vast stretches of family housing in older districts cannot remain in use unless they become comparable to newer suburbs in terms of street safety [and] the existence of pleasant green spaces [...]" (our translation) (Bergeron, 1989). During the 1980s, the City of Montreal launched Operation 20,000 Homes, aimed at countering the flight of middle-class families to the northern and southern suburbs of Montreal Island. Through this program, the City sought to control the quality of its projects by organising urban design competitions between teams composed of

Figure 3. *Habitations Boyce-Viau (1969-1971).*

developers and architects, on strategic lands owned by the City. The objective was to promote housing types and building ensembles that had the potential to attract families.

A technical committee within the City was composed of planning professionals tasked with reviewing the projects submitted. Integration within the building context, coherence in relation to volumetry, and the positioning of buildings within city blocks were the urban criteria used by the City. The quality of the overall architectural composition was also assessed. Following this technical evaluation, the project was presented to the executive committee for final approval. The City could at this point sell the land to the designated developer as a prelude to the project's launching. The contract stipulated that any change exceeding 10% in relation to the original program required a second assessment by the executive committee.

Under the terms of the competition, the developer was required to put forward a project of a certain degree of architectural quality in order to increase his or her chances of being awarded the site acquisition contract. Starting in the 1980s, this method has enabled a number of architects and urban planners to develop expertise in the design of built ensemble plans. Another spinoff of this type of contract-awarding process is that it is very competitive and hence results in developers proposing quality housing projects. Consequently, they need to work with planning professionals with expertise in urban design. This process has also raised awareness among architects about their project's architectural and urban integration, inasmuch as this criterion is an integral part of the assessment criteria.

The architectural quality of the projects carried out in the context of Operation 20,000 Homes exceeds that of most projects implemented in recent decades by private companies, whose only constraint has been to meet zoning regulation requirements (SHDU, 1988). In 1983, the firm Poirier, Cardinal architectes et urbanistes was awarded the contract for the development of Quartier Saint-Sulpice, located in Domaine André-Grasset. With a view to promoting a diversity of housing types, the ground floor units included part of the half basement space. Top floor units included a mezzanine with an outdoor terrace, a singular component crucial to diversifying Montreal housing types. Walk-up type staircases were installed indoors. The overall project was characterised by a uniform use of cladding materials, namely brick and wood.

In terms of urban fabric, Quartier Saint-Sulpice is designed to establish a relationship between the city blocks that are typical of the south of the project and the residential ensembles found on the northern side (Figure 4). The project was incorporated into a site bordering a busy highway to the south. The street grid was continued on the other side of Autoroute Métropolitaine – an obstacle to the continuity of the urban fabric. Straddling the classic city island and the scenic road network of "garden suburbs", Quartier Saint-Sulpice is characterised by a hybrid system of implantation and services. The overall project met the expectations of Operation 20,000 Homes as regards quality and type diversity. The spatial quality of each housing unit was innovative for its time.

The rows of trees along the streets, the fine definition of dwelling entrances, as well as the presence of a private back garden are testimony to the architects' sensitivity to the morphology and the Montreal housing types. This new sensitivity to local history can be explained by the influence of postmodernist ideologies on Montreal urban designers. Certain architectural elements, such as semicircular arches and brick corbels, also reflect this influence of postmodernist expression in architecture.

Contrary to the architects' wish to include a web of pedestrian paths in the project, similar to those found in garden suburbs, only one footpath was developed within the continuation of a street, close to apartment complex style housing. The intention was partly to discourage transit traffic through these streets. Establishing a local network of streets allows for a controlled

use of the automobile within the residential ensemble. Side streets remain peaceful during off-peak hours. A row of trees separates the sidewalk from roads reserved for vehicles and creates a screen of vegetation between the street and housing units. However, the buildings turn away from the major adjacent avenues and a continuous scree slope blocks the view. In accordance with the functionalist vision, these routes are reserved for fast traffic only.

The overall plan places emphasis on the consistent implanting of basic organisational elements, as defined by the designers, along streets and plots. Side building access to parking allowed designers to develop landscaped street-front entrances. The front setback area features plant life, and stairs provide access to the ground floor, which is slightly higher than ground level. It should be noted that by virtue of the orientation of their vegetation and their position in the overall urban grid, these parks seem to be intended for residents of the adjoining neighbourhoods and are therefore semi-public in nature. This status does not allow for their appropriation by all neighbourhood residents as public spaces. Establishing dwellings near the street has enabled the creation of backyards as a private space available to residents.

The Quartier Saint-Sulpice grid is hybrid in nature, resulting in a sort of collage oscillating between the city blocks located farther south and the more scenic layout of parks and gardens, similar to the garden suburbs that can be found on the outskirts of the Island of Montreal. In this sense, urban designers attempted to offer a built ensemble that is denser than the pavilion environment of the suburbs, while incorporating a quality vegetation frame that differentiates the project from suburban building development setups. Finally, it should be noted that condominium buyers have higher incomes than the average defined by the initial program. However, the objective of the City's Operation 20,000 Homes to attract households back to the city was met, with 85% of households coming from outside the city in 1987 as opposed to 55% in 1983.

Figure 4. *Quartier Saint-Sulpice (1983-1986).*

4.3. *Place Valois (2001-2006)*

In 2001, the City of Montreal launched a development plan for the former railway right-of-way, crossing the Hochelaga-Maisonneuve neighbourhood from east to west. This project came about in the context of the disappearance of industrial complexes that were established in the neighbourhood and the decommissioning of the railway that served them. The four objectives of this project were to reinforce the commercial continuity of Ontario Street (one of the neighbourhood's main streets); to take advantage of the particularities of a historic sector that was urbanised at the turn of the 19th century; to improve the general quality of the living environment and the attractiveness of the neighbourhood; and to integrate the local stakeholders' development objectives and constraints (Eide, Fianu, 2001).

The City Planning Department gave Atelier In Situ, Eide, Fianu architects (Atelier BRAQ), and landscape architect Nicole Valois the mandate to prepare a development plan for the space located at the intersection of Ontario Street, Valois Avenue, and the railway. The designer group was invited to propose a space to "create and formalise the sense that the intersection had the potential of becoming a centre for the sector as a whole". To this end, urban designers proposed to create a new public square inspired by the distinct Montreal tradition of town squares. The urban designers' proposal referred to an existing square, place de la Paix, whose proportions are similar, and they replicated it in the Place Valois project.

The designer team recommended the establishment of the new square on the largest city island northeast of the intersection of the railway and Ontario Street (Figure 5). This entailed the purchase by the City and the demolition of a triangular building in order to free up space needed for the laying out of the new public area. The idea was also to use the line of the former railway tracks to create a new footpath (green link) and to reconstitute the urban fabric by redefining the city islands through which the railway tracks ran. The tracks were used in large part to create a new green link, along which a number of urban planning operations could be implemented. The development involved dividing up the new green link into segments depending on the characteristics of the city islands through which it ran. On the basis of these segments, a range of subsidised housing projects could be incorporated into the new pedestrian pathway using the former railway that led to the new Valois square.

Following the development of the initial overall design by the City of Montreal and pursuant to the decentralisation of urban planning services, the urban planning department of the borough of Mercier-Hochelaga-Maisonneuve took over the project. Based on the design created by In Situ, Eide, Fianu architects, and Nicole Valois, Peter Soland drew up the Valois square development plan. The area was restored to the public domain to mark the neighbourhood's industrial past and the passage of freight trains through the Ontario-Valois junction. Soland designed the Simon-Valois square as a contemporary public space. The pavement, the layout of urban furniture, and strips of vegetation echoed the line of the former railway tracks. The Valois square project displays some characteristics of European urban planning practices. This was a novelty in Montreal. The square was developed before the surrounding housing projects, as a basis for the neighbourhood's revitalisation.

The Place Valois urban design project has met the majority of its objectives. The criss-crossing of blocks of buildings and the former railway reveals the sector's industrial past, and this feature was preserved and showcased by the project. The trace of the railway running through the city fabric was highlighted by the square's development (Schème Consultants, Atelier Urban Soland 2003). Place Valois is part of the history of the city's creation: it is located where

the urban grid meets the geometry of the railway tracks, as well as the former Hochelaga and Maisonneuve neighbourhoods.

The public square is seen as an open space within the built fabric. The coherence of the square's shape is attributable to the shape of the walls that define its frame. The typical street encircling Montreal's public squares was designed to serve as a terrace for adjoining businesses. Façades clearly delimit the space by creating obvious boundaries (Lynch, 1960). Designers drew a parallel between a rail yard where railway tracks converge and a public square where citizens meet.

The green link also evokes a genuine journey along the historic line and connects a range of blocks that were once occupied by industries. The break between buildings encourages citizens to continue their path to the green link promenade. The promenade is dotted with references to railway history, such as paving stones and historic objects. The integration of new housing projects on each side of Place Valois was strictly monitored by the Service d'urbanisme de l'arrondissement. As a result, buildings consolidate the urban grid by adding contemporary touches while showcasing the site's history. The façades overlooking the railway right-of-way are given similar importance to that of façades facing the street in order to provide a certain architectural quality and public space status to the green link path. The concept of continuity was also explicit in the former railway right-of-way's development.

The orthogonal grid of the neighbourhood was preserved and even reinforced. The built front around the square structures the public space, enhances it on the level of Ontario Street, and attributes a new centrality to the neighbourhood itself. The project as a whole highlight the economic revitalisation fostered by the urban design project. Business activity has picked up on Ontario Street, and green spaces can be found along the green link. The Valois project establishes a strong dialogue with the existing built environment.

The Place Valois project has generated positive economic, social, and morphological spinoffs. The organisation of Montreal's urban grid and the setting up of new public spaces have stimulated residential construction and a large number of housing operations along the former rail-

Figure 5. *Place Valois (2001-2006).*

way right-of-way that constitutes the reorganisation line. However, the neighbourhood's status changed promptly following the project's implementation, resulting in protest movements against gentrification of the area. This phenomenon commonly occurs when the general quality of a living environment and the attractiveness of a neighbourhood increase. The borough has solved this problem by promoting some social housing operations along the new green link.

5. Discussion / Conclusion

The analysis of Habitations Boyce-Viau highlighted the introverted nature of its implantation and of its architectural expression. The project was implemented in a context where City authorities chose to rapidly build subsidised housing ensembles as a means to solve social issues (unemployment, decrepit dwellings, and so on). The unrestricted on-site implantation of buildings, with no plot division constraints, the segregation between pedestrian and automobile spaces, and the placing of housing units in a green space are a partial reflection of the ideas presented in the Athens Charter (Le Corbusier, 1957).

The Quartier Saint-Sulpice residential project evokes a type of spatial organisation that straddles the garden suburb and the traditional town. The reinterpreting of the typical housing units of Montreal in the constitution of a residential habitat demonstrates the existence of a movement for the free reinterpretation of historic models in urban design practice. The context of implementation has also changed. The project targeted a specific clientele in order to counter the exodus of households to the Island of Montreal's northern and southern suburban communities. In addition, the awarding of the contract by the City reflects the establishing of quality-related criteria where public authorities assess projects in terms of their architectural quality and their relationship to the urban environment. The influence of postmodernist theories and discourse in the designers' desire to create a built environment that straddles the fine line between the real and the imagined city is manifest in these projects.

As regards Place Valois, an important change can be noted in relation to the degree of integration of the contemporary project into the urban fabric. The design approach was inspired by the history of the place and made explicit reference Montreal urban types, namely its public square tradition. The industrial past of Hochelaga-Maisonneuve nurtured the design process through the keeping and showcasing of certain features. The Place Valois project also reflected the City's desire to act on a larger scale in the organisation of its territory by creating a new centrality for the neighbourhood. This project, focused on the public square, has initiated an urban planning process aimed at protecting the existing built environment and enhancing the quality of Hochelaga-Maisonneuve's network of public spaces.

Despite a limited sampling, this paper on urban projects realised in Montreal since 1956 reveals a certain trend characterising the evolution of the urban design theories underlying these projects. For a work that served as a basis for the publication of two articles focusing on six other projects, Maude Gilles and Simon Wuilmart put together a database that supports the conclusions of the current article (Racine, 2016, 2018). The research shows that contemporary schools of thought have valued a tighter relation of planned built environments to city form and that designers use the context and its latent spatial potential for physical integration to ensure the sustainability of the new urban ensemble (Kostourou, Karimi, 2017).

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