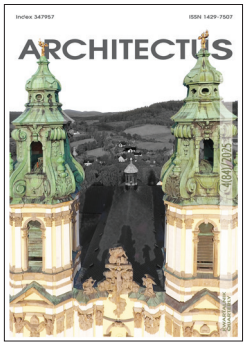

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Greenery as a factor shaping urban planning: the case of selected areas in Montreal

Abstract

In today's dynamic urban context, where cities play a crucial role in shaping the quality of life for residents, the role of greenery as a determinant of public space has become a significant issue. This article focuses on analyzing the impact of greenery on shaping the urban fabric using Montreal as a case study, with particular emphasis on Mount Royal as a key element influencing spatial planning and city development. The author explores various aspects of this issue, including historical and cultural contexts, as well as practical implications. The genesis and development of the city are presented, along with the role that Mount Royal has played in the urbanization process. The analysis also encompasses urban planning strategies that focus on preserving and enhancing green spaces, such as parks and recreational areas, as well as sustainable city development. By delving into the various aspects of greenery presence in Montreal, including urban planning, park distribution, and social initiatives related to green spaces, this article aims to understand the complexity of the relationship between greenery and the shaping of public spaces in the context of this Canadian city. The analysis sheds light on existing challenges related to maintaining and developing green areas, while also highlighting the benefits of effectively utilizing greenery as a key element of urban planning.

Key words: greenery, urban development, sustainable city, public space

Introduction

Greenery has accompanied humanity since ancient times and has been the subject of numerous studies related to its role in shaping urban spaces (Wolch, Byrne and Newell 2014; Wendel, Zarger and Mihelcic 2012; Tołwiński 1963; Gyurkovich, Sotoca 2018). Its role in cities has evolved over different historical epochs – initially serving practical functions, later becoming a decorative element, and eventually combining both aspects (Gyurkovich, Sotoca 2018). Nowadays, there is an increasing emphasis on the necessity of protecting and developing green areas in cities, as well as recognizing their positive impact. This phenomenon is linked not only to improving the natural environment in urbanized areas but also to providing residents with places for recreation and relaxation in environments conducive to their well-being. Gradually, people are also becoming more and more aware of environmental issues and environmental conservation. Urban green spaces play a significant role in urban planning as they are important indicators of quality of life. They have a positive impact on the urban ecological environment, social and economic development, and the physical and mental health of residents, both adults and children (Markevych et al. 2017).

In contemporary metropolises, greenery has become an essential component of the city's spatial structure, contributing to a healthy living environment alongside other factors. Contemporary green spaces, in addition to their aesthetic and recreational functions, play a crucial role in carbon absorption, temperature regulation, and the reduction of urban heat islands, which is of direct significance in the context of cities adapting to climate change (Markevych et al. 2017). In the context of contemporary urban movement and its consequences, greenery becomes a significant part of residential areas in large conurbations (Virtudes 2016). Sometimes, especially in the historic centres of large cities, there is little greenery, and public spaces are dominated by paved squares and streets (Whitford, Ennos, and Handley 2001). This phenomenon occurs both in charming European cities

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and in other parts of the world. Therefore, there is a need to achieve a balance between urban areas and nature, making the integration of greenery an essential element of spatial planning in cities (Kus, Felski 2018). The city's image, analysed through the structure of green spaces, is shaped by various parks and green areas. These diverse forms include both continuous and linear green corridors and areas, as well as points with various functions, investments, and levels of development. Street trees, avenues, and even individual trees or flower beds are also important aspects of green perception. The urban layout is structured by greenery, serving a number of functions, including connecting, dividing, blocking, isolating, obscuring, masking, as well as decorative (Virtudes 2016; Kowalska-Koczwara et al. 2021). Urban green areas and parks often become distinguishing features, identity elements, and symbols of the city.

Methods

The aim of this article is to analyze the historical development of green spaces in Montreal and examine their role in shaping public spaces in selected areas of the city. The core objective of the research was to assess the impact of green spaces on residents' quality of life and the changes that have occurred in these areas as urban development progressed. Additionally, the analysis aimed to identify how urban green spaces contribute to the spatial layout and urban structures of the city. The research was divided into two main parts. The first part included a review of the literature and documentation related to the development of urban green spaces in Montreal, considering both historical and contemporary changes in their function and distribution. Historical documents, urban plans, and architectural studies were examined to trace the evolution of green spaces from the city's founding to modern-day urban green solutions. This section aimed to identify key stages that influenced the formation and development of green spaces, as well as to understand how urbanization has impacted these changes. The second part of the research involved a detailed analysis of selected districts in Montreal: Petite Bourgogne, Griffintown, Mille Carré Doré, Centre Ville, Vieux Montréal, and Town of Mont Royal (Fig. 1). These districts were chosen based on their diverse urban structure, degree of green space development, and historical significance. This study aimed to assess the impact of green spaces on the quality of public space and explore how the presence of greenery shapes the functions of these areas within an urban context.

To guide the research more precisely, the following research questions were posed:

1. What changes in the distribution and structure of green spaces have taken place in Montreal over the years, and how have they influenced the shaping of public spaces?

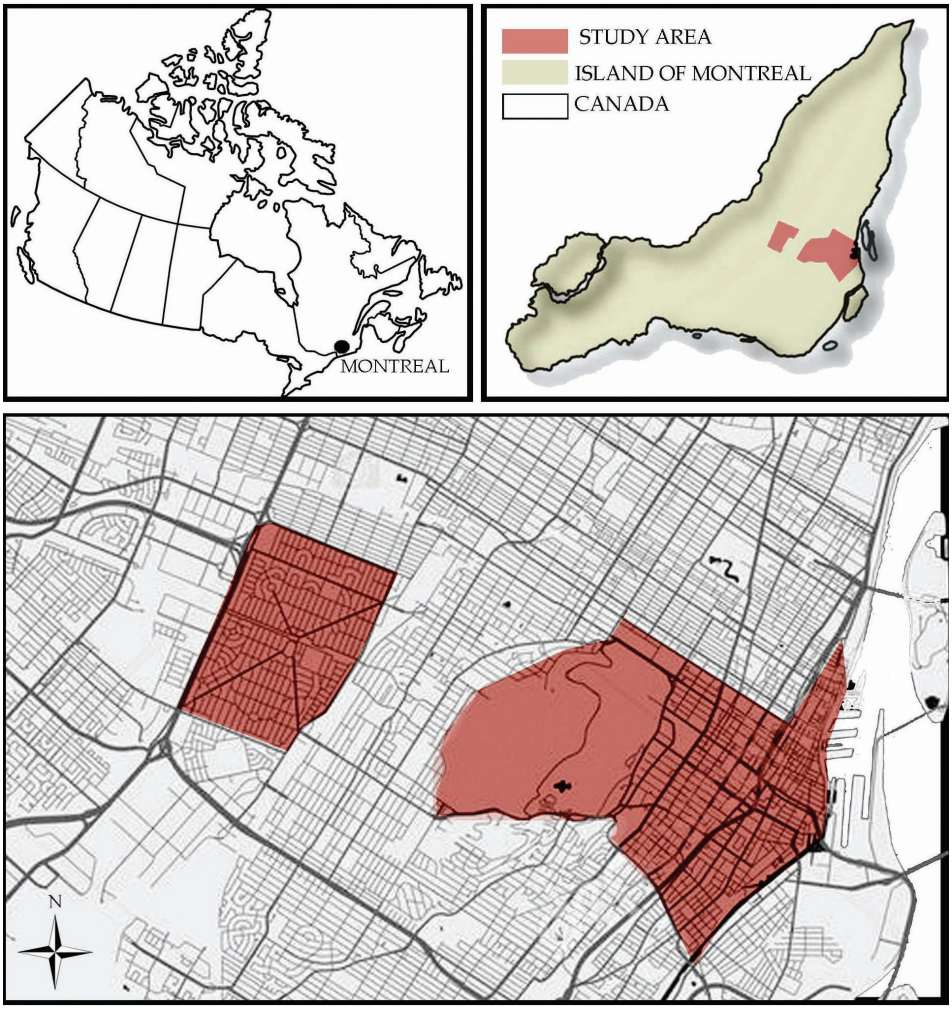

Fig. 1. Study area (elaborated by A. Biała)

Il. 1. Obszar opracowania (oprac. A. Biała)

This question sought to understand how the city's development, particularly its urbanization, has affected green areas and their placement in public spaces.

2. What are the relationships between green spaces and urban structures in selected Montreal districts, and how have these relationships evolved over time?

This question focused on examining the interaction between urban green spaces and the built environment, analyzing how these elements influence each other and what changes have occurred in their relationship over time.

The research emphasizes the importance of green spaces as elements that contribute to the sustainable development of cities. In the context of Montreal, the analysis provides valuable insights into the challenges and opportunities related to the preservation and creation of urban green spaces, as well as their role in mitigating the negative impacts of urbanization. This article attempts to summarize and organize existing studies on urban green spaces in Montreal, highlighting key issues related to managing green spaces in rapidly growing cities.

Historical background and architectural and town-planning development

Montreal, the largest city in the province of Quebec, Canada, stands out not only for its rich culture and history but also for its fascinating architecture, which has evolved over decades. The city is located on the Island in the southwestern area of Quebec, at the confluence of the Ottawa and Saint Lawrence rivers, encompassing approximately 315 km of coastline (City of Montréal 2008). Being a modern and densely populated urban agglomeration, it has many spatial features influenced not only by urban planning solutions but also by the city's geographical location. Riverbank ecosystems and islands constitute significant sources of biological diversity. Green spaces account for 13% of the total area of the city, including the over 200-hectare Mount Royal, which the city commemorates in its name (City of Montréal 2008; Ville de Montreal 2018; Seline 1983).

The territorial expansion of Montreal is a fascinating issue that illustrates changes in the urban structure and its impact on surrounding areas (Fig. 2). In 1642, settlers led by Paul de Chomedey de Maisonneuve and Jeanne Mance founded the settlement of Ville-Marie on the riverbank, surrounded by the mountain, which became the nucleus of today's city (Seline 1983; Marsan 1981). The city began to grow intensively during the industrialization period, especially in the 19th century. This period saw a great population growth, and the industry and infrastructure development prompted urban expansion. The initial stages of development mainly focused around the central commercial and industrial areas. With Montreal's population expansion, it extended its boundaries, incorporating surrounding areas and villages, eventually encompassing all regions of the mountain. In the initial phases of expansion, the city focused on maintaining harmony between the urban structure and the natural environment. In the context of urban development, natural environmental elements, such as Mount Royal and the Saint Lawrence River, played a crucial role in shaping and expanding the city's territory. Since Jacques Cartier discovered Mount Royal in the 16th century, it has stood out as a unique landscape feature and a symbolic point of reference for residents and visitors, which became particularly noticeable from the mid-19th century, when major urban developments such as the creation of cemeteries, parks, and monumental buildings emphasized its morphological specificity. Located in the heart of Montreal, Mount Royal has been a significant factor shaping the city's territory (Seline 1983; Marsan 1981; Debarbieux 1998).

The first signs of green areas began to appear in Montreal in the 1st half of the 19th century, but their significance and popularity noticeably increased in the 2nd half of the century (Dagenais 2008). Squares, public plazas, and large parks began to emerge throughout the city. Although they were natural enclaves, they were primarily cultural spaces, reflecting many social values and ideals. Their creation aimed not only to beautify the cities and promote their image but also to demonstrate the economic progress of a given location, its financial stability, and proper management. The concept of park development envisioned them as pleasant and tranquil places where people could walk, rest, and contemplate nature. As Montreal grew and expanded, green spaces became a way for municipal authorities to assert their presence on the territory and extend the reach of urban influence. Since the 1890s, especially after 1900, public debates on the development of parks and green areas have intensified (Dagenais 2008). The earlier concept of parks as city adornments evolved towards a social need, indicating a growing demand for access to green and recreational areas. Influenced by the reform movement focused on improving the quality of life in industrial cities, the authorities of Montreal committed to continuing the development of a network of recreational spaces, especially in working-class neighbourhoods. Initially, parks were mainly perceived as places for aesthetic strolls and contemplation, but their increasing popularity led to them being viewed as venues for various forms of recreation, attracting diverse groups of users. Consequently, city authorities began to equip parks with additional cultural elements,

Fig. 2. Montreal and its first transformations (elaborated by A. Biała, based on https://imtl.org/image/cartes/small_scan083.jpg, 2024)

Il. 2. Montreal i jego pierwsze transformacje (oprac. A. Biała, na podstawie: https://imtl.org/image/cartes/small_scan083.jpg, 2024)

such as playground equipment, picnic tables, pavilions, etc., emphasizing the change in perception of these green spaces as functional recreational centres rather than merely aesthetic natural havens (Dagenais 2008).

Since the establishment of the settlement, Mount Royal has played an important role for its inhabitants, who often went there for picnics or to enjoy the scenery (Debarbieux 1998). In the 1870s, efforts began to shape the area to meet the social expectations of that time. It was then decided to create two cemeteries and a public park on the mountain's grounds. This was aimed at preserving the natural heritage but also providing residents with a place for rest and recreation. Frederick Law Olmsted, a renowned landscape architect and the creator of Central Park in New York, was appointed to design this area (Debarbieux 1998). His creative approach to park planning facilitated the harmonious integration of the mountain terrain into the urban fabric, while emphasizing its uniqueness. Olmsted, staying true to his ethical and aesthetic principles, adapted the concept of English landscape to the specifics of the American context. He introduced artificial elements, while striving to make them almost invisible in the natural environment. This first encounter with diverse topography in his career prompted him to reject the idea of a traditional park in favour of revealing the "genius loci" – the characteristic spirit of that particular place (Debarbieux 1998).

The increase in the city's population necessitated the incorporation of green areas into central city areas, providing residents with access to parks and recreational areas. In the post-war period, the phenomenon of suburbanization emerged, where residents moved to the suburbs in search of more space and tranquility. As part of this process, urban greenery became a key element of spatial planning. The creation of new neighbourhoods involved the consideration of green spaces, parks, and promenades to maintain a balance between urban elements and the natural landscape. However, due to intense and somewhat uncontrolled city development between 1986 and 1994, half of the forests were built upon, and between 1994 and 2001, another 750 ha of greenery were lost (Oljemark 2002), ultimately losing 18% of greenery by 2005 (Pham et al. 2011). The city's policy at the time did not sit well with the residents, who placed more importance on maintaining existing green areas and creating new recreational spaces in the city. The influence of residents on the decision of city authorities regarding green areas can be exerted through various mechanisms, including participation in public consultations, petitions, actions of social groups and non-governmental organization (NGO), and engagement in electoral processes (Burstein 2003). Residents often engage in active actions to express their opinions and demands regarding the protection of green areas and the development of recreational spaces in their area. This highlights the significant role of society in shaping municipal policies concerning the natural environment and recreation, as well as the need for active dialogue between residents and authorities in the decision-making process regarding public spaces.

In the face of challenges related to overcrowding and maintaining quality of life, pressure from public opinion represented by the Green Coalition on green issues, city authorities have turned their attention to sustainable development, emphasizing environmental protection and creating additional green areas. In 2005, Montreal adopted its first Sustainable Development Strategic Plan, which represents a collective commitment to making sustainability the foundation for the city's future development. One of the plan's objectives was to protect biodiversity, natural habitats, and green spaces, including increasing the area of protected natural habitats to 8% of the total area of the island under the city's jurisdiction (City of Montreal 2008). With its unique topography and diverse landscape, Montreal began to regain its reputation as a city where urban greenery harmoniously coexists with development. Parks, gardens, and riverside promenades create picturesque landscapes, attracting residents to use green spaces. Currently, the City of Montreal plays a significant role in promoting biodiversity initiatives internationally (City of Montreal 2008).

In the research history of cities, the analysis of urban environments often remains overshadowed (Dagenais 2008). Most scientists focused primarily on studying natural ecosystems rather than the human environment. Cities were considered less significant in scientific research because researchers were primarily focused on efforts to halt environmental degradation and condemn the excessive exploitation of natural resources in the name of market economy. In their eyes, cities were seen as enemies of nature, places that harmed the surrounding environment. Although today the relationships between social and natural environments are the subject of intensive research by environmental historians, studies on cities remain relatively neglected. In recent years, ideas related to how people interact with their surrounding nature have developed and extended beyond activist and political aspects. Research on the history of cities from an environmental perspective now requires an analysis of the relationships between people and natural elements, taking into account the dynamic changes occurring on both sides of this equation. As historian Geneviève Massard-Guilbaud (Dagenais 2008) explains, the environmental approach to history rejects the concept that humans are external observers of nature, instead accepting the idea of their integral inclusion in the biosphere, from social units to entire ecosystems.

Scaling space through greenery modelling in selected examples

The urban layout of downtown Montreal is characterized by a grid of streets running perpendicular or parallel to Mount Royal Park, creating a regular pattern with geometric designs. This urban structure is partly inspired by the mountain, located to the west of downtown, which is a dominant feature of the city's landscape (Fig. 3). Its presence not only provides a picturesque backdrop but also influences the organization of the urban space. The central area of Montreal features a unique urban layout that has evolved over the years. It is centered around two main axes – Rue Sainte-Catherine and Rue Sherbrooke (Lord 2016) – serving as the commercial, cultural, and business hub of the city. Rue Sainte-Catherine, one of the main shopping thoroughfares, serves as the primary east-west axis, offering numerous shops, boutiques,

cafes, and restaurants. It is also a venue for various urban events, festivals, and parades, taking over this function from Notre-Dame Street in the late 19th and early 20th centuries. Meanwhile, Rue Sherbrooke, located slightly further north, is known for its upscale shops, elegant restaurants, and cultural institutions, such as museums and art galleries. The central areas of Montreal also feature diverse architecture, including both modern skyscrapers and historical buildings, adding to the region's unique character. Additionally, the historic district of Vieux-Montreal occupies a central place, where charming cobblestone streets, historic buildings, and atmospheric squares can be found. Mount Royal is accessible via numerous pedestrian paths and bike trails, integrating its surroundings with the city's urban planning (Lord 2016).

Despite the dense and compact urban development, the streets in the analysed area of the city stand out for their abundance of urban greenery. The largest concentration of parks and street greenery is located along the St Lawrence River in the Old Montreal area covered by the Old Montreal Protection and Enhancement Plan, as well as in the area between Rue Notre Dame and Sainte Antoine O. Streets, which corresponds to the Griffintown district (Fig. 4). Thanks to the Special Planning Program (SPP) for the Griffintown area, municipal actions in the public space have focused on transforming social spaces, prioritizing the needs of residents over vehicular traffic. The project aimed to create eight new green areas and public spaces. The total budget for public investments in this regard amounted to 242 million dollars, which were allocated for land acquisition for parks, the development of existing parks and public spaces, street modernization, the purchase of certain significant buildings, as well as their revitalization and improvement of cultural functions (City of Montreal 2017).

An interesting initiative is the green plaza that is part of the Bonaventure Expy Street, created as part of the Bonaventure Project (Fig. 5). By demolishing the elevated section of the highway and replacing it with a ground-level boulevard, dedicated blocks will provide high-quality, safe, and user-friendly public spaces between the streets of Wellington and Notre-Dame (City of Montreal 2017).

The construction of the Ville-Marie highway also had a negative impact on the Quartier International area, which was significantly damaged as a result of its construction. Therefore, through the Special Planning Program (SPP), efforts were made to repair and rebuild the public space in this central part of the city. It was decided to combine the idealistic modernist model, based on multi-layered verticality, with the typomorphological ideal of continuity of public space both at the ground level as well as above and below it. The aim was to create alternative pedestrian routes that would harmoniously blend into the existing urban fabric, connecting streets and sidewalks with underground urban spaces. The remaining streets are characterized by an abundance of street trees. City parks, cultural institutions, and streets surrounded by greenery create a ohesive space that allows residents to maintain a balance between urban life and the natural environment. This symbiosis between the downtown area and Mount Royal is a key characteristic of Montreal, highlighting its uniqueness and attractiveness as a place to live and work (City of Montreal 2017) (Fig. 6).

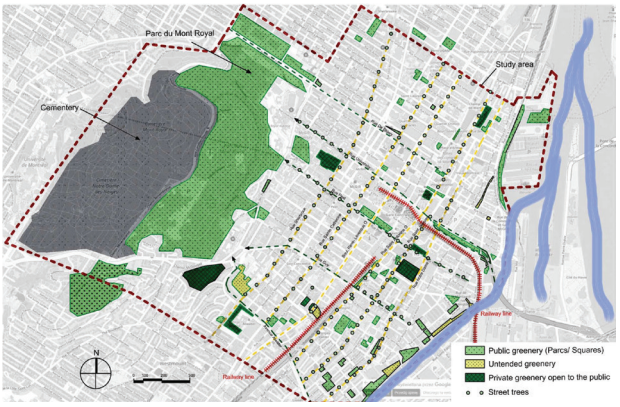

Fig. 3. Spatial configuration map of greenery
(elaborated by A. Biała, based on https://www.google.com/maps, 2024)

Il. 3. Mapa przestrzennej konfiguracji zieleni
(oprac. A. Biała, na podstawie: https://www.google.com/maps, 2024)

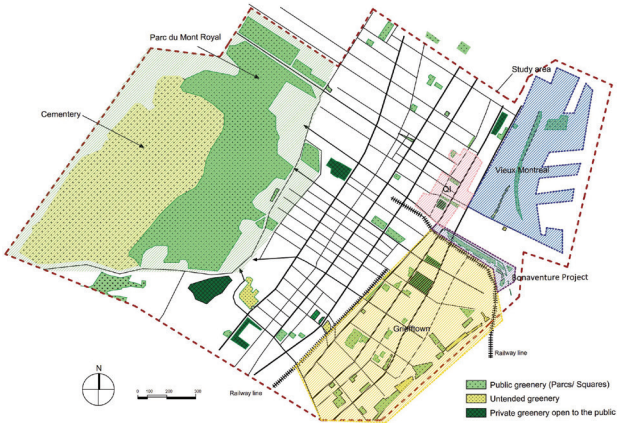

Fig. 4. Spatial configuration map of greenery
(elaborated by A. Biała, based on https://www.google.com/maps , 2024)

Il. 4. Mapa przestrzennej konfiguracji zieleni
(oprac. A. Biała, na podstawie: https://www.google.com/maps 2024)

Fig. 5. Bonaventure Project – replacing the existing viaduct with a new surface level urban boulevard
(elaborated by A. Biała, based on https://www.google.com/maps2024)

Il. 5. Bonaventure Project – zastąpienie istniejącego wiaduktu nowym, naziemnym bulwarem miejskim
(oprac. A. Biała, na podstawie: https://www.google.com/maps, 2024)

Fig. 6. Streets of Montreal (photos by A. Biała, 2023)

Il. 6. Ulice Montrealu (fot. A. Biała, 2023)

Urban analysis of downtown Montreal reveals the significant impact that natural landscape elements, including Mount Royal, have on the city's structure. The street layout in downtown Montreal, characterised by a regular grid of perpendicular and parallel arteries, reflects the influence of Mount Royal, which serves as a dominant landscape feature affecting urban spatial organization. Historical and contemporary urban elements, such as Rue Sainte-Catherine and Rue Sherbrooke, play key roles in commerce, culture, and business, defining the central areas of the city. On the one hand, the regularity and geometric patterns in the urban layout result from adaptation to the topography and function of Mount Royal. On the other hand, this spatial planning fosters dynamic development in commerce and culture. Contemporary initiatives, such as the revitalization of Griffintown and the creation of the green square as part of the Bonaventure Project, demonstrate a commitment to enhancing public spaces and integrating greenery with urban design, underscoring the importance of urban greenery in improving residents' quality of life. Additionally, the negative impacts of the Ville-Marie Expressway on the Quartier International area, which have been mitigated by the Special Planning Program, highlight the significance of rebuilding and adapting public spaces in the context of urban modernization. New urban solutions, such as multilayered verticality and the integration of underground spaces, emphasize the effort to harmoniously incorporate modern functions into the existing urban fabric.

As shown in Table 1, Montreal actively strives to improve the quality of the natural environment through various initiatives, ranging from strategic municipal programs to local community efforts and student-led projects. The city has adopted an ambitious plan called the Montréal 2030 Strategic Plan for Sustainable Development, which includes investments in the development of green spaces, increasing park areas, and promoting public transportation and sustainable modes of transportation. Under this plan, the city takes actions to increase the number of trees by regularly planting new seedlings in selected urban areas, contributing to air quality improvement and enhancing the aesthetics of the place. Additionally, it continually invests in the development of existing city parks and the creation of new recreational areas, which helps improve the quality of life for residents by encouraging outdoor activities and relaxation in a natural environment (AIPH 2024).

Local communities and students from various universities engage in volunteer activities aimed at nurturing existing green areas, whether it is by removing litter, planting plants, or taking care of city parks. Students conduct research and educational projects related to environmental protection, promoting ecological awareness in the local community and taking actions to improve green areas. As shown in Table 1, Montreal undertakes a wide range of initiatives aimed at improving the natural environment and increasing green spaces in the city. These actions include both overall citywide and neighbourhood-specific strategic programs, as well as active involvement of the local community and students.

In the context of Montreal's urban greenery, the role of autonomous district units is a crucial factor in shaping the landscape and distribution of green spaces throughout the city. One of the most distinctive examples is the Mont-Royal district, whose creation was directly linked to the rapid development of Montreal in the early 20th century. However, this dynamic urban growth encountered significant topographical barriers, such as Mont Royal and the Saint

Table 1. Green programs in city of Montreal (elaborated by A. Biała)
Tabela 1. Programy zieleni w mieście Montreal (oprac. A. Biała)

Project name	Project program
Programs at the city-wide level	
Montréal 2030 Strategic Plan 2023–2030	The program seeks to speed up the shift towards ecological sustainability. This is achieved by prioritizing biodiversity and green areas in decision-making processes and enhancing city practices through incorporating the Climate Test and conducting gender-based intersectional analysis (GBA+) (AIPH 2024)
The Corridor écologiuqe Darlington project 2020	This urban route will connect Mount Royal to the Hippodrome and the Outremont campus, facilitating movement for both wildlife and people (Ouellet 2024)
Le Grand parc de l'Ouest 2023–2030	This project encompasses 3000 hectares designated for the creation of green spaces in the eastern part of the island (Lau 2020)
Montreal's Green Revival 2021	This plan outlines the city's vision and priorities for revitalizing its expansive parks and natural areas while promoting an active lifestyle for both current and future residents of Montreal. The plan consists of four main components: protecting and connecting green spaces, enhancing access to water to strengthen the island's identity, improving the accessibility and resilience of Mount Royal, and promoting year-round activity through a variety of recreational options and updates to sports facilities. To drive Montreal's environmental renewal, the Plan is organized around four pillars: Green Montreal, Blue Montreal, Summit Montreal, and Active Montreal (City of Montreal 2021)
Local programs	
The Old Montreal Protection and Enhancement Plan 2013–2017	The aim of the program is to enhance the quality of life for residents by creating a better environment for daily living, as well as preserving and promoting the cultural and historical heritage of the area (City of Montreal 2017)
Special Planning Program (SPP) for the Griffintown Area 2013–2030	The program is based on the redevelopment of existing public spaces, including redesigning over 10 kilometers of streets, and a property acquisition program aimed at creating eight new green areas and public spaces (City of Montreal 2017)
Bonaventure Project 2011–2017	Replacing the existing Bonaventure viaduct highway, constructed in 1966, with a new surface-level urban boulevard named Boulevard Robert-Bourassa (City of Montreal 2017)
Green Marine 2007	Green Marine is a comprehensive and inclusive initiative committed to enhancing environmental performance beyond what is mandated by regulations. It upholds rigorous standards and promotes transparency throughout its processes (Port of Montreal 2024)
Quartier des spectacles (QDS) 2002–	A strategy for green urbanization has been formulated in partnership with urban ecology experts to address the impacts of climate change. This plan will be executed through initiatives focused on enhancing green infrastructure, facilitating university research support, and organizing culturally relevant programs (City of Montreal 2017)
Quartier international de Montréal (QIM) 1997–2004	The redevelopment of the vicinity surrounding Victoria Square and the Palais des congrès de Montréal entails various initiatives. These include the partial covering of the Ville-Marie expressway, the construction and reconfiguration of public spaces, and the expansion or construction of key buildings in the vicinity (City of Montreal 2017)
Bassins du Nouveau Havre 2008	The development strategy centres on enhancing the remnants of the former Lachine Canal pools, formerly crucial components of Montreal's inner port. It prioritizes sustainable development approaches like rainwater harvesting, minimizing traffic density, and optimizing building efficiency. This encompasses the establishment of Bassin-à-Bois Park and Bassin-à-Gravier Park, Plac des Arrimeurs, and the implementation of a bioretention pond for collecting rainwater (City of Montreal 2017)
Mount Royal enhancement plan 1992	Preserving and improving Mount Royal; ensuring accessibility and hospitality on the mountain; establishing conducive circumstances for the protection and enhancement of Mount Royal (City of Montreal 2009)
Social initiatives	
Biodiversity enhancement project in HEC Montréal 2021	The objective is to conserve and augment the biodiversity of ecosystems situated in the peripheral zones of the school, situated within the Mount Royal heritage area. A series of interventions has been proposed, encompassing the introduction of new arboreal and shrub species, safeguarding extant plant species and pollinators, and implementing landscape modifications directed towards enhancing spatial quality (HEC Montreal 2022)
200 Urban Gardens Project 2020	Through the establishment of 200 Urban Gardens, the objective is to establish an interconnected network of green spaces that prioritize equity and serve multiple functions, fostering a culture of sustainability across Montreal. The program seeks to transform neglected parcels of land into vibrant gardens, revitalizing them to enhance the well-being of residents (McDevitt 2021)

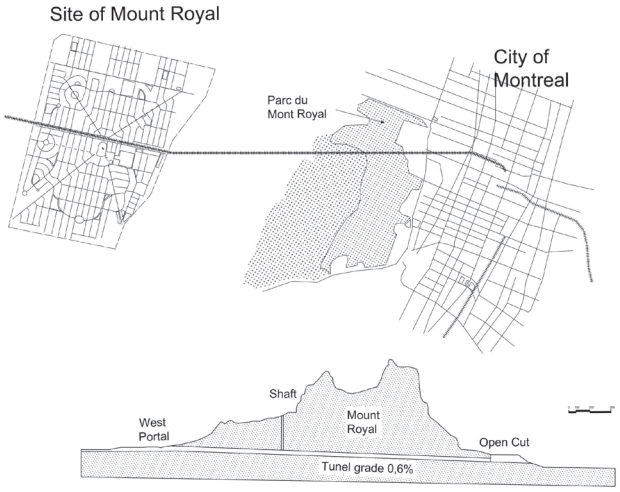

Fig. 7. Town of Mont Royal in relations to Mont Royal Tunnel and central district of Montreal (elaborated by A. Biała, based on Zarabi et al. 2016)

Il. 7. Miasto Mont Royal w relacji do tunelu Mont Royal i centrum Montréalu, 1912 (oprac. A. Biała, na podstawie: Zarabi et al. 2016)

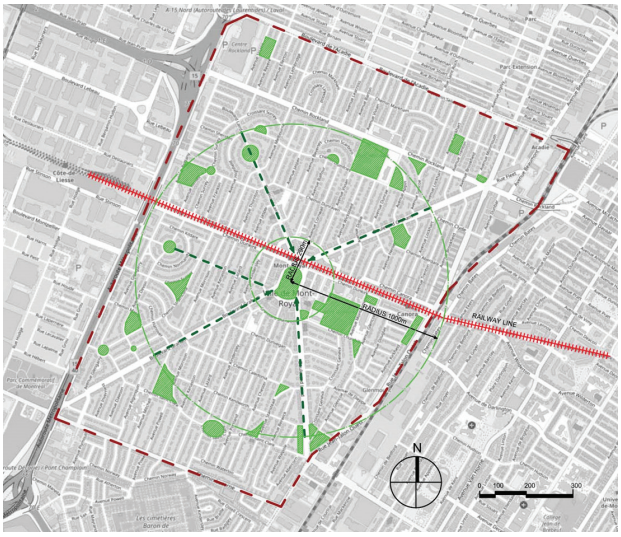

Fig. 8. Spatial configuration map of greenery of Mount Royal (elaborated by A. Biała, based on https://www.google.com/maps 2024)

Il. 8. Mapa rozplanowania zieleni w Mount Royal (oprac. A. Biała, na podstawie: https://www.google.com/maps 2024)

Lawrence River. These natural features limited the city's expansion to the east and west, significantly impacting the development of transportation infrastructure, particularly railways. The inability to directly connect the city centre with the areas located west of Mont Royal posed a serious challenge to urban development. In response to these difficulties, Montreal authorities undertook a costly but strategically essential project: the construction of a tunnel beneath Mont Royal (Fig. 7). This tunnel enabled the connection of the city centre with the western part of the island, leading to an increase in the attractiveness and value of land in that area. Following these changes, and initiated by Canadian Northern Railway, the suburban district of Mont-Royal (TMR) was established in the early 1910s. The creation of this district not only influenced Montreal's urban development but also significantly contributed to the shaping of green urban spaces in this part of the city (Zarabi et al. 2016).

Designed by Frederick Gage Todd, this urban area reflects the influence of landscape architecture and urban planning principles, in accordance with the principles of the City Beautiful and Garden City movements. The district combines three different planning concepts: a grid plan, diagonal boulevards from the City Beautiful movement, and a curvilinear street pattern proposed by Frederick Law Olmsted (Zarabi et al. 2016). The area mainly consists of residential buildings, including both small single-family houses and apartment complexes, hence the street grid was intentionally tilted to maximize sunlight exposure. Businesses, schools, and churches are located along strategic arteries, and the district's historical character is evident in both the main streets and avenues and in the urban structure and numerous green spaces. The combination of low-density residential development with lush vegetation gives this suburb the characteristic appearance of an urban park. At the heart of the radial city plan is the railway station and public square, where two main avenues and the railway line converge. Parks and open recreational spaces in this area are connected by concentric roads, forming a winding, enclosed loop layout within a 1 km radius (Fig. 8). Additionally, winding streets enriched with greenery and diverse plantings complement the area.

Urban greenery in Mont-Royal, which includes 30 parks and over 70 other green spaces, plays a crucial role in enhancing the quality of life for its residents (Zarabi et al. 2016). The deliberate arrangement of green areas, combined with residential and public spaces, fosters social integration and supports the health and well-being of the community. The fact that there is at least one tree per resident underscores the commitment to providing access to greenery and its benefits in everyday life. The layout of parks and open recreational spaces in Mont-Royal, designed with concentric roads and winding streets, creates a cohesive network that encourages an active lifestyle and social interaction. This approach to public space planning may serve as an inspiration for other cities aiming to develop sustainable and functional urban areas. In summary, Mont-Royal exemplifies the effective integration of greenery with urban planning, offering a model for future urban projects. It highlights the importance of incorporating natural elements into urban design to achieve sustainable development and enhance residents' quality of life in urban environments.

Conclusion

Based on the conducted research, it can be concluded that urban greenery plays a significant and multifaceted role in shaping the urban structure of the historic parts of Montreal, particularly evident in the studied districts of the city. Historical analysis revealed that, especially during the early phases of intense urbanization, the city's development led to substantial neglect and reduction of green areas. During this period, the emphasis on infrastructure and urban expansion resulted in the degradation of natural green spaces. However, with the growth of ecological awareness and local com-

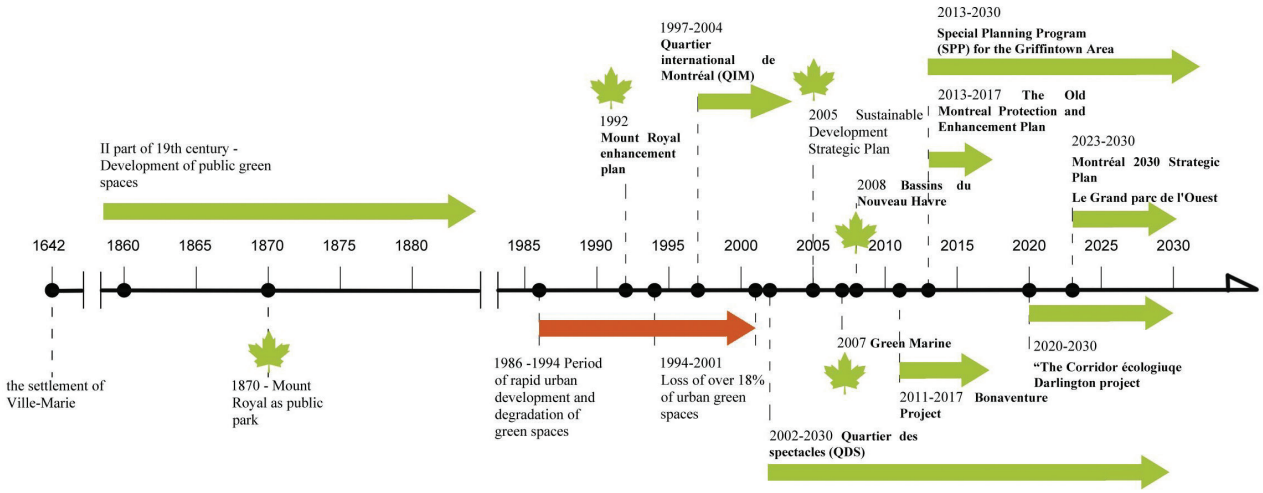

Fig. 9. Timeline of key green space initiatives and programs in Montreal (elaborated by A. Biała)

Il. 9. Oś czasu kluczowych inicjatyw i programów dotyczących terenów zielonych w Montrealu (oprac. A. Biała)

munity pressures concerning quality of life, Montreal began to take actions aimed at restoring green areas and integrating them into the urban fabric.

The timeline presented in Figure 9, showing key decisions related to urban green spaces, highlights that despite the degradation of greenery during periods of rapid city development, efforts were made to protect and preserve areas like Mount Royal Park, which has maintained its significance throughout the city's history. A noticeable shift in Montreal's urban policy occurred after 2005, leading to the introduction of numerous pro-environmental programs aimed at revitalizing and increasing the accessibility of green spaces. These initiatives include ambitious green infrastructure development plans, which focus not only on restoring damaged areas but also on reinforcing them as key elements of the city's urban structure. This shift reflects a broader trend of adapting cities to contemporary challenges, including climate change, air quality improvement, and the reduction of urban heat islands. Natural landscape features such as Mount Royal and the Saint Lawrence River have historically played a pivotal role in shaping Montreal's spatial development and continue to influence the city's urban layout. These elements, beyond their aesthetic value, have served as natural constraints, guiding the growth and distribution of the city's infrastructure. Contemporary urban planning in Montreal increasingly incorporates these features, integrating green spaces as an essential component of urbanization processes.

This research also demonstrates that urban greenery in central Montreal significantly enhances the quality of public spaces, providing areas for recreation and social integration. Additionally, the analysis of the relationship between green spaces and urban development confirms that modern urban planning is increasingly driven by sustainable principles. In this context, greenery serves not only aesthetic functions but also plays vital social and ecological roles. The findings emphasize the necessity of further integrating urban greenery into the city's development strategies, not only for its aesthetic and recreational benefits but also as a crucial element in ensuring sustainable development, environmental protection, and improving the quality of life for residents. The pro-environmental initiatives introduced since 2005 position Montreal as an exemplary city that is progressively adapting to contemporary urban challenges and recognizing the growing importance of green spaces within its sustainable development strategy.

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Streszczenie

Zieleń jako czynnik kształtujący planowanie na przykładzie wybranej części miasta Montreal

W dzisiejszym dynamicznym kontekście urbanistycznym, w którym miasta odgrywają kluczową rolę w kształtowaniu jakości życia mieszkańców, istotną kwestią staje się rola zieleni jako determinanty przestrzeni publicznej. Autorka artykułu skoncentrowała się na analizie wpływu zieleni na kształtowanie urbanistyki miasta na przykładzie Montrealu, przy szczególnym uwzględnieniu góry Mount Royal jako kluczowego elementu wpływającego na planowanie przestrzenne i rozwój miasta. Zbadała różnorodne aspekty tego zagadnienia, włączając w to zarówno historyczne i kulturowe konteksty, jak i praktyczne implikacje. Przedstawiła genezę i rozwój miasta, a także rolę, jaką Mount Royal odegrała w procesie urbanizacji. Analizą objęła również strategie planowania miejskiego, które koncentrują się na zachowaniu i rozwijaniu terenów zielonych, takich jak parki i tereny rekreacyjne, oraz na zrównoważonym rozwoju miasta. Zgłębienie różnych aspektów obecności zieleni w Montrealu, włączając w to planowanie urbanistyczne, rozmieszczenie parków i inicjatywy społeczne związane z zielonymi przestrzeniami, pozwoliło na zrozumienie złożoności relacji między zielenią a kształtowaniem przestrzeni publicznej w tym kanadyjskim mieście. Analiza rzuciła światło na istniejące wyzwania związane z utrzymaniem i rozwijaniem obszarów zielonych, podkreślając jednocześnie korzyści wynikające z efektywnego wykorzystania zieleni jako kluczowego elementu urbanistyki.

Słowa kluczowe: zieleń, rozwój urbanistyczny, zrównoważone miasto, przestrzeń publiczna