Montréal
Sustainable Development

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Montréal: Sustainable Development
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Foreword

This electronic publication is the outcome of a collaboration between the three Summer 2006 Power Corporation Award recipients at the Canadian Centre for Architecture. Our team was given the challenge of researching sustainable development as it relates to "architecture and the city" in Montréal. Many collaborators and colleagues helped in shaping this project, in exploring different sources and contributed to framing the discussion about sustainable development. They include: Phyllis Lambert, Alexis Sornin, Mirko Zardini, Giovanna Borasi, Robert Desaulniers, Geneviève Dalpé, Paul Chénier, Pierre Boisvert, Christine Minas-Heise, Charles Waldheim, Thierry Mandoul, Jean Attali, Chantal Gagon, Danielle Lussier and Pierre Bélanger. To all of you, our sincere thanks.

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Introduction

The ability of the human race to sustain itself has been called into question in past decades due to the severe environmental impact of its way of life, for example Itai-itai disease, Bhopal disaster, Banqiao Reservoir Dam, Three Mile Island, Ixtoc I. Global warming--now referred to as the innocuous "climate change"--is presenting itself as the major environmental challenge of the 21st century. Despite the substantiation of this phenomenon by several leading experts world-wide, the differences of opinion concerning the immediate gravity of the issue undermines concrete engagements.

Nevertheless, measures and policies are being negotiated. For instance, the Kyoto protocol has been established and groups such as Global Atmosphere Watch are organizing themselves. It appears sustainable development is the solution attracting the most support and attention. However, the action areas of this concept are not clear and interests are divided.

In recent years, the term has grown more and more popular. The idea of sustainable development has percolated global conferences to national, provincial, and municipal forums. In April 2005, the City of Montréal launched its first strategic plan for sustainable development. The guiding principle behind it is the poster-child of sustainable development definitions:

> *Sustainable development is development that meets the needs of the present without jeopardizing the ability of future generations to meet their own needs.*

This quotation, from the 1987 Bruntland Commission (or the World Commission on Environment and Development), is the global explication for sustainable development. However, in operational terms the definition is ambiguous. What are the present needs? How are they to be determined? How does one establish future needs? Essentially, these laudable words do not explain exactly what sustainable development is.

Part One -- A Genealogy of Sustainable Development -- attempts to shed light on the meaning of sustainable development by tracing the evolution of the term. It presents a partial inventory of the definitions and critiques of the concept from the seventies to the present-day.

Part Two -- What is Montreal ? -- moves away from the explanations surrounding sustainable development, to exploring it in more concrete terms through data about the city of Montréal. A portrait of the city is presented according to categories of systems most often associated with the idea.

Part Three -- Singular perspectives -- or the final section of the document, consists of three distinct interpretations of sustainable

development as it relates to Montréal. These explorations utilize the information from parts one and two as a foundations for their individual investigations. The first "Landscapes of Potential," presents an overview of the discourse surrounding strategies for urban growth through a photo-essay linking the discussion to Montréal. The second, "Connect/Disconnect: a sectional investigation of the infrastructures along a transportation corridor," investigates the Ville-Marie Expressway and environs to shed light on the interaction of various transportation infrastructures in the city centre and their impact on the pedestrian experience. The third, "History of the Des Seigneurs Community Garden: Creation of a Space for a Sustainable Practice" delves into the establishment of a community garden in Montréal during the 1970s.

Collectively, the research in this document addresses how sustainable development relates to the city of Montréal. While, it does not propose solutions for how Montréal could pursue sustainable development, it does discuss how the concept pertains to Montréal. In short, this collaboration examines what is tacit, as well as what is explicit about sustainable development in Montréal.

Part One: A Genealogy of Sustainable Development

"Development that meets the needs of the present without jeopardizing the ability of future generations to meet their own needs"

- Bruntland Report, 1987

World Commission on Environment and Development. *Our Common Future.* New York : Oxford University Press, 1987. (p.43)

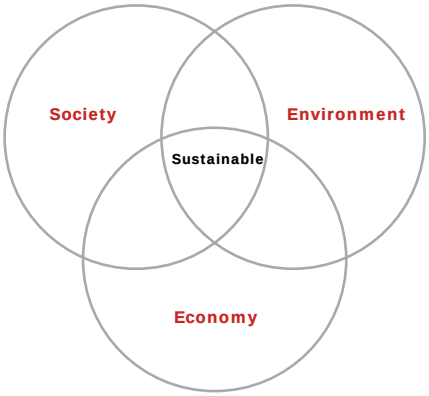
The concepts which underlie the term sustainable development were already present at the beginning of the 20th century in a publication of the Canadian Commission of Conservation:

> *We are prosperous now, but we must not forget that it is just as important that our descendants should be prosperous in their turn. Each generation is entitled to the interest on the natural capital but the principal should be handed on unimpaired.*
>
> -Office of the Auditor General of Canada

Written in 1915, some 72 years before the Brundtland Commission, it refers to the same basic intergenerational notion, using the term "descendants" instead of "future generations." Nevertheless, the Commission was dissolved in 1921. Despite the fact that during the sixties there were publications condemning specific industries and practices, such as Carson's Silent Spring. It was not until the early 1970's that development was really put into question at an international level.

In 1972, the results of a "Project on the Predicament of Mankind" was published by the Club of Rome. The final report is entitled The Limits to Growth. This publication seems to be a turning point at which a conscious decision was taken to strive for ecological and economic stability. The report warned that ignoring the need to change present growth patterns would lead to a doomsday scenario – "sudden uncontrollable decline in both population and industrial capacity." The importance of this publication led us to choose it as a starting point for creating our partial inventory of the definitions of sustainable development from 1972 to the present day. The following is a selection of definitions that describe the main transformations seen in the sustainable development discourse. A number of critiques and comments are also presented to give depth to the context in which these transformations occurred.

The three spheres of sustainable development



City of Montréal. *Montréal's First Strategic Plan for Sustainable Development.* Summary Report. Montréal, April 2005

Definitions: These are statements which explicitly describe the meaning and significance of sustainable development.

Commentaries: These are opinions regarding the discourse on sustainable development.

1972

Our conclusions are:

1. If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be rather sudden and uncontrollable decline in both population and industrial capacity.

2. It is possible to alter these growth trends and to establish a condition of **ecological and economic stability that is sustainable far into the future.** The state of global equilibrium could be designed so that the basic material needs of each person on earth are satisfied and each person has an equal opportunity to realize his individual human potential.

3. If the world's people decide to strive for this second outcome rather than the first, the sooner they begin working to attain it, the greater will be their chances of success.

Meadows, Donella H., Dennis L. Meadows, Jorgen Randers, William W. Behrens III. *The Limits to Growth.* New York: Universe Books, 1972. (p.23-24)

1980

Sustainable development – development that is likely to achieve lasting **satisfaction of human needs** and improvement of the quality of human life.

Prescott-Allen, Robert. *How to Save the world : Strategy for World Conservation.* London: Kogan Page, 1980. (p.23)

1986

What we term 'sustainability' was a reality inherent in many preindustrial cultures. It was usually built into their beliefs, their practices, and the design of their environment. **Sustainability is inherent in what earlier people – and many people today – hold sacred**, and yet, it has been dismissed, ignored, and desecrated by the idea of progress.

Van der Ryn, Sim and Peter Calthorpe. S*ustainable Communities : A New Design Synthesis for Cities, Suburbs and Towns.* San Francisco: Sierra Club Books, 1986. (p.iv)

1987

Sustainable development is here defined as a pattern of social and structural economic transformations (i.e. 'development') which optimizes the economic and societal benefits available in the present, without jeopardizing the likely potential for similar benefits in the future. A primary goal of sustainable development is to achieve a reasonable (however defined) and **equitably distributed level of economic well-being** that can be perpetuated continually for many human generations.

Goodland, Robert and G. Ledec. "Neoclassical economics and principles of sustainable development." *Ecological Modelling* 38 (1987) : (p.36-9)

The concept of sustainable development does imply limits – not absolute limits but limitations imposed by the present state of technology and social limitations on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth. (p.8)

Yet in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. We do not pretend that the process is easy or straightforward. Painful choices have to be made. Thus, in the final analysis, sustainable development must rest on political will. (p.9)

World Commission on Environment and Development. *Our Common Future.* New York : Oxford University Press, 1987.

1990

Il importe d'abord de préciser le sens que nous accordions à la notion de développement viable que nous utilisons tout au long de cette étude. En effet, viable nous semble convenir beaucoup mieux au milieu urbain durable, cette dernière notion connotant trop exclusivement l'idée de durée ou de stabilité et pas assez l'idée de qualité. Au sens littéral, viable veut dire : qui présente les conditions nécessaires pour durer et se développer.

L'étude se veut d'abord une large réflexion sur un modèle de développement urbain dans la perspective du développement viable, c'est-à-dire **un développement urbain qui évite le gaspillage des ressources de l'environnement bâti et naturel, qui est capable de répondre aux besoins fondamentaux** (de santé, de sécurité physique et économique, de confort et d'agrément, etc.) **des populations résidantes actuelles et futures**, et cela dans un cadre de vie de qualité.

Gaudreau, Marcel and Pierre J. Hamel. *Le développement urbain viable à Montréal : Quelques avenues de réflexion et d'action.* Montréal : INRS-Urbanisation, 1990. (p.1)

This is not simply a new approach to development, but a new way of conceptualizing development – a new paradigm. Principally, it is one which recognizes that sustainability lies in those places where the three central themes of community, equity and environment/ economy come together. Conventional economic development, as we know it, has always assumed an open-ended, linear system with a limitless supply of inputs. The result has been an overwhelming emphasis on growth and productivity and a systematic 'forgetting" of environmental and social costs. Sustainable development assumes a cyclical system, in which socio-economic and environmental inputs and outcomes are fundamentally related.

Wismer, Susan. "Assessing Sustainable Development in an Urban Context." *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers.* Ed. Mary Ann Beavis. University of Winnipeg: Institute of Urban Studies, 1990. (p.7)

The concept of "sustainable development," popularized by the release of the Brundtland Commission report, involves the notion of economic growth that not only does not undermine the environment, but even enhances it (**environmentally sustainable economic development**). It implies that value lies not only in economic prosperity, but in the human health, safety and aesthetic appreciation that life in harmony with nature offers. Sustainable development, then, is an ethical notion, in that it is concerned with human and environmental good.

Beavis, Mary Ann, ed."Introduction" *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers.* University of Winnipeg: Institute of Urban Studies, 1990. (p.1)

1992

Principle 1
Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Principle 4
In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

United Nations Environment Programme. "Principle 1 & 4." *Rio Declaration on Environment and Development.* 3 to 14 June 1992. Source accessed: August 28th, 2004. Keywords: Rio Declaration.
http://www.unep.org/.

1993

The notions of sustainable development and sustainability have been much debated, but these concepts are often at odds with each other as development is often interpreted as increased production and consumption, but sustainability must also be ecologically and socially benign.

Banister, David. "Policy Responses in the UK." *Transport, the Environment and Sustainable Development.* Editors David Banister & Kenneth Button. London: E & FN Spon: 1993. (p.72)

1996

By sustainable, we mean the maintenance of the **ecological health of our neighbourhoods** and the provision of equitable access to affordable housing for our children.

Condon, Patrick M. ed. *Sustainable Urban Landscapes: The Surrey Design Charette.* Vancouver: University of British Columbia Press, 1996. (p.11)

1998

… There is this concept of '**away**'. That you could throw something away. Well away has gone away. The Californians are going to Washington, the Washingtonians are going to Alaska, the Eskimos are nervous. **There is no 'away'.** (p.46)

Sustainability is really a shibboleth. It's just a code word for maintenance. It's not going to help us. Sustainability is the edge, halfway between destruction and restoration. Sustainability is not that interesting. Just maintain what we've got now. We actually have to go into what we call a restorative agenda. Because we've been in a destructive agenda for so long we actually have to start restoring. (p.49)

McDonough, William. "Declaration of Interdepence." *Dimensions of sustainability.* Ed. Andrew Scott. New York : E & FN Spon, 1998.

1999

The diversity of short-term needs and concerns, as well as the long-term goals throughout the world, suggests that there is no universally 'correct' or 'wrong' sustainable development. **Sustainable development is a flexible and meliorative concept, which indicates directions for solutions** (Van Ast and Geerlings, 1995; Hafkamp, 1996). Depending on the perceived risks and uncertainties it is possible to make a distinction between 'weak' and 'strong' solutions. Reconciling the various concepts and operationalising them in a practical approach as a means to achieve sustainable development is a challenging task.

Geerlings, Harry. Meeting the Challenge of Sustainable Mobility: The Role of Technological Innovations. Berlin: Springer, 1999. (p.27)

2000

Despite its oxymoronic construction the term 'sustainable development' does convey a meaning of sorts, but in operational terms it has already been overtaken by the much more amorphous and dangerous single word 'sustainability', a word so new that it does not even appear in the electronic dictionary of Microsoft Word 2000. As a result it has innumerable meanings, all of which are unclear. In one sense it poses as a distant goal, the Shangri-la of sustainable development – the state of sustainability – in another it will present itself as a moral good. (p. 43)

In its present form sustainability is neither a creative nor a technical vision. All that is known about it is that it is a good thing, supported by the highest and lowest in the land and supposed by almost everybody to require no further justification than their allegiance. **In reality it is certain only of its own end – that development should evolve so that development can continue, and such finalism in the end offers no answer to anything.** Or rather it offers tautologies that purport to be answers. (p. 44)

Pawley, Martin. "Martin Pawley agues the case against the environmental agenda." *Architect's Journal. 212:1*. July 6, 2000.

2002

The notion of sustainable development is based on an awareness of environmental risk. However, it is also a social project which seeks to reconcile ecological, economic and social factors. It goes hand in hand with the basic principles of environmental law:

- precaution
- prevention
- remedy at source
-"polluter pays"
- use of the best available technology

Gauzin-Müller, Dominique. *Sustainable Architecture and Urbanism.* Berlin: Birkhäuser, 2002. (p.13)

> ... 'sustainable development' and 'sustainability'. Both are contentious. Their scope extends beyond the built environment and are now **firmly embedded in the socio-political arena**. Their ascendancy has been rapid, while various definitions fail to satisfy critics...If we view the terms as absolute, a building development either being sustainable or not sustainable, we run into difficulty. The Bruntland definition, 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs', leaves much scope for interpretation. '**Need**' invokes some course of action; '**meeting**' can imply intersection of movement in opposite directions; '**compromise**' may be defined as exposing liability to harm by injudicious action; and '**ability**' as adequate capacity to do something. The solution to the conundrum of sustainable development must lie in accepting the **reality of relativity and shifting boundaries**. (p.ix-x)
>
> Porteous, Colin. *The New Eco-Architecture: Alternatives from the Modern Movement.* New York: Spon Press, 2002.

Role of International Institutions:

157. Strengthening of the international institutional framework for sustainable development is an evolutionary process. It is necessary to keep relevant arrangements under review; identify gaps; eliminate duplication of functions; and continue to strive for greater integration, efficiency and coordination of the economic, social and environmental dimensions of sustainable development aiming at the implementation of Agenda 21.

United Nations. *Report of the World Summit on Sustainable Development*. Johannesburg Summit 2002, South Africa, 26 August- 4 September 2002. ISBN 92-1-104521-5. (p.70) http://daccessdds.un.org/doc/UNDOC/GEN/N02/636/93/PDF/N0263693.pdf?OpenElement. (Accessed on 30/08/2006).

2004

A 'sustainable city' enables all its citizens to meet their own needs and to enhance their well-being, without degrading the natural world or the lives of other people, now or in the future.

Giradet, Herbert. *Cities People Planet*. Chichester: Wiley-Academy, 2004. (p.6)

The Brundtland Commission interprets sustainability as 'meeting the needs of the present without compromising the ability of future generations to meet their own'. The World Business Council on Sustainable Development defines it as (involving) 'the simultaneous pursuit of economic prosperity, environmental quality and social equity.' Such essentially homocentric interpretations, however, indicate the ultimate need for an ethic that recognizes the interdependence of all life forms and the maintenance of biological diversity.

Hough, Michael. *Cities and Natural Process: A Basis for Sustainability.* 2nd. Ed. New York: Routledge, 2004. (p.5)

- For a 'renewable resource' - soil, water, forest, fish -- the sustainable rate of use can be no greater than the rate of regeneration of its source. (Thus, for example, fish are harvested unsustainably when they are caught at a rate greater than the rate of growth of the remaining fish population.)
- For a 'nonrenewable resource'- fossil fuel, high-grade mineral ores, fossil groundwater - the sustainable rate of use can be no greater that the rate at which a renewable resource, used sustainably, can be substituted for it. (For example, an oil deposit would be used sustainably if part of the profits from it were systematically invested in wind farms, photovoltaic arrays, and tree planting, so that when the oil is gone, an equivalent stream of renewable energy is still available.)
- For a 'pollutant' the sustainable rate of emission can be no greater than the rate at which that pollutant can be recycled, absorbed, or rendered harmless in its sink. (For example, sewage can be put into a stream or lake or underground aquifer sustainably no faster than bacteria and other organisms can absorb its nutrients without themselves overwhelming and destabilizing the aquatic ecosystem.)

Daly, Herman. "Toward Some Operational Principles of Sustainable Development." *Ecological Economics* 2 (1990): 1-6, cited in Donella Meadows, Jorgen Randers and Dennis Meadows. Limits to growth: the 30 year update. Vermont: Chelsea Green Publishing Company, 2004. (p.54)

Sustainable design is a design philosophy that seeks to **maximize the quality** of the built environment, while **minimizing** or eliminating **negative impact** to the natural environment. (p.4)

> **In the dictionary the word sustainable is defined as something that is "able to be maintained," which doesn't accurately portray the need to change the way we relate to the natural world. Much better words could have been chosen such as restorative design to imply the challenge ahead or ecological design to highlight the main focus of the philosophy.** (p.2-3)
>
> McLennan, Jason F. The Philosophy of Sustainable Design: The Future of Architecture. Kansas City: Ecotone, 2004.

2005

On parle donc de développement durable pour décrire des modes de développement économique qui ménageraient mieux les grands équilibres naturels, notamment en réduisant la consommation d'énergies fossiles et donc l'émission dans l'atmosphère de gaz carbonique, principal gaz à effet de serre. ... En fait, la notion de développement durable suppose une transformation profonde des mentalités. Les considérations écologiques devraient prendre autant de place que les approches économiques classiques. Les problèmes devraient être traités à toutes les échelles, mais **avec un souci permanent des grands équilibres écologiques mondiaux.** Bref, il suppose le développement d'une véritable "écologie politique".

Merlin, Pierre and Françoise Choay. "Développement Durable." *Dictionnaire de l'urbanisme et de l'aménagement.* Paris: Presses Universitaire de France,: 2005.

2006

> **"In a certain sense, if one rationally considers the cumulative effects of Hiroshima, Chernobyl, the holes in the ozone over Antarctica, and the countless environmental traumas that have occurred during the twentieth century, it would not be too preposterous to conclude that the ecological apocalypse has already occurred."**
>
> Ingersoll, Richard. *Sprawltown: Looking for the City on its Edges.* New York: Princeton Architectural Press, 2006. (p.133)

Développement durable: processus continu d'amélioration des conditions d'existence des populations actuelles qui ne compromet pas la capacité des générations futures de faire de même et qui intègre harmonieusement les dimensions **environnementale, sociale et économique du développement.**

Ministère de l'environnement du Québec. Nov. 2004. Plan de développement durable du Québec : Document de consultation. Source accessed July 2006. (p.19) http://www.mddep.gouv.qc.ca/developpement/2004-2007/plan-consultation.pdf

Summary

1970's

The 1970s is a decade where ecological awareness increases. The Bretton Woods Development Model is questioned and the prediction of a dark future begins to emerge. Despite this polemic of development at the cost of the environment, the term "sustainable development" is not used in many publications.

1980's

A more optimistic perspective towards sustainable development is the main change observed during the 1980s. The doomsday scenario given by the Club of Rome disappears, but a strong emphasis on development of the "Third World" or "Developing" countries is also present.

1990's

The term "sustainable development" becomes a very popular concept in the 1990s. Concurrently, a series of new terms -- sustainability, éco-development, développement viable, human development -- arise. However, questions about the nature and use of the term begin to surface. How could economic growth, an open-ended linear system with a limitless supply of inputs be intertwined with ecological systems which are closed, cyclical systems? Why is the term limited to an anthropocentric perspective?

2000's

In the current decade both terms "sustainability" and "sustainable development" are prevalent, but still contentious. On the one hand, they are interpreted as ameliorative terms which indicate orientations for solutions. On the other hand, they are construed as oxymoronic and new agendas such as Latouche's l'après développement are put forward. Regardless of problems with the term sustainable development, most governmental institutions are using it.

Aporia

In the period we have explored, the definition of sustainable development has not unfolded logically and transformed itself as drastically as one may have expected. The critique and counter-critique has not given much direction to the definition, which remains vague and difficult to interpret.

From a general perspective, it is clear the debate on this concept has slowly extended from international bodies to a multiplicity of local actors. In the process it has been politically neutralized. Critique of the concept is aimed at the fact that it tries to integrate a cyclical ecological model with a linear economic model. Naturally, the debate remains as to whether we are capable of creating a hybrid model.

Additionally, problems of scale and power come to the forefront. The classic switch from fossil fuel to hydrogen vehicle transport exemplifies the dilemma. In this case, the energy used has become a more sustainable in relation to the present state of affairs. However, it does not put into question the larger system within which the vehicle is operating, namely one of attempting to continuously move both people and goods farther and faster, resulting in a breakdown of self-sufficiency at the local scale.

Part One: Works Cited

Introduction

Emmett, Brian. Office of the Auditor General of Canada. "Introduction - The Sustainable Development Challenge." *Moving Up the Learning Curve. The Second Generation of Sustainable Development Strategies.* October 14, 2004. http://www.oag-bvg.gc.ca/domino/cesd_cedd.nsf/html/c9dec_e.html. [Accessed July 16, 2006.]

Meadows, Donella H. et al. *The Limits to Growth: a report for the Club of Rome's project on the predicament of mankind*. 2nd ed. New York: Universe Books, 1982.

A Genealogy of Sustainable Development

Refer to in text citations.

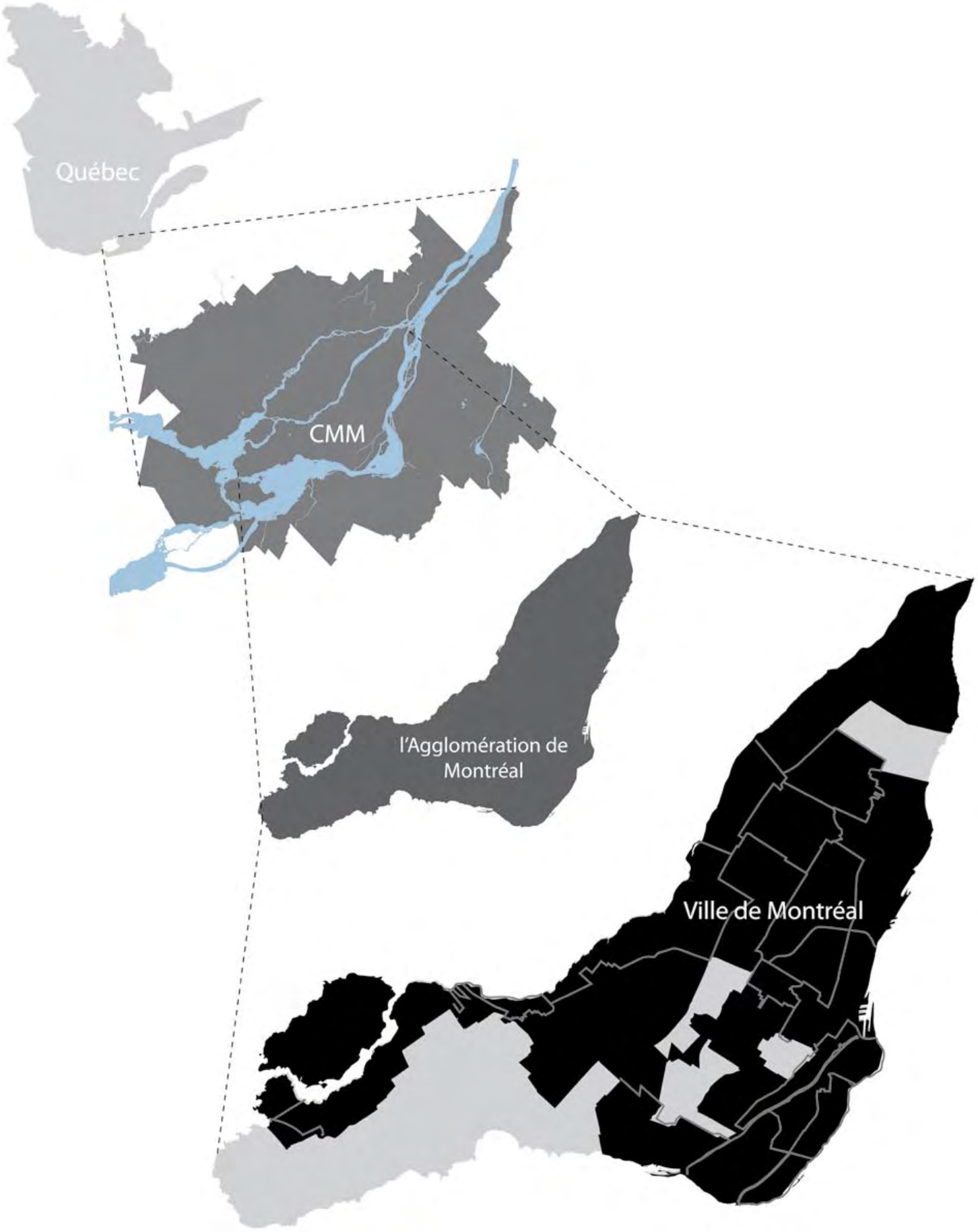
Source: © 2003. Government of Canada with permission from Natural Resources Canada

Part Two: What is Montréal?

The first part of this document analyzed the dynamics of the concept of sustainable development, its direction, and its evolution. The second part of this section explores Montréal from the perspective of several themes commonly associated with sustainable development.

Before exploring change, innovation, or adjustment in respect to the City of Montréal's approach to sustainable development, the initial state of affairs should be established. Furthermore, it is important to know what the relationship is between Montréal and its supporting environment. In short, examining sustainable development requires defining the object/artefact/idea/system being investigated. Therefore, one basic question emerges: What is Montréal?

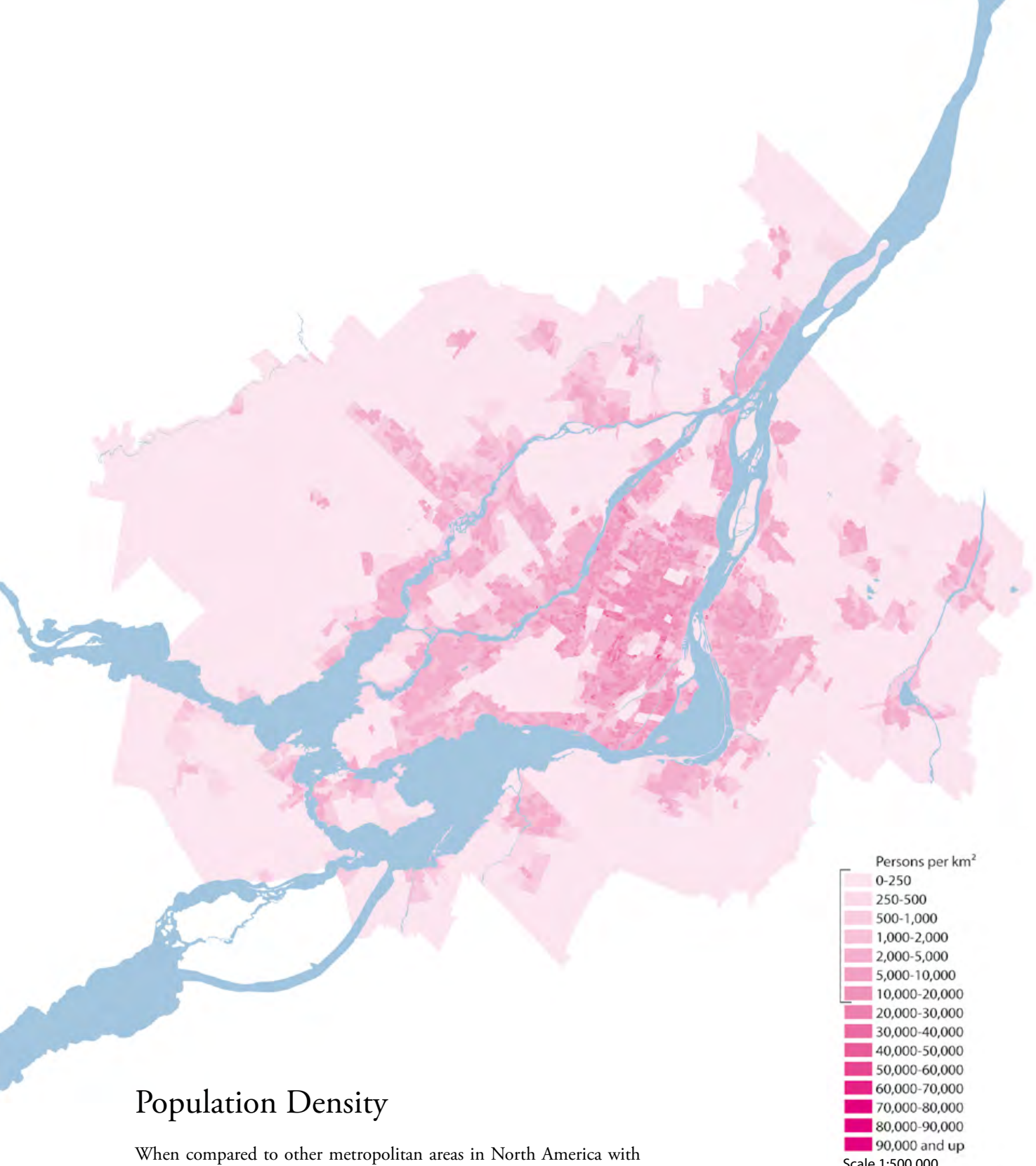
According to the Communauté métropolitaine de Montréal (CMM), the greater Montréal area accounts for 48% of the total provincial population, 49 % of total employment, 50% of the province's gross domestic product, $25 billion in revenue for the provincial government, 53% of private capital spending, 73% of venture capital invested provincially, and 46% of all manufacturing shipments. Clearly, a multiplicity of variables, factors and opinions could be taken to express "what" Montréal is. However, the scope of this second section is limited to seven broad themes: demographics (more specifically population density, language, income, immigration and housing type), land use, transportation, water, energy, food, and waste. For each theme, a brief portrait of Montréal, including the fundamental details pertinent to that theme, is presented.


Québec
CMM
l'Agglomération de Montréal
Ville de Montréal

Montréal's Multiple Faces

In connecting the idea of sustainable development, as explored in the first section, to a geographical place, it immediately became apparent that simply drawing lines around the City of Montréal and studying what was happening inside those boundaries was to circumvent the key issue of scale. Cities are organized as part of a larger regional network and divided into boroughs and subdivided in neighbourhoods. As these entities expand, they do not necessarily respect the political boundaries pre-assigned to them. Cultural and historical factors are sometimes the cause for certain borders to appear or disappear between a district and a neighbourhood. Economic factors and municipal budgets can also determine other modes of operation and management. The City of Montréal, like many other Canadian cities, has undergone many political changes. Most recently, in 2001 the municipalities on the Island of Montréal were merged into one large city. As part of the merger, provincial powers created the Communauté métropolitaine de Montréal (CMM) a regional organization to administer five main regions: Couronne Nord, Laval, l'Ile de Montréal, Couronne Sud, and Longueuil.

In 2003, the Parti Libéral du Québec won the provincial elections. Fulfilling a campaign promise, referenda were organized across the province, allowing citizens to voice their opinions concerning the mergers imposed by the previous government. On the Island of Montréal the result was that 15 municipalities regained their independence. The post-dissolution City of Montréal (divided into 19 boroughs) has a territory of 366.02 km² (141.3 sq. miles) and a population of 1,583,590 inhabitants. This means a net increase of 96.8% in land area, and 52.3% in population, between the pre-merger and post-demerger Montréal. Many of the administrative powers have remained in the hands of an island wide administration referred to as the Agglomeration Council, and the regional body of the CMM still pursues it mandate. Presently, the territory is administered by multiple levels of government which all come into play in the process of putting sustainable development into operation.



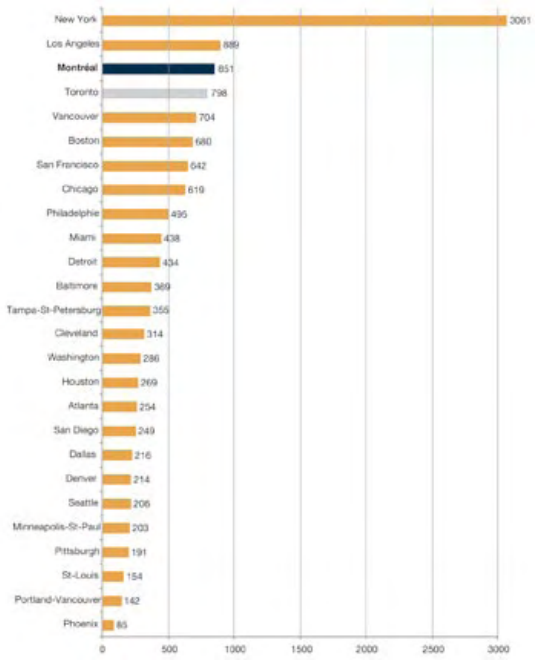
Scale 1:500,000

Sources: DMTI Spatial; Statistics Canada; CanMap Streetfiles.

Population Density

When compared to other metropolitan areas in North America with populations over two million, Montréal has the third highest average density, and ranks first in Canada. In the central city and on the east side of the island of Montréal, population densities are generally quite high. Densities then decline sharply on the west side of the island. Off of the island the densities are lower still. They are slightly higher along the shorelines before tapering to rural densities inland.

Demographics



In a study of population densities of 26 Metropolitan Areas with populations over 2 million, the Montréal CMA at 851 people/km^2 ranks 3rd behind New York 3061, and L.A. at 889. Toronto is ranked 4th at a density of 796 people/km^2.

Source: Communauté métropolitaine de Montréal.

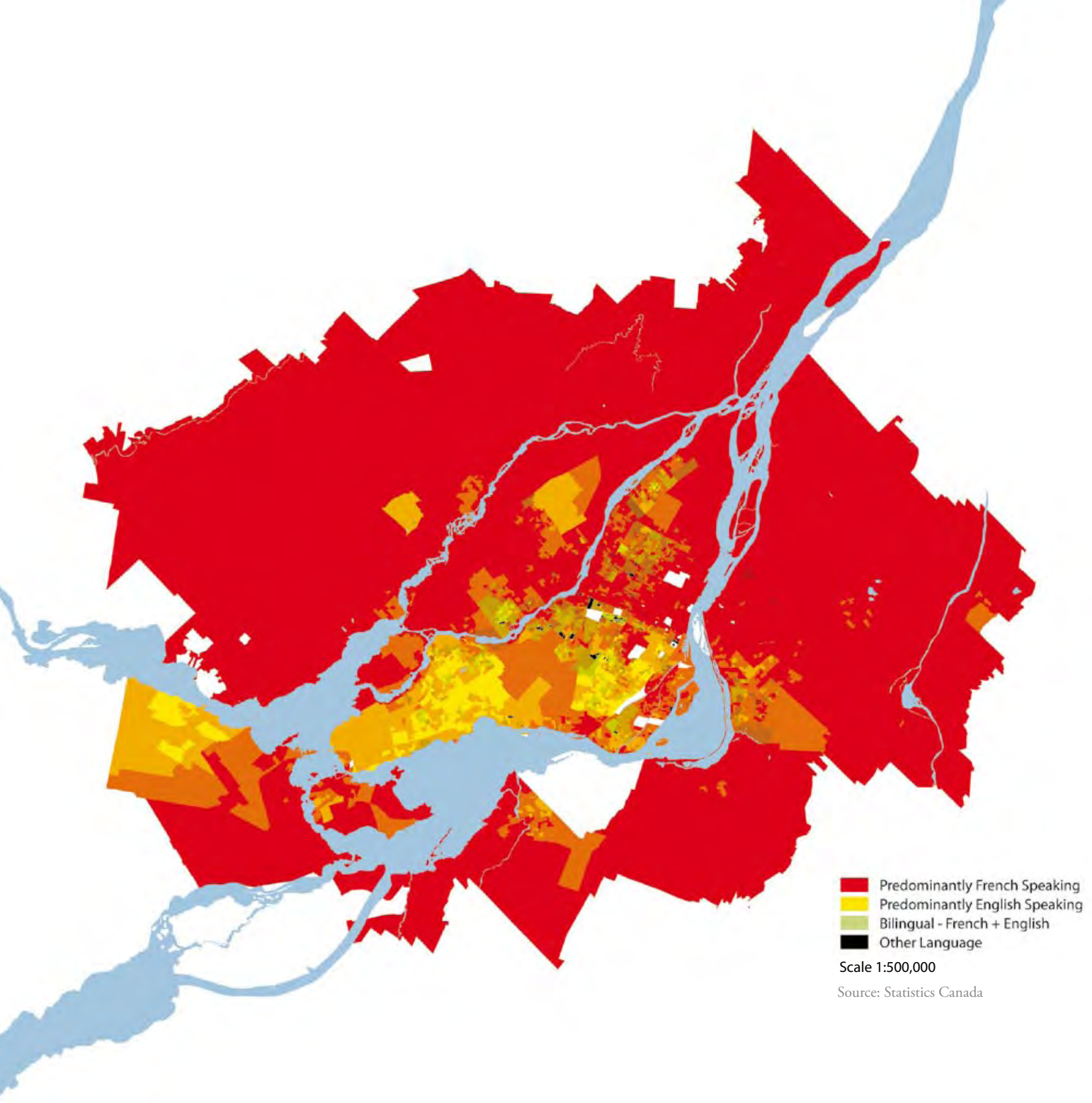
A demographic analysis of Montréal presents a distinction between the Island of Montréal and the rest of the metropolitan region. Having developed over centuries as opposed to decades, the older part of the city tends to have more variety, density, and generally a finer urban grain.

There are a few facts unique to Montréal. On average, it is the densest metropolitan area in Canada. The Island of Montréal has the highest student-per-capita ratio in the country and a higher proportion of seniors than the provincial and national averages. Both of these categories are growing and combined with an increasing proportion of female employment are contributing to a declining household size.

Compared to other major urban centres, Montréal has lower average individual and household incomes. Over fifty percent of the metropolitan population are tenants. This figure is in decline due to high levels of exurban growth, which results in an increasing proportion of home ownership.

Note: The five demographic thematic maps have been generated using Geographic Information Systems (G.I.S.) software, and census data from DMTI Spatial Inc. and Statistics Canada. Thematic mapping presents average values for individual dissemination areas, which vary in size and shape depending on population.

Sources: Tomalty, Ray and Don Alexander; Guenther, Paul et al.

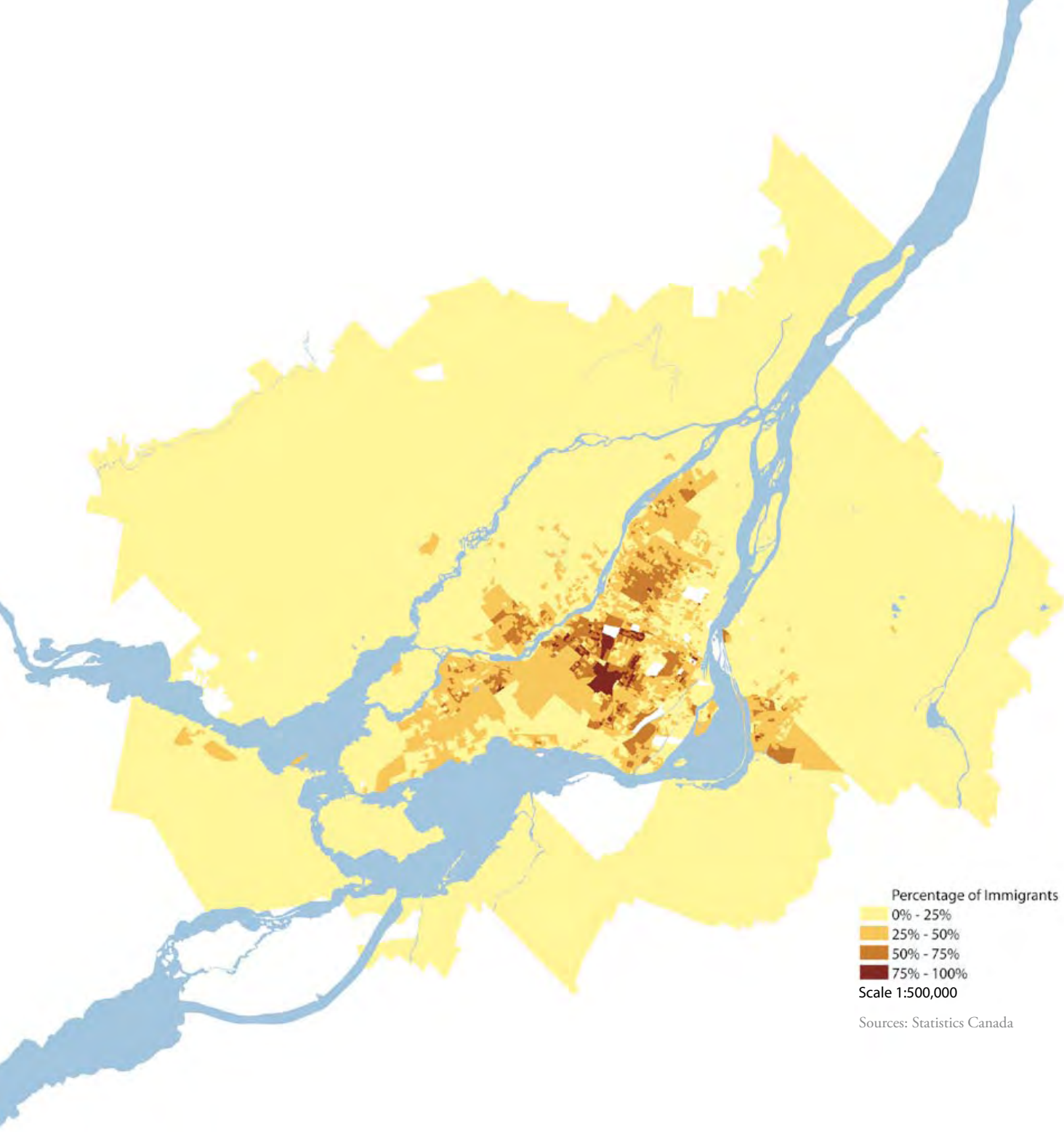


Source: Statistics Canada

Language

French is certainly the dominant language in Montréal. However, averaged across the whole Metropolitan region, 14.7% of residents speak languages other than French at home. The 2001 census showed that on the island of Montréal, only 54% of households spoke French at home. As the central part of the city continues to attract international immigrants, it is likely that the language distribution will continue to diversify.

Sources: Communauté métropolitainede Montréal; Tomalty, Ray (p.138)

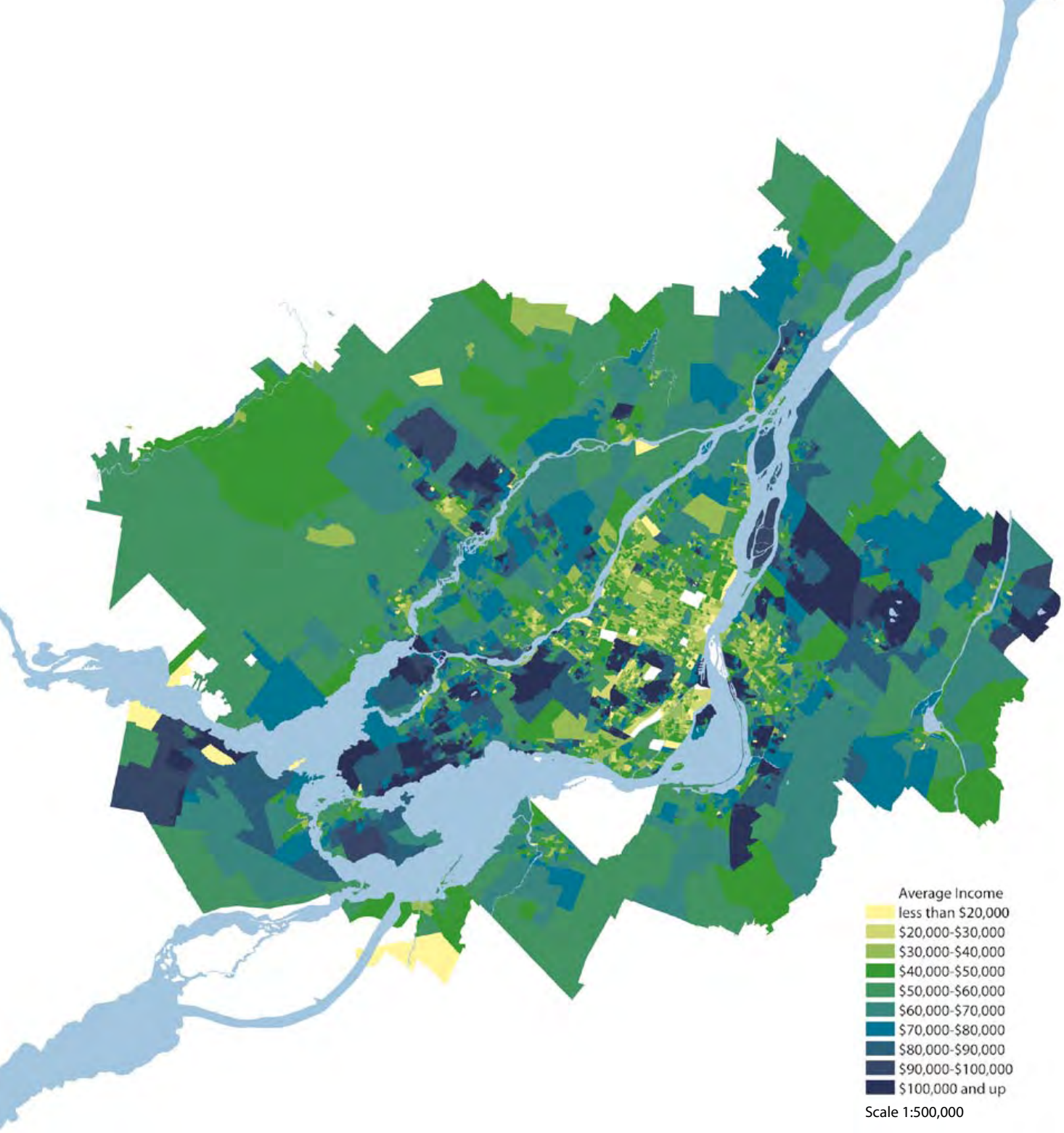


Sources: Statistics Canada

Immigration

Over 56% of growth in the metropolitan region is due to immigration from other provinces and countries. This condition is common in Canada as fertility rates are not high enough to sustain the population naturally. This new population is mainly moving to the island of Montréal while, at the same time, large numbers of primarily French speaking residents are moving out from the centrally located island to the surrounding municipalities.

Source: Communauté métropolitainede Montréal.

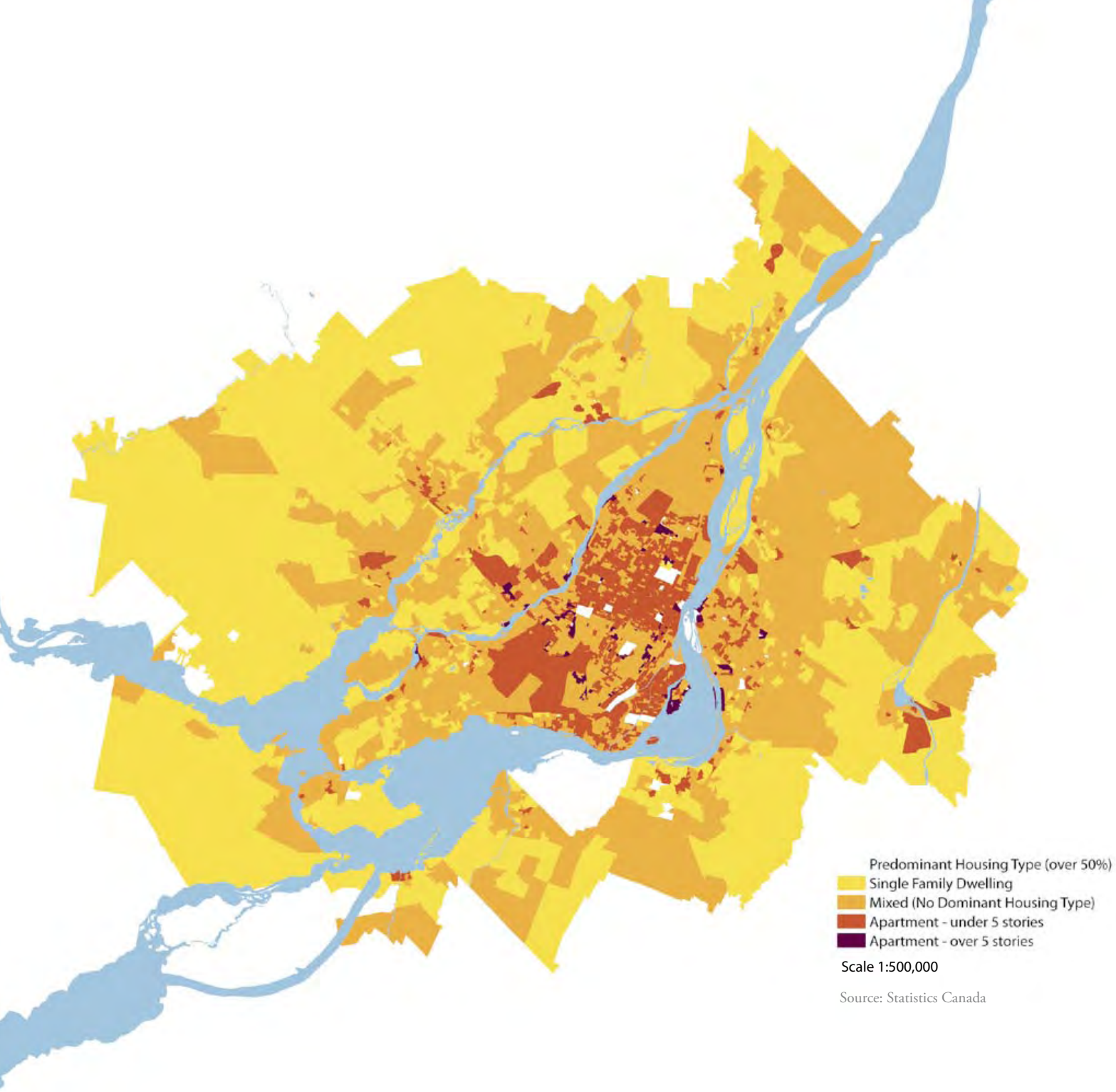


Source: Statistics Canada

Income

Compared to other major urban centres in Canada, the average annual income for both households and individuals in Montréal is quite low. Many of the lower income households are located in the central city, where a high proportion of rental properties are found. As a result of this high proportion, this area is also home to many people who are living in unaffordable housing, that is, they are spending more than 30% of their income on living accommodation.

Source: Guenther, Paul et al.

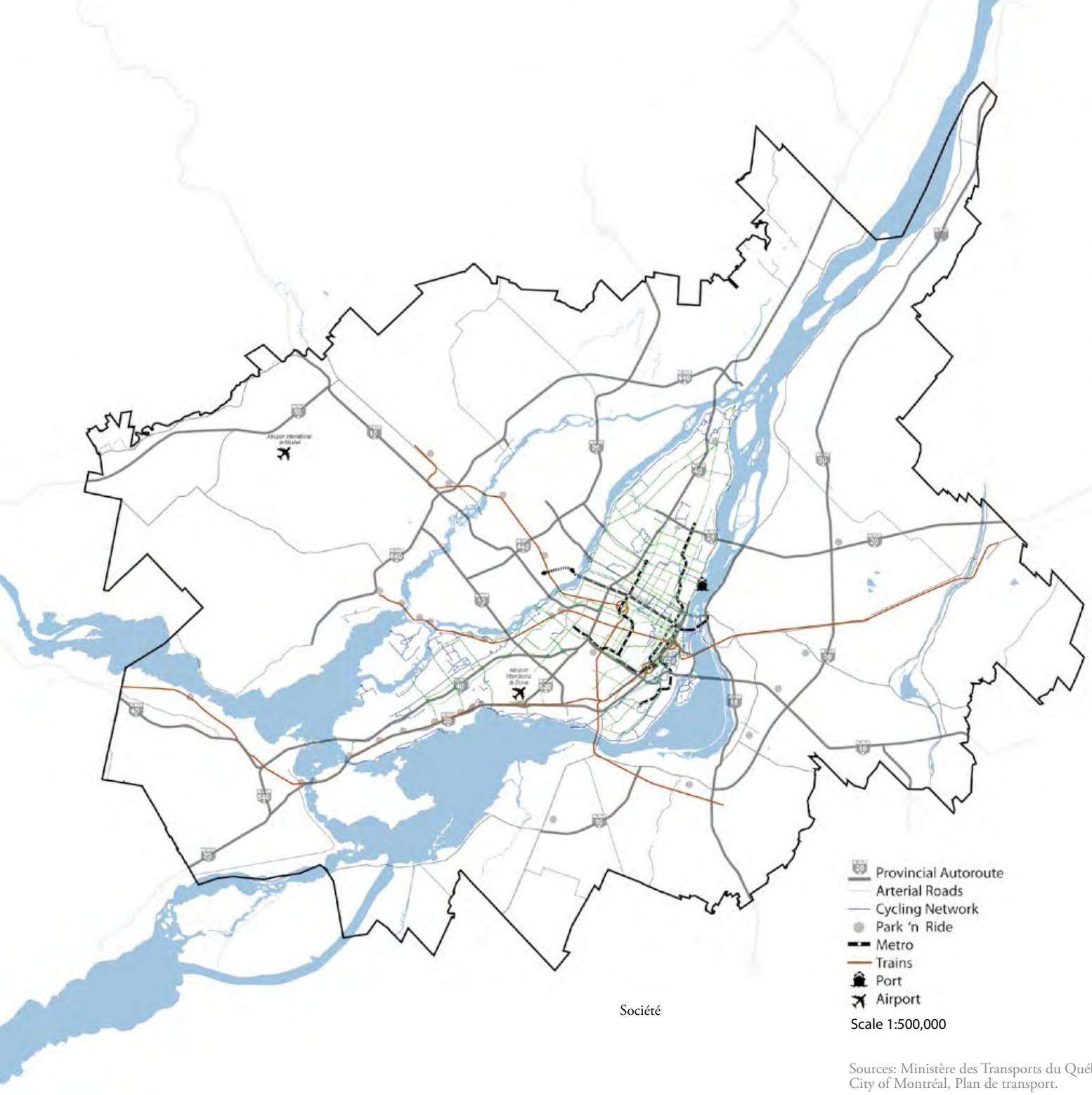


Source: Statistics Canada

Housing Type

In the region of Montréal, single family homes account for just over 30% of the housing stock. Since there is a high proportion of apartment buildings and townhouses, it means that just over half of Montréal's residents are tenants. This figure makes the city unique in Canada, where typically home ownership is much more popular. However, this proportion is changing due to an increasing quantity of detached homes under construction while fewer low-rise apartments are being built.

Sources: Tomalty, Ray (p. 138); Guenther, Paul et al.



Société

Sources: Ministère des Transports du Québec; City of Montréal, Plan de transport.

Transportation Network within the City of Montréal

Arterial Roads	1,000 km
Local Roads	4,200 km
Auto-Routes	200 km
Sidewalks	6,400 km
Cycling Lanes	350 km

Source: City of Montréal, Public Works

Public Transit Agencies in the CMM:

STM – Société de transport de Montréal
AMT – Agence métropolitaine de transport
RTL – Réseau de transport de Longeil
STL – Société de transport de Laval
CIT – Conseils interminicipaux de transport
OMIT – Organismes municipaux et intermunicipaux de transport

Source: City of Montréal, Plan de transport

Transportation

Montréal's transportation network is made up of roads, public transit, and cycling and pedestrian pathways. Budget-wise, Montréal is beginning to invest more on public transit and sustainable modes of transportation that it has in the past. This year in the *Agglomération de Montréal*, spending on public transit will exceed that of roads by over $35 million. Additionally, $4 million has been allotted for the development of sustainable modes of transportation.

Roads

Road infrastructure in Montréal is ageing. Over the next decade the city will need to invest $3.8 billion in it. Congestion on the island is also worsening with the rate of growth of the trip duration far exceeding increases in trip distance.

Public Transit

Public transit consists of the Métro, buses, mini-buses, adapted transit, and collective taxis. Montréal has the distinction of being the city in North America with the lowest monthly public transit fares. In the central city, the system is competitive, time-wise, with car travel. However, trips not to or from downtown take more than three times as long by public transit as by car.

Only 62.4% of the STM is accessible for those with mobility difficulties. However, none of the 65 current Métro stations are accessible. The three new stations planned for Laval will be accessible. However, these stations will bring the line up to maximum ridership during morning rush hour between the Montmorency and Berri-UQAM stops.

Pedestrian and Cycling Networks

The city centre is the area in which most trips are taken by foot. The City of Montréal attributes this to the density and mixed use that characterize this area. For both the pedestrian and cycling networks, safety, consistency, continuity, and upkeep are issues that greatly affect usage.

Montréal is touted as one of the most bikeable cities in North America. However, key pieces are still missing. For example, not being able to take bikes on the metro during rush-hour means that intermodal bike-metro trips are impossible for many workers.

Overall it seems that while many modes of transit occur in the city centre, toward the edges of the island and in the great metropolitan area, personal vehicle use is still the most viable option for many people.

Public Transit in Numbers

The STM, responsible for 83% of public transit trips in the regions, accommodates 363 million trips per year.

Buses
STM : 169 regular lines, 23 rapid lines, 11 bus lanes covering 45.5km
AOT: 200 bus lines that liaison with STM in Montréal, 5 are express

Trains
45 stations, 5 lines, 201km, 36 parking lots with 12 800 spots total

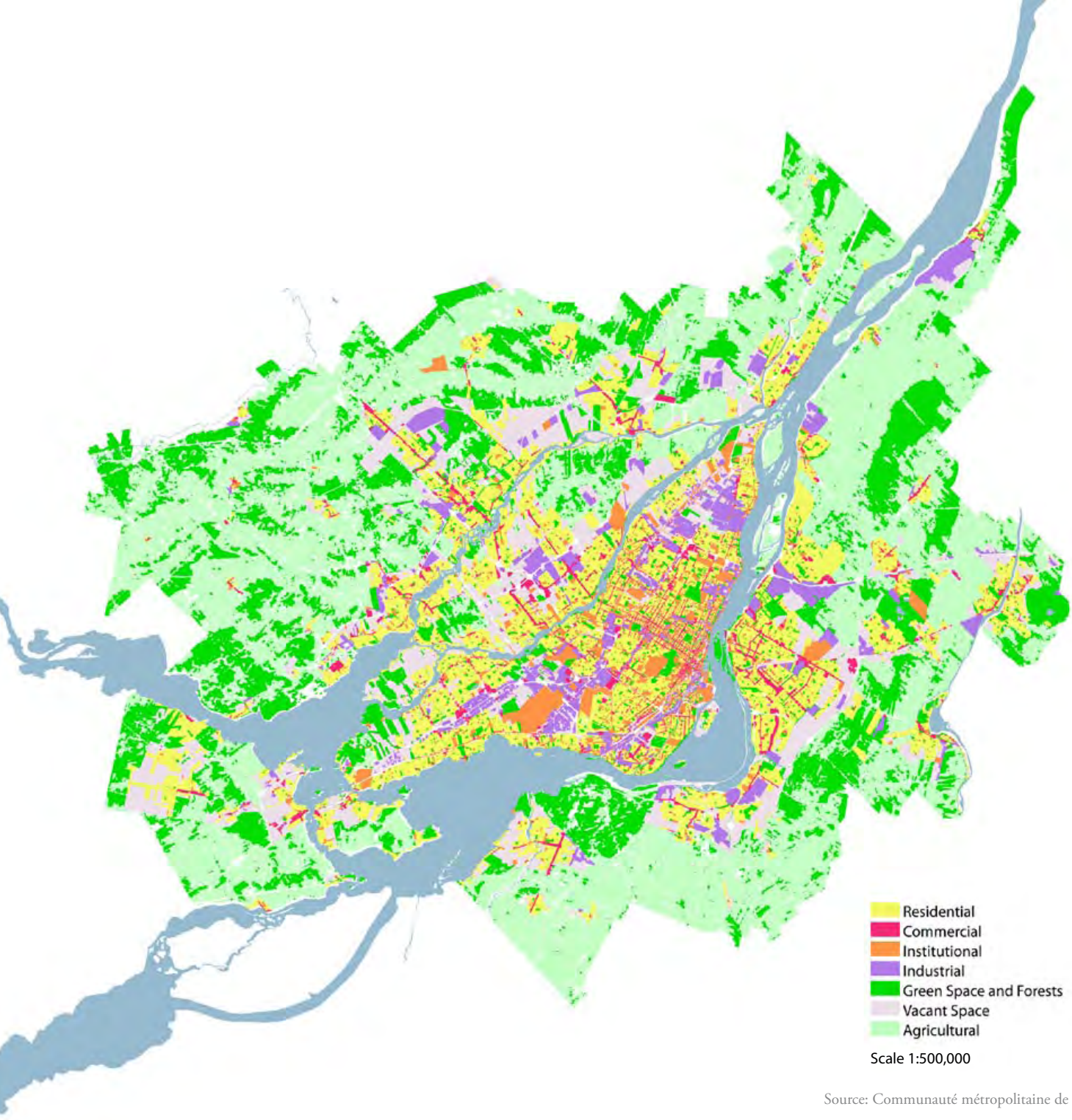
Metro
4 lines, 65 stations, and 66km of tunnels

Public taxis
serve 5 sectors of city of Montréal

Adapted Transit
15 000 clients, 1.5 million trips/year, 6,000 trips/day
93 mini-buses
1,000 taxis are equipped for people of varying mobilities

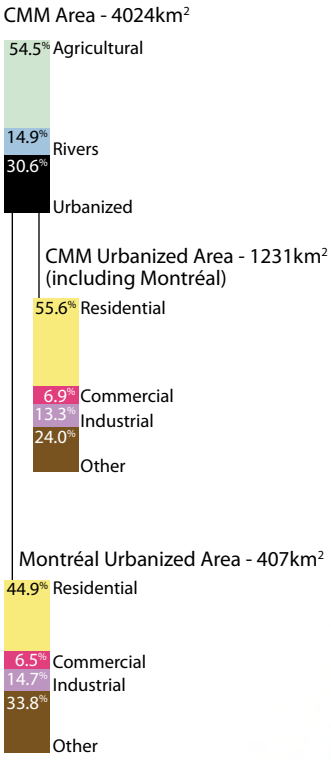
Source: City of Montréal, Plan de transport

Source: City of Montréal, Plan de transport



Source: Communauté métropolitaine de Montréal

Land Use



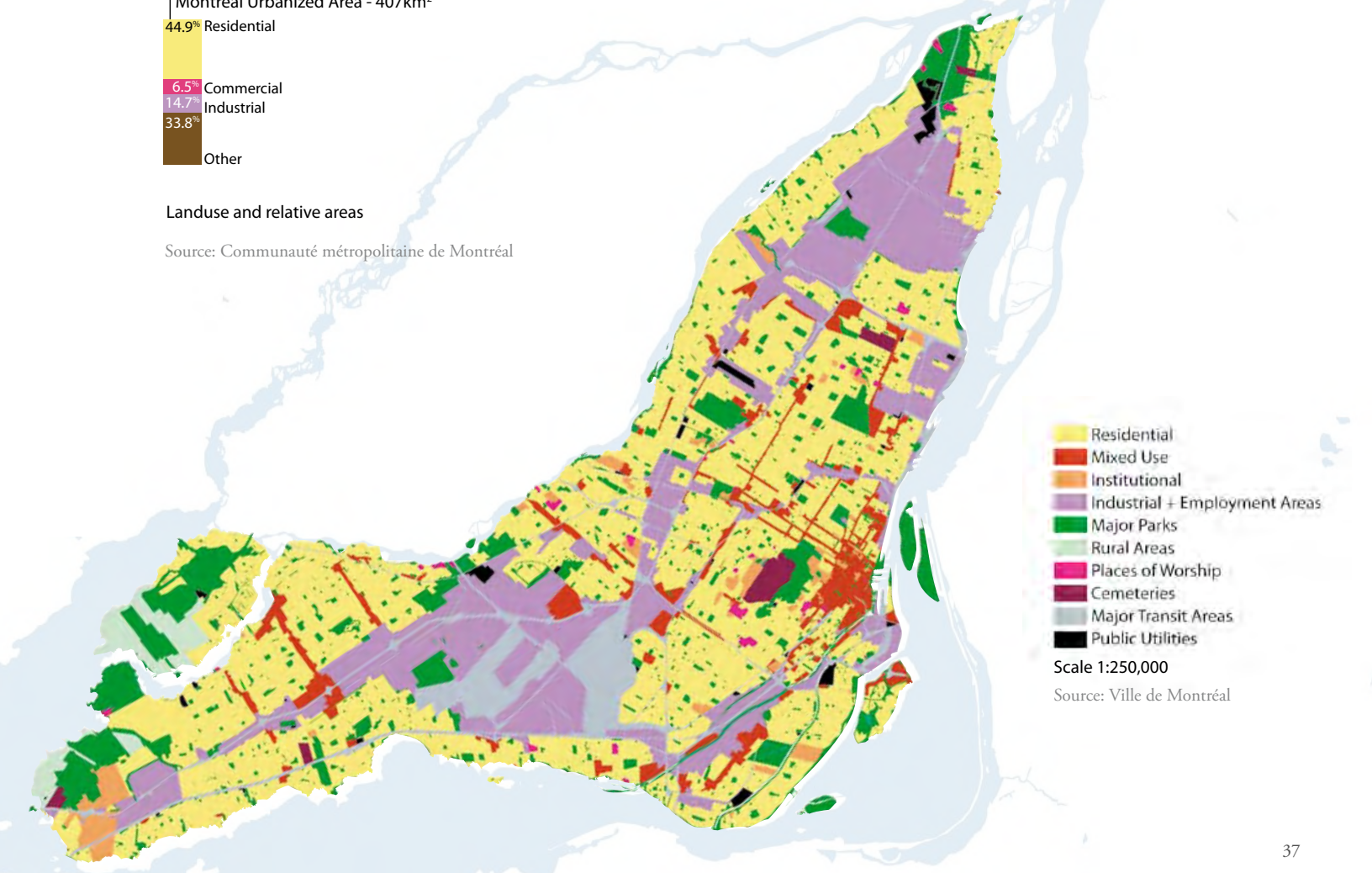
Landuse and relative areas

Source: Communauté métropolitaine de Montréal

The Montréal Metropolitan Region is just over 4000 square kilometers in size. Of that land, 15% is water, 31% is urbanized and the remaining 54 percent is protected for agricultural use.

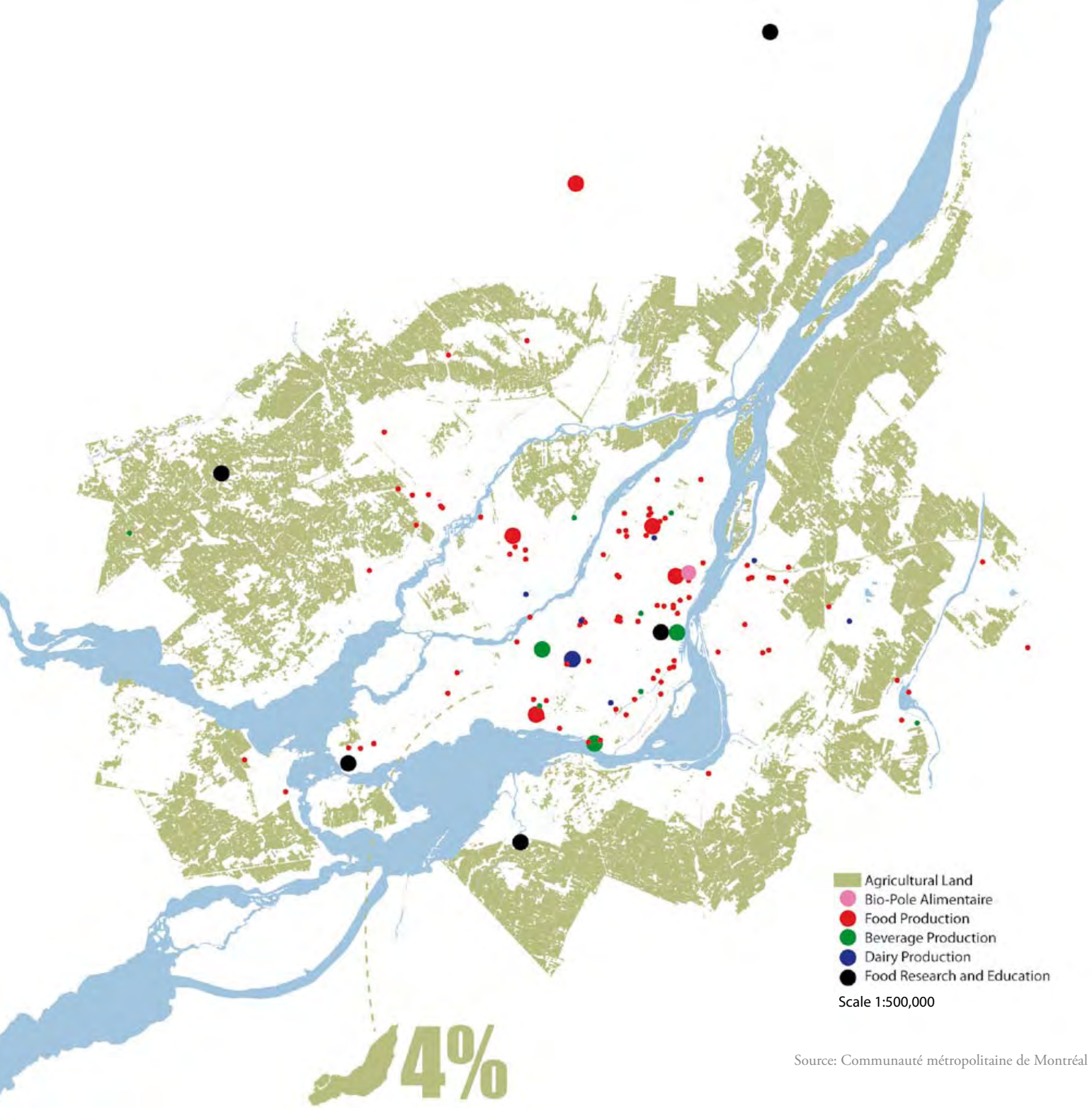
By the 1970's, the Island of Montréal was almost completely urbanized. Since then, development has been moving further from the centre, greatly enlarging the urban footprint of the city. This construction has followed a general pattern that starts at the riverbanks and continues inland away from the rivers. Over 40% of the regions shorelines are urbanized, and aside from the main port near old Montréal, most of the riverside land is occupied by residents, with the major industrial areas located inland.

It is worth noting the contrast in the basic urban patterns found near the core area of Montréal, with the urbanized areas off of the Island. Areas near the core tend to be of a much finer grain with a mix of commercial, residential and institutional uses. Off Island, the grain is much larger, and the uses in these areas tend to be much more homogenous.



Scale 1:250,000

Source: Ville de Montréal



Source: Communauté métropolitaine de Montréal

Food

The food we eat on a daily basis is part of a system linking multiple phases from origin to consumption which involve and transform the urban fabric directly and indirectly. Robert Gottlieb in his book Environmentalism Unbound divides the present day system into five stages: a) planting & growing; b) development of food products; c) marketing; d) selling; and e) consumption of those products. This section is a brief look at these stages in the Montréal context.

Planting & Growing

In the 2001 Agricultural Census, Statistics Canada registered 55 farms on the Island of Montréal. In addition to these production areas, there are some 100 community gardens run by the different municipalities on the island. Tallying these two surface areas, a conservative estimation of the land used for agricultural production on the Island of Montréal nears 1 980 hectares or 4 % of the total Montréal Island surface area. However, the actual area used strictly for food production is 2.37%.

At a regional scale, the Québec Commission for agricultural land protection (Commission de protection du territoire agricole du Québec) indicates 67% of the total Census Metropolitan Area (CMA) of Montréal is designated as agricultural land. Nonetheless, only 50% or 283689 hectares of the CMA area is presently registered as being cultivated by the Québec Ministry of Agriculture. In this respect Montréal is similar to Dallas and St-Louis, while cities like Philadelphia only have 20% of their total areas designated as agricultural land. New York is an extreme example with only 1.5%.

Food Development & Transformation

The strong presence of agricultural production in the region may be responsible for the CIBIM's (Conseil des Industries Bioalimentaires de l'île de Montréal) new project, co-financed by the City of Montréal, the federal government and Saputo. As part of the series of urban renewal centers the construction of a biofood center will begin this year (2006) and hopefully open for business in 2008. This center will be an incubator for businesses in the food processing and production sectors. The idea is to help small local businesses to expand by providing a space with the specialized equipment necessary to develop new ideas and products.

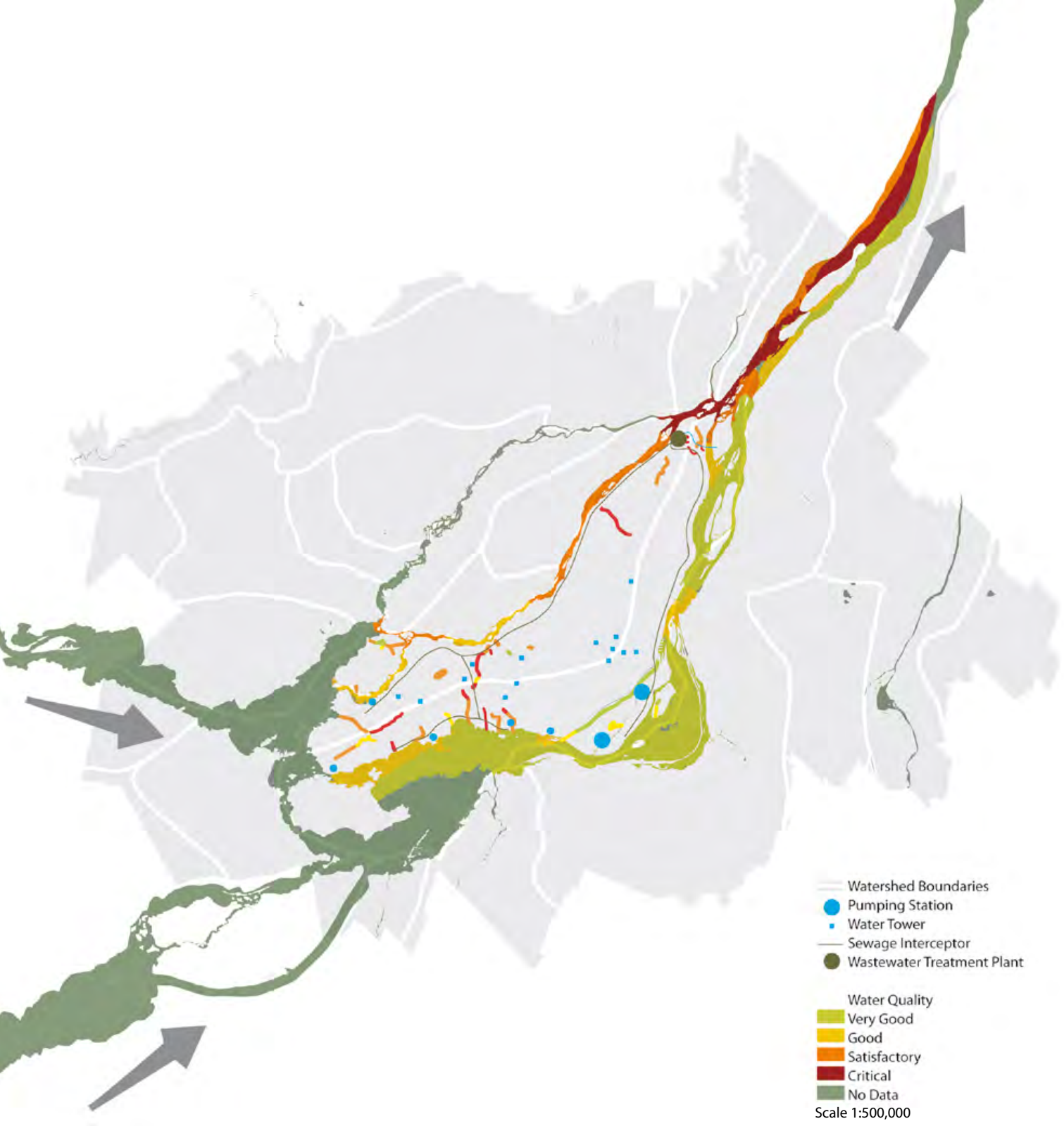
Marketing & Selling

The most important retailers in the city of Montréal demonstrate the dominant power of the now omnipresent supermarket on the urban fabric. Select companies Empire (Loblaws), Metro (Super C, A& P, Marché Richelieu, Food Basics, Marché Sutra, GEM), Sobeys (IGA Extra, IGA Bonichoix, Tradition, Le Dépanneur, Marché Omni, Boni-

Soir) and Couche Tard have radically transformed the city's layout. These food chains have developed supermarket labels that control the flow of food items from production to consumption. This form of organization effectively protects the links between different phases of the food cycle, creating a monopoly. It is very difficult for local producers to compete in this closed supermarket system. Nevertheless, certain farmers in the Montréal area have begun a network of community supported agriculture which provides a direct reciprocal link between producer and consumer. This reflects a trend in the wider North American market which is becoming critical of mass production and increasingly demanding in regards to the quality of produce.

Consumption

Despite having a large expanse of agricultural land, a council dedicated entirely to the issue of the biofood industry, local brokers, processors, manufacturers and retailers, the City of Montréal's food system does not provide for the entire population. Food insecurity remains an issue as Moissan Montréal, one of the largest food banks in Canada, can attest. The CRÉ de Montréal has identified food security as an issue on the island and is presently creating a portrait of the present situation through one of its consultation panels entitled: Nourrir Montréal.



Sources: City of Montréal; Environment Québec

Water

Montréal's water supply is based on a system that connects the city's urban network to a natural river system. Without a doubt water supply is a vital component of urbanization depending on the maintenance of a quality water source and efficient sanitation services. The relative abundance of water in the region of Montréal and the technology available has been sufficient to satisfy the city's inhabitants up to the present day. Nonetheless, the infrastructure is aging (one third is over 50 years of age) and problems concerning the ecological impact of this water system require fundamental changes in the management of this resource. This section is a brief look at water as a resource in the Montréal context.

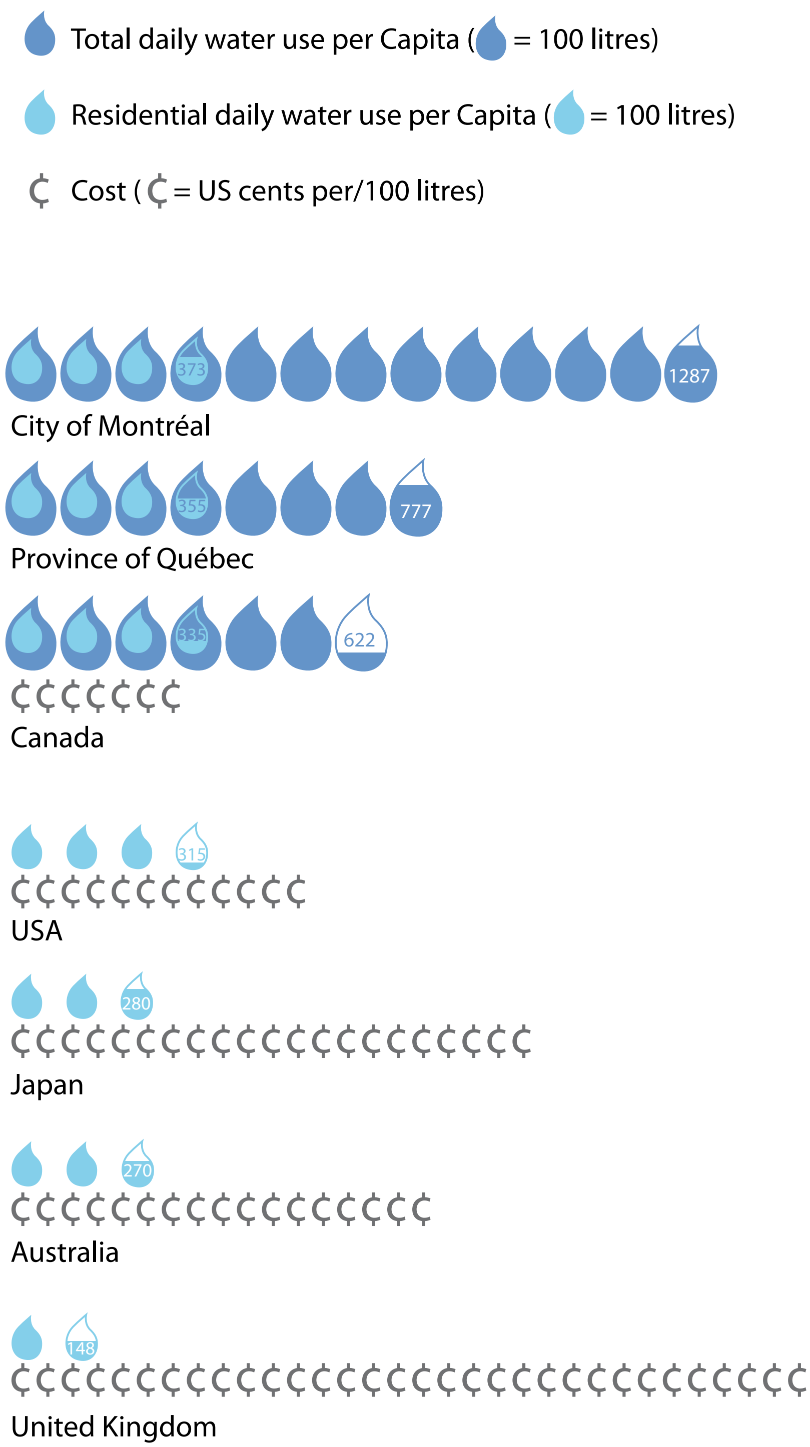
Fluvial System

The City of Montréal is part of an archipelago whose principal islands are: the island of Montréal, Jesus Island, Bizard Island, Nuns Island, Dorval Island, Notre-Dame Island and Sainte-Hélène Island. Multiple waterways interlace the area. The St-Lawrence river flows through Lac Saint-Louis encloses the southern side of the island of Montréal and continues its course eastward. The Lac des Deux Montagnes separates into the Des Prairies river and Milles îles river. The former encloses the northern part of the Montréal island and later passes north of Jesus Island (or Laval). Together these water bodies create a water basin superior to 100 000 km^2.

Supply Infrastructure

The region of Montréal's drinking water depends on seven entry stations on the island: Sainte-Anne-de Bellevue, Pierrefonds, Pointe-Claire, Dorval, Charles-J-Des Baillets and Atwater. All of these stations are located on the western side of the island or upstream. Together they can produce a total of 2942 000 m^3 per day. The stations are connected to 681 km of primary water mains, 4557 km of secondary water mains, 29 200 fire hydrants and an 8 km long aqueduct canal.

The age of Montréal's system is a serious cause for concern. The rate of leakage has reached 47% according to the City of Montréal, inflating costs of water treatment and purification, as well as attenuating the efforts to diminish public water usage . Furthermore, unlike many European systems Montréal's is not setup to provide any grey water for alternate use (grey water systems are the responsibility of individuals, not the municipality). These two factors may account for Montréal's abnormally high daily water usage per capita.



Sources: Brandes, Oliver M.; Environment Canada

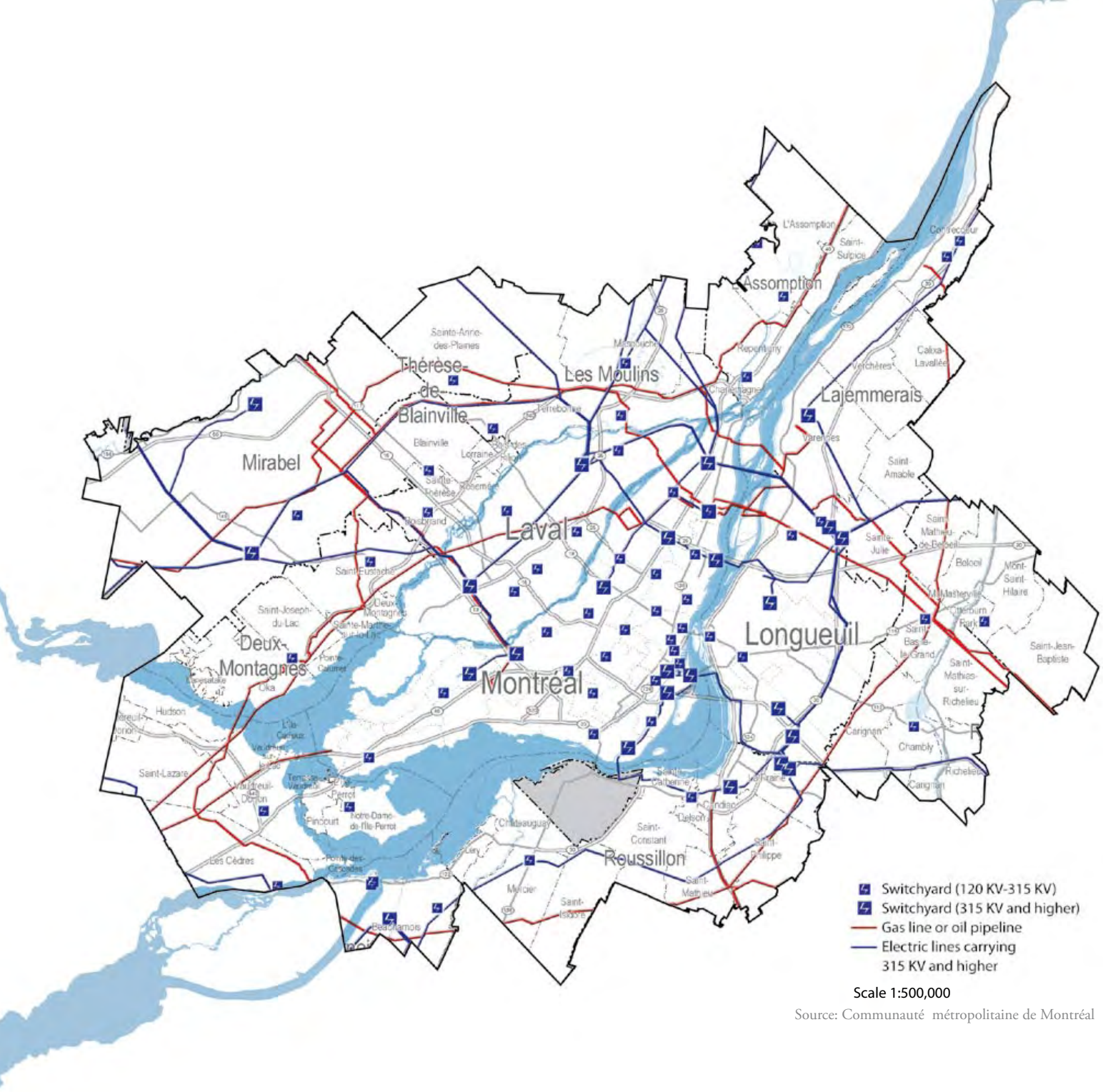
Treatment Infrastructure

Since 1996 almost all of the wastewater of the Island of Montréal is treated at Rivière-des-Prairies. A small percentage of wastewater is treated independently (e.g. petrochemical plants on the east side of the island). This mega-plant built in 1970 provides primary treatment through a physico-chemical treatment process. Once treated the water is returned to the St-Lawrence River without further disinfection . Monitoring of the water quality on the eastern end of the island is very poor due to the Rivière-des-Prairies plant output. One impact is higher costs for treating potable water downstream. The water treatment relies on a NIMBY philosophy.

Future

Historically, the city has underestimated the global cost of water services. It has now adopted a "pay for use" philosophy and created a new property tax to cover water services. The City hopes the system will be self-financing by 2013. Nevertheless it must first deal with serious technical problems and the age of the system .

Sources: City of Montréal; Fleury, Marc-Antoine



Source: Communauté métropolitaine de Montréal

Energy

Hydroelectricity and oil are the two forms of energy most consumed in Québec. The relatively high production of hydroelectric power in Québec has a positive impact on the amount of greenhouse gases produced, making it the province with the lowest per capita emissions in the country. Certainly, with global warming being a major concern, this makes hydroelectric power significantly more attractive than fossil fuel sources. However, hydroelectric power generation is not without problems. Flooding can be devastating to local ecosystems and wildlife and water discharge can have serious effects on fish and drinking water downstream.

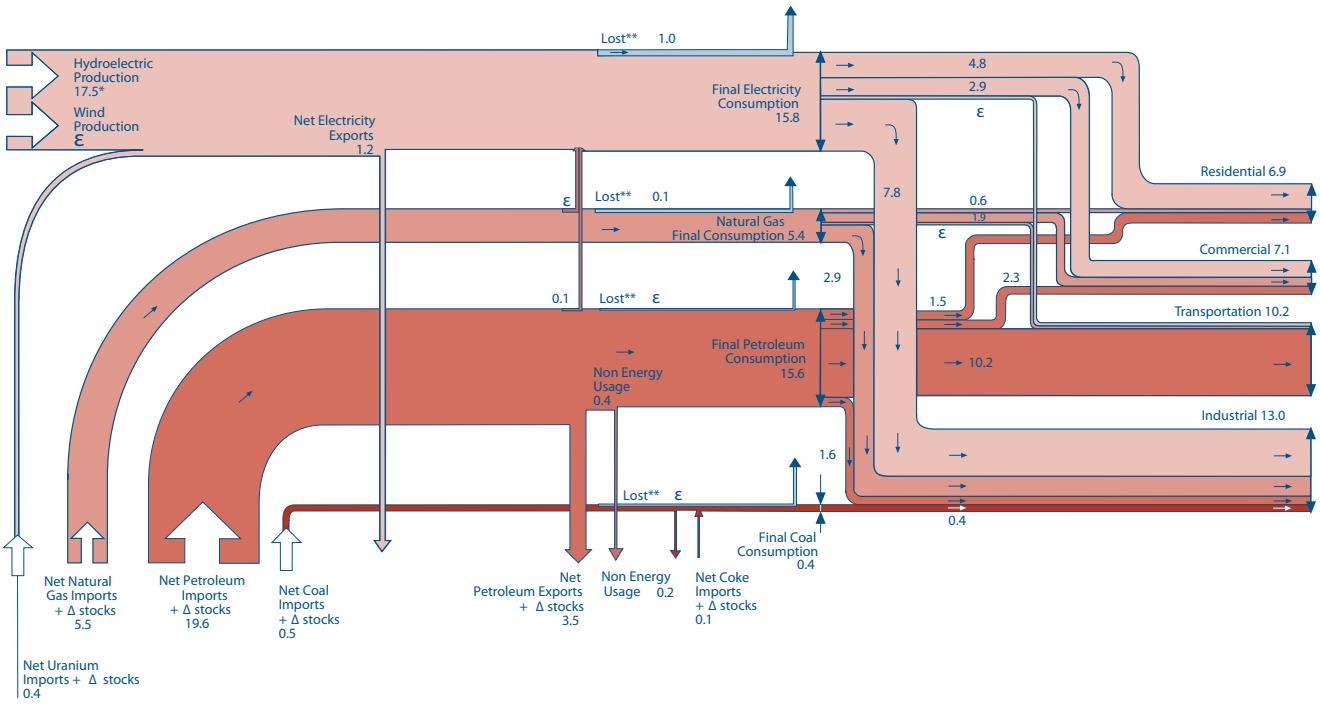
The chart below shows the per capita energy consumption and per capita carbon dioxide emissions for different regions of the world. Also included are the two highest and lowest energy consumers and carbon dioxide producers, the countries of North America, and the province of Québec. The island of Montréal accounts for 47% of Québec's population. Thus, as a rough estimate, it is responsible for nearly half of Québec's energy usage and related carbon dioxide emissions.

Region/Nation	**Energy Usage per capita (kg of oil equivalent)**	**CO2 Emissions per capita (tonnes)**
Asia	890.1	2.1
Bangladesh	144.9	0.2
Nepal	349.8	0.1
Myanmar	252.2	0.1
Central America & Caribbean	1 265.4	2.9
Europe	3 621.3	8.3
Iceland	11 800	7.4
Middle East & North Africa	1 487.1	3.7
Yemen	190.9	0.5
Qatar	26 888.3	55.6
United Arab Emirates	11 331.7	26.5
North America	7 928.5	19.4
Canada	7 999.5	16.5
Québec	**5 761.7**	**8.17**
USA	7 920.9	19.8
Mexico	1 515.8	3.7
South America	1 088.8	2.1

Sources: World Resources Institute; Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune.

Primary Energy	Secondary Energy	Final Consumption

In 10^6 Tonees of Oil Equivalent



* Includes production from Churchill Falls.
** Energy lost in the production transformation and treansportation.
Note : Biomass is not included in this diagram.

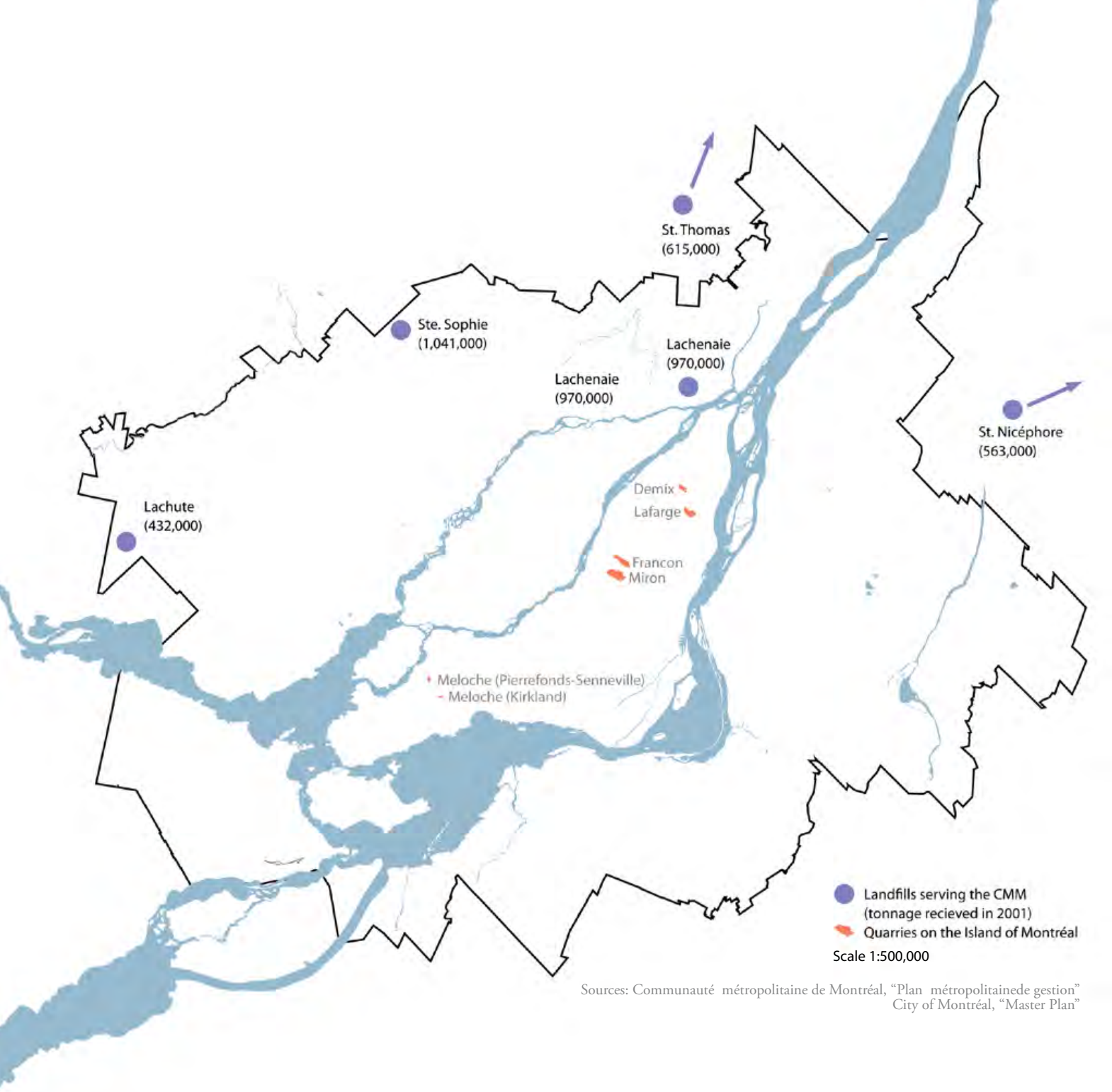
Source: Gouvernement du Québec. Ministère des Ressources naturelles et de la Faune.

ENERGY SOURCE	Tonnes of Oil Equivalent	% of Total
Hydroelectric	17 500 000	40.2
Wind	negligible	---
Nuclear	400 000	0.9
Natural Gas	5 500 000	12.6
Oil	19 600 000	45.1
Coal	500 000	1.2
TOTAL	43 500 000	100

Oil is predominantly used for transportation and home heating in Québec. Due to its reliance on oil, transportation is the sector responsible for the ½ of greenhouse gas emissions in the province, but consumes only ¼ of the energy produced. The residential sector, which uses predominantly hydroelectric power, exhibits the opposite phenomenon; it consumes 1/5 of the energy produced but produces only 1/10 of the carbon dioxide emissions. Industry consumes the most energy, but ranks second highest in carbon dioxide emissions.

SECTOR	ENERGY CONSUMPTION (2004)		CARBON DIOXIDE EMISSIONS (2002)	
	Tonnes of Oil Equivalent	% of Total	Tonnes	% of Total Production
Residential	6 900 000	19.65	5 753 000	9.52
Commercial	7 100 000	17.01	10 496 000	17.37
Transportation	10 200 000	24.60	29 540 000	48.88
Road		(78.56)		
Rail		(2.23)		
Sea		(6.52)		
Air		(12.69)		
Industrial	13 000 000	38.74	14 273 000	23.62
Mining		(3.72)		
Chemical Production		(3.68)		
Cement		(1.42)		
Steel		(30.71)		
Pulp and Paper		(34.22)		
Other		(26.26)		
Electricity Production	---	---	377 000	0.62
TOTAL (inc. losses)	42 900 000	100	60 440 000	100

Source: Gouvernement du Québec. Ministère des Ressources naturelles et de la Faune.



Sources: Communauté métropolitaine de Montréal, "Plan métropolitainede gestion"
City of Montréal, "Master Plan"

On average, residents on the Island of Montréal produce 400 kilograms of garbage per year, slightly less than the regional average of 429 kilograms. Metropolitan garbage goes to one of five landfills located around the region. Of the 6 quarries on the Island of Montréal, four of them are receiving waste, snow that has been removed from city roads, or ashes from the incinerated sludge coming from wastewater treatment.

Along with a regional water treatment plan, the CMM is also implementing a region-wide waste management plan. This plan aspires to increase the percentage of waste that is reclaimed or otherwise recycled to 60% by 2013.

Waste

Thousands of tonnes of waste produced per year per sector

Source: Communauté métropolitaine de Montréal, "Plan métropolitain de gestion des matières résiduelles"

In 2003, only 29.3% of the waste produced--in what are the boroughs of the current city of Montréal--was diverted from landfills. 733 280 tonnes were buried, and 404 523 were recovered or recycled. This rate was down slightly from the previous year. In 2003 residents actually recycled a higher quantity of residual material than in 2002, but rate of non-diverted residual material grew at a greater proportion. A new report estimates waste diversion rate in Montréal to be 34%.

The respective levels of government in Québec and Montréal are all involved in the city's waste management. At the provincial and regional levels, this involvement is policy oriented. In September 2000, the province published its waste management plan (Québec Residual Materials Management Policy), which set the goal for municipalities to divert 60% of their waste by 2008. In 2004, the CMM adopted their own plan (Plan métropolitain de gestion des matières résiduelles), which set a goal of reaching the provincial target by 2013--five years after the provincial deadline.

An interesting difference between the two plans is that whereas the provincial plan outlines reclamation goals both by material type and sector producing, the CMM plan speaks only of reclamation by material type. This is a shortcoming of the plan as each sector may have different ability to divert waste. For example, the provincial plan proposes that industries, businesses and institutions achieve a 95% recycling rate for glass. There is no mention of this in the CMM plan. The primary weakness of the CMM plan is that it does not set quantifiable goals about overall waste reduction. It is mentioned, but the only number given is a percentage of material to be reclaimed. This illustrates a common and serious misunderstanding of the 3R policy: REDUCE, Reuse, recycle...in that order.

The city is responsible for tracking the overall waste management of the city and setting minimum standards for boroughs to achieve. The boroughs are each responsible for managing the collection and transportation of waste and for tracking their own waste management. Since the quality of reporting varies from borough to borough, the ability of the city to accurately portray its actual waste management is inhibited. Due to this tracking problem, the city is not able to take full advantage of a Bill 102 (passed in 2002), which entitles municipalities to 50% compensation of the net costs of collection of residential recyclables. (This compensation comes from companies whose products and packaging are sold in Québec.)

The General Auditor for Montréal estimates the average cost of recovery of secondary waste to be $230/tonne. However, in some boroughs this number is as low as $100/tonne. The city spent $29.5 million on material recovery in 2002. Of this, $22.8 million went to collection and transportation, while only $6.7 million went to processing.

Sources: City General Auditor; Communauté métropolitainede Montréal, "Plan métropolitainede gestion"; Government of Québec, Ministry of Sustainable Development, Environment, and Parks.

Conclusion

The themes covered in this second part depict a series of intertwined systems forming what we call, in administrative terms, the City of Montréal and its metropolitan area. For the most part these systems are artificial, as described in the sections on transport, energy and waste. In contrast to these artificial systems, there are biological systems which are deemed to be sustainable because they function while maintaining a built-in equilibrium. Disturbing the equilibrium of biological systems with artificial systems causes certain biological systems to activate compensation mechanisms in some cases, and in other cases it may cause the system to collapse. In describing "what" the City of Montréal is, the interdependence of the themes and underlying systems became self-evident. Given this interdependence, it is evident that a segregated systems analysis gives only one part of the picture. The next part of the document uses three more in-depth, cross-category investigations to illuminate other aspects of sustainability in the city.

Part Two: Works Cited

City General Auditor. "Report of the City General Auditor to the Conseil Municpal: For the year ended December 31, 2005." 2006. http://www.ville.montreal.qc.ca/verificateur. [Accessed June 16, 2006.]

----- *Cahier d'information complémentaire de 2005*. http://ville.montreal.qc.ca/pls/portal/docs/page/service_fin_fr/media/documents/cic-2005.pdf. [Accessed September 16, 2006.]

----- "Chapitre 4: Conditions de deplacement. " *Plan de Transport: Portrait et diagnostic*. June 1, 2005. www.ville.montreal.qc.ca. [Accessed August 13, 2006.]

----- "Master Plan: Part 1: Chapter 2: 2.7: Objective 19: Action 19.1." November 2004. http://www.ville.montreal.qc.ca. [Accessed June 2006.]

----- *Le goût de l'eau clair: La production et la distribution de l'eau potable à Montréal*. (Pamphlet. No publication information available.)

City of Montréal, Public Works. "Réseau routier: Des kilometres et des kilometres de chaussees." http://www2.ville.montreal.qc.ca/rue/chaussees/fr/planif_network.shtm. [Accessed August 13, 2006.]

Communauté métropolitaine de Montréal. "Part 3. La région métropolitaine de Montréal: situation et performance." *Vision 2025: Cap sur le mond: bâtir une communauté compétitive, attractive, solidaire et responsable. Tome 1: Diagnostic et défis.* p. 58. http://www.cmm.qc.ca/vision2025/vision2025_docdeclencheur_3.pdf [Accessed Sept. 16, 2006.]

----- "Part 4. La région métropolitaine : évolutions." *Vision 2025. Cap sur le monde : bâtir une communauté compétitive, attractive, solidaire et responsable. Tome 1 : Diagnostic et défis*. December 2002. p. 144, 152. http://www.cmm.qc.ca/vision2025/vision2025_docdeclencheur_4.pdf [Accessed Sept. 16, 2006]

----- "Plan métropolitainede gestion des matieres residuelles." April 2006. http://www.cmm.qc.ca/publications/documentscmm/index.php. [Accessed June 19, 2006.]

Fleury, Marc-Antoine. "Unearthing Montreal's Municipal Water System Amalgamating and Harmonizing Urban Water Services." Graduate Paper Series. York University: Faculty of Environmental Science. June 2003. p. 28. http://www.yorku.ca/fes/research_pub/pubs/pdf/ma_fl eury.pdf [Accessed July 4, 2006]

Government of Québec. Ministry of Sustainable Development, Environment and Parks. "Québec Residual Materials Management Policy, 1998-2008." 2002. http://www.mddep.gouv.qc.ca/matieres/mat_res-en/parts-1-4.htm#4. [Accessed September 23, 2006.]

Guenther, Paul et al. "MUCS Need and Demand Analysis : Montréal" *Montréal Urban Community Sustainment*. June 2005. p.15, 28, 30. http://www.mucs.ca/library/MUCS%20-%20Montréal%20Need%20and%20Demand%20Analysis.pdf [Accessed July 17, 2006]

Tomalty, Ray and Don Alexander. "Chapter 7 The Montréal Region." *Smart Growth in Canada: Implementation of a planning Concept.* Ottawa: Canada Mortgage and Housing Corporation, 2005. http://www.smartgrowth.ca/research/SmartGrowth.pdf [Accessed Sept. 16, 2006]

Part Two: Map and Image Sources

All GIS generated maps:

Please note: In addition to sources listed below, data for all GIS generated maps has been adapted from:
CanMap Streetfiles v2005.3 (Canmap Dissemination Areas) [Computer file] 2005. Markham, ON: DMTI Spatial, Inc. Available : McGill University Library Controlled Access. http://www.edrs.mcgill.ca/GIS/data/dmti/CensusBoun/arcview/2001census/da/can/CANda.zip [Accessed July 4, 2006.]

Part Two: What is Montréal?

Aerial Photo adapted from:

Landsat 7 Orthorectified Imagery over Canada. [computer file] 2000. Ottawa, Ontario: Natural Resources Canada. Available FTP: http://geogratis.cgdi.gc.ca/download/landsat_7/ortho/geotiff/utm/ [Accessed June 6, 2006.]

Demographics

Population Density Map adapted from:

CanMap Streetfiles v2005.3 (Canmap Dissemination Areas) [Computer file] 2005. Markham, ON: DMTI Spatial, Inc. Available : McGill University Library Controlled Access. http://www.edrs.mcgill.ca/GIS/data/dmti/CensusBoun/arcview/2001census/da/can/CANda.zip [Accessed July 4, 2006.]

CanMap Streetfiles v2005.3 (CanMap Water) [Computer file] 2005. Markham, ON: DMTI Spatial, Inc. Available : McGill University Library Controlled Access. http://www.edrs.mcgill.ca/GIS/data/dmti/CensusBoun/arcview/2001census/water/CANwat.zip [Accessed July 4, 2006.]

Statistics Canada, (2001 Canadian Census Tables) [Computer file]. 2002. Available: University of McGill Library Controlled Access. http://dc1.chass.utoronto.ca/census/2001_da_all.html [Accessed July 4, 2006.]

Population Density Statistics:

Communauté métropolitaine de Montréal. "Part 3. La région métropolitaine de Montréal: situation et performance." *Vision 2025: Cap sur le monde : bâtir une communauté compétitive, attractive, solidaire et responsable. Tome 1 : Diagnostic et défis*. December 2002. p. 69 http://www.cmm.qc.ca/vision2025/vision2025_docdeclencheur_3.pdf [Accessed Sept 16, 2006.]

Language Distribution Map adapted from:

Statistics Canada, (2001 Canadian Census Tables) [Computer file] 2002. Available: University of McGill Library Controlled Access. http://dc1.chass.utoronto.ca/census/2001_da_all.html [Accessed July 4, 2006.]

----- (Cartographic boundary Files for 2001) [Computer file] 2002. Available: University of Waterloo Map and Design Library Controlled Access. http://tdr.uoguelph.ca/DATA/CENSUS/2001/GIS01/GEOGFILES/arcinfo/cbfv2_flcv2/national/da-ad/gda_000b02a_e.exe [Accessed July 4, 2006.]

Immigration Map adapted from:

Statistics Canada, (2001 Canadian Census Tables) [Computer file] 2002. Available: University of McGill Library Controlled Access. http://dc1.chass.utoronto.ca/census/2001_da_all.html [Accessed July 4, 2006.]

----- (Cartographic boundary Files for 2001) [Computer file] 2002. Available: University of Waterloo Map and Design Library Controlled Access.http://tdr.uoguelph.ca/DATA/CENSUS/2001/GIS01/GEOGFILES/arcinfo/cbfv2_flcv2/national/da-ad/gda_000b02a_e.exe [Accessed July 4, 2006.]

Income Map adapted from:

Statistics Canada, (2001 Canadian Census Tables) [Computer file] 2002. Available: University of McGill Library Controlled Access. http://dc1.chass.utoronto.ca/census/2001_da_all.html [Accessed July 4, 2006.]

----- (Cartographic boundary Files for 2001) [Computer file] 2002. Available: University of Waterloo Map and Design Library Controlled Access. http://tdr.uoguelph.ca/DATA/CENSUS/2001/GIS01/GEOGFILES/arcinfo/cbfv2_flcv2/national/da-ad/gda_000b02a_e.exe [Accessed July 4, 2006.]

Housing Type Map adapted from:

Statistics Canada, (2001 Canadian Census Tables) [Computer file] 2002. Available: University of McGill Library Controlled Access. http://dc1.chass.utoronto.ca/census/2001_da_all.html [Accessed July 4, 2006.]

----- (Cartographic boundary Files for 2001) [Computer file] 2002. Available: University of Waterloo Map and Design Library Controlled Access. http://tdr.uoguelph.ca/DATA/CENSUS/2001/GIS01/GEOGFILES/arcinfo/cbfv2_flcv2/national/da-ad/gda_000b02a_e.exe. [Accessed July 4, 2006.]

Transportation

Transportation Map adapted from:

City of Montréal. "Chapitre 4: Conditions de deplacement" *Plan de Transport: Portrait et diagnostic.* p. 25, 52. June 1, 2005. www.ville.montreal.qc.ca. [Accessed August 13, 2006.]

Gouvernement du Québec Ministère des Transports. "Map 1 Initiatives Pertaining to Mass Transit." *Transportation Management Plan: Greater Montréal Area.* April 2000. http://www.mtq.gouv.qc.ca/en/regions/Montréal/plan/index.asp. [Accessed July 31, 2006.]

Land Use

Land Use Map adapted from:

City of Montréal. "Map 2.5.1 Parks and Green Spaces." *Master Plan*. Montréal, 2004. http://ville.montreal.qc.ca/portal/page?_pageid=2762,3099643&_dad=portal&_schema=PORTAL [Accessed Sept. 16, 2006.]

--- "Map 3.1.1 Land Use Designation."

Communauté métropolitaine de Montréal. "Grandes Affectations du Sol (2001)." *Plan métropolitain de gestion des matières résiduelles.* June 20, 2002. http://cmm.qc.ca/pmgmr/documents/documents/rapportchamard/annexe8_carte02_A0.pdf. [Accessed August 29, 2006.]

Land Use Diagram:

Communauté métropolitaine de Montréal. "Part 4. La région métropolitaine : évolutions." *Vision 2025. Cap sur le monde : bâtir une communauté compétitive, attractive, solidaire et responsable. Tome 1 : Diagnostic et défis*. December 2002. (p. 161, 166, 203, 204) http://www.cmm.qc.ca/vision2025/vision2025_docdeclencheur_4.pdf. [Accessed Sept 16, 2006.]

Food

Food Maps adapted from:

Communauté métropolitaine de Montréal. "Grandes Affectations du Sol (2001)." *Plan métropolitain de gestion des matières résiduelles.* June 20, 2002. http://cmm.qc.ca/pmgmr/documents/documents/rapportchamard/annexe8_carte02_A0.pdf. [Accessed August 29, 2006]

----- "Grappe Bioalimentaire" *Les Grappes Métropolitaines.* February 23, 2005. http://www.cmm.qc.ca/grappes métropolitaines/file/tab/bioalimentaire_tab.pdf. [Accessed Sept. 16, 2006.]

Gotlieb, Robert. *Environmentalism Unbound: Exploring New Pathways for Change*. Cambridge: MIT Press, 2001.

Statistics Canada. *2001 Census of Agriculture*. http:www.statcan.ca/english/freepub/95F0355XIE/tables/html/optab01.htm [Accessed August 18, 2006]

Water

Water Map adapted from:

City of Montréal, City Planning Department. *Urbanisation, a study of urban expansion in the Montréal region*. 2nd ed. Montréal: Service d'urbanisme de la ville de Montréal, 1968.

City of Montréal. "Map of Water Treatment Infrastructure." http://www2.ville.montreal.qc.ca/pls/portal/docs/page/eau_potable_fr/media/documents/carte_usines.pdf. [Accessed August 29, 2006.]

Environnement Québec. "La qualité des eaux autour de L'île de Montréal, 1973 – 2000: Porte ouverte aux usages." http://www2.ville.montreal.qc.ca/pls/portal/docs/page/eau_potable_fr/media/documents/carte_usines.pdf. [Accessed August 29, 2006.]

Water Usage diagram:

Brandes, Oliver M. and Keith Ferguson. "Flushing the Future? Examining Urban Water Use in Canada." Circa 2003. http://www.polisproject.org/polis2/PDFs/FlushingFuture.pdf. [Accessed Sept. 16, 2006.]

Environment Canada. "Municipal water use 2001 Statistics." *2004 Municipal Water Use Report*. February 2005. www.ec.gc.ca/water/en/info/pubs/sss/e_mun2001.pdf. [Accessed Sept. 16, 2006.]

Energy

Energy Map adapted from:

Communauté métropolitaine de Montréal. “Documents: projet de schema métropolitain d’aménagement et de développement: Plan 28: Transport d’energie.” http://www.cmm.qc.ca/psmad/. [Accessed August 29, 2006.]

International CO2 Emissions and Energy Consumption Chart data from:

World Resources Institute. “CO2 : Emissions per capita (source: IEA)” *Earth Trends: Climate and Atmosphere*. (Searchable Database.) 2006. http://earthtrends.wri.org/searchable_db/index.php?theme=3 [Accessed July 16, 2006.]
----- “Energy Consumption : Consumption per capita.” *Earth Trends: Energy and Resources*. (Searchable Database.) 2006. http://earthtrends.wri.org/searchable_db/index.php?theme=6 [Accessed July 16, 2006.]

Gouvernement du Québec. Ministère des Ressources naturelles et de la Faune. “L’Energie au Québec: Edition 2004.” p 127. http://www.mrnf.gouv.qc.ca/publications/energie/energie/energie-au-Québec-2004.pdf. [Accessed June 29, 2006.]

Energy diagram translated from:

Gouvernement du Québec. Ministère des Ressources naturelles et de la Faune. “L’Energie au Québec: Edition 2004.” p 127. http://www.mrnf.gouv.qc.ca/publications/energie/energie/energie-au-Québec-2004.pdf. [Accessed June 29, 2006.]

Energy Charts adapted from:

Gouvernement du Québec. Ministère des Ressources naturelles et de la Faune. “L’Energie au Québec: Edition 2004.” Accessed June 29, 2006. http://www.mrnf.gouv.qc.ca/publications/energie/energie/energie-au-Québec-2004.pdf.

Waste

Waste Map adapted from:

City of Montréal. “Master Plan: Part 1: Chapter 2: 2.7: Objective 19: Action 19.1.” November 2004. http://www.ville.montreal.qc.ca. [Accessed June 2006.]

Communauté métropolitaine de Montréal. “Plan métropolitain de gestion des matières résiduelles.” p 30. April 2006. http://www.cmm.qc.ca/publications/documentscmm/index.php. [Accessed June 19, 2006.]

Waste Per Sector Diagram

Communauté métropolitaine de Montréal. “Plan métropolitain de gestion des matières résiduelles.” April 2006. p 15, 25, 26. http://www.cmm.qc.ca/publications/documentscmm/index.php. [Accessed June 19, 2006.]

Part Three: Singular Perspectives

Landscapes of Potential

--Edward J. Martin

As the region of Montréal continues to increase its population and expand its urban area, questions are being raised about the processes of this transformation. This chapter looks at how and where the city is growing, and questions how various types of urbanization relate to sustainable development. Samples from the contemporary discourse on urban expansion versus urban consolidation are paired with a series of photographs depicting Montréal's landscapes of potential.

Location of Photographs

Connect / Disconnect: a sectional investigation of the infrastructures along a transportation corridor

--Nancy-Ann Wilson

How the city is inhabited and moved through is often ignored in discussions of urban issues and strategies. It is precisely this experience, however, that is crucial if Montréal is to achieve its goal of increasing pedestrian activity and reducing the percentage of motorized trips within the city. This chapter utilizes photographic studies and sectional drawings as a means of investigating transportation infrastructures collected along a transportation corridor marked by the Ville-Marie expressway.

Location of Sections

From Tenements to Vegetables

Des Seigneurs Community Garden History: Creation of a Space for a Sustainable Practice

--Catherine S. Vandermeulen

This chapter chronicles the appearance of a vegetable garden in Little Burgundy during the 1970s. In this essay, the discourse on sustainable development is taken as belonging to what Henri Lefevbre refers to as an "abstract space." The intention is not to further critique the discourse of sustainable development, nor to improve its definition. The idea is rather to create a clearer picture of a spatial practice that has so far been successful in the City of Montreal and that links conceived, perceived and lived spaces into one daily practice.

Des Seigneurs Community Garden

Landscapes of Potential

--Edward J. Martin

As populations continue to be drawn from rural to urban environments, the nature of urban development will have an increasingly important role in the general mode of how our civilizations operate on the planet. The increasing size and population of most North American cities is of critical concern as their expanding influence is propelled by the shift towards larger regional economies within a global marketplace. This research looks at how the urban region of Montréal is growing in order to raise questions about current methods and their relationship to practices of sustainable development. If we aspire to structure the next phases of development around sustainable aspirations, what are the changes that will be required to the current models, processes and types of growth.

In the past century, Montréal has undergone a significant transformation. The expansion and growth of the city raises a number of issues and concerns about the scope of its identity, and the nature of its regional form. One basic assumption in this research is that central cities and their suburban extensions function in a complex set of interdependent relationships and cannot be considered exclusive from one another. A second assumption is that the urban form and structure of communities has direct consequences on their social, economic and environmental conditions.

This chapter begins by framing the basic concept of growth in our society and how it is generally controlling the dynamics of our urbanism. The second piece looks at how Montréal has been growing and how the city and metropolitan governments are aspiring to sustain certain trends. The final component of this chapter compares two basic directions for accommodating this growth: urban expansion versus urban consolidation. Using literary samples organized around the three spheres of sustainable development, this analysis is presented along side a series of photographs taken in the core and on the edges of Montréal.

1763 population: 5,200

1867 population: 100,000

1907 population: 270,000

1931 population: 1,023,000

1951 population: 1,539,000

1961 population: 2,216,000

1971 population: 2,743,000

1981 population: 2,828,000

2001 population: 3,507,424

growth

noun
- the process of increasing in physical size
- the process of developing or maturing physically, mentally, or spiritually
- the increase in number and spread of small or microscopic organisms
- the process of increasing in amount, value, or importance
- increase in economic value or activity

"A sustainable society would be interested in qualitative development, not physical expansion. It would use material growth as a considered tool, not a perpetual mandate. Neither for nor against growth, it would begin to discriminate among kinds of growth and purposes for growth. It could even entertain rationally the idea of purposeful negative growth, to undo excess, to get below limits, to cease doing things that, in a full accounting of natural and social costs, actually cost more than they are worth."

- Meadows, Donnella; Randers, Jorgen; Meadows, Dennis (p. 255)

"The growth society is dominated and often obsessed by growth economics. It makes growth for growth's sake the essential aim of life, if not its only aim. This is unsustainable because it pushes the limits of the biosphere."

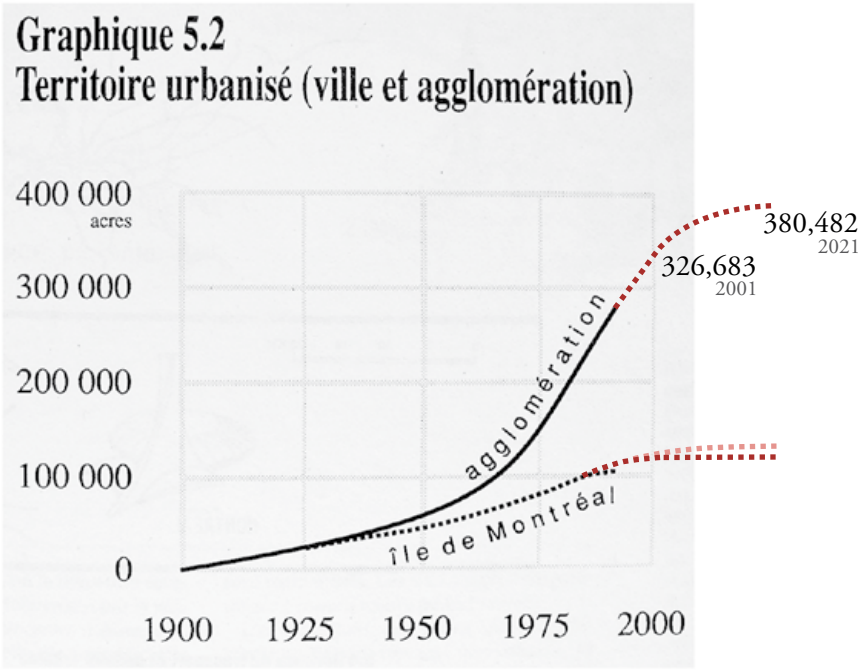
- Latouche, Serge (p. 1)

As its definition suggests, growth can be used to describe a number of different processes. The act of urbanization embodies a combination of these processes, be it in the form of a growing land area, population, economic value, or in the maturing collective consciousness or cultural capital within a city. These processes are almost always linked in some manner, but do not necessarily depend upon one another. For instance, it is possible to imagine a scenario in which the land area of a city grows while the population does not, or that the economic value of a neighbourhood can change without any expansion in it's area or density.

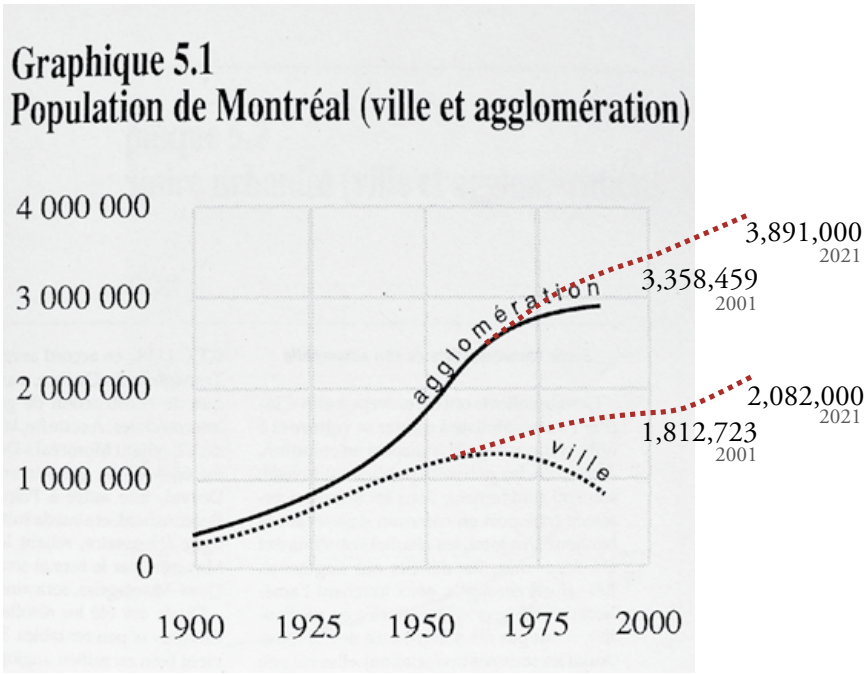
The growth of Canada's population is becoming increasingly dependent on international immigration. Since 1972, fertility rates in Canada have been below the level required to maintain natural population levels. This reality, combined with the aging baby boom demographic, is influencing international immigration policy, as Canada certainly expects to grow. The goal of prosperity obtained through growing economy is common in most contemporary planning rhetoric, often advocating growth as a requirement for improving the general quality of life. This common usage of the term tends to imply a linear pattern of increasing something tangible, a pattern that is by definition contrary to the basic idea of sustainable.

In today's competitive global marketplace, this emphasis on growth and accumulation has become entrenched in our lifestyles. It is generally accepted that growth is a necessary and positive element in our economy and population. It's presence is unquestioned. In the 2004 edition of 'The Limits to Growth', Donnella Meadows, Jorgen Randers and Dennis Meadows write that this phenomenon creates a sense of containment that is effectively trapping our society. "Dominated by images of heedless growth or frustrating stagnation, the shared human consciousness can hardly envision a purposeful, sufficient, just, and sustainable society."

Meadows, Randers and Meadows go on to discuss alternative applications of growth, and how it might be used more carefully or sparingly. Some of their ideas find parallels with the writings of Serge Latouche, who proposes a 'decroissance' or 'de-growth', advocating that "we need to aim to create a society that is based on quality not quantity, on cooperation and not competition."



Larouche, Pierre (p.91)



Larouche, Pierre (p.89)

"...The ultimate goal is to catch up to the top five North American cities in terms of GDP per capita: Boston, San Francisco, Denver, New York and Washington... According to the Conference Board of Canada, Montréal's economy has the potential to grow an average of 2.8% per year between 2002 and 2020. If we are to join the ranks of these competing cities, we must exceed our projected growth rate by 2% each year between now and 2025."

- CMM, Charting our International Future Summary Text (p. 9)

"Our goal is clear: Montréal must become one of the most competitive metropolitan areas in North America."

- CMM, Charting our International Future (p.5)

"It is estimated that the region's population will grow to about 3.8 million inhabitants by the year 2021. This assumes a diminishing growth rate, from about 1% in the 1981-2001 period to about .9% in the 2001-2021 period. Furthermore, the demographic weight of the City of Montréal will continue to decline, with the province projecting that only 36% of new growth in the region will occur on the Island of Montréal."

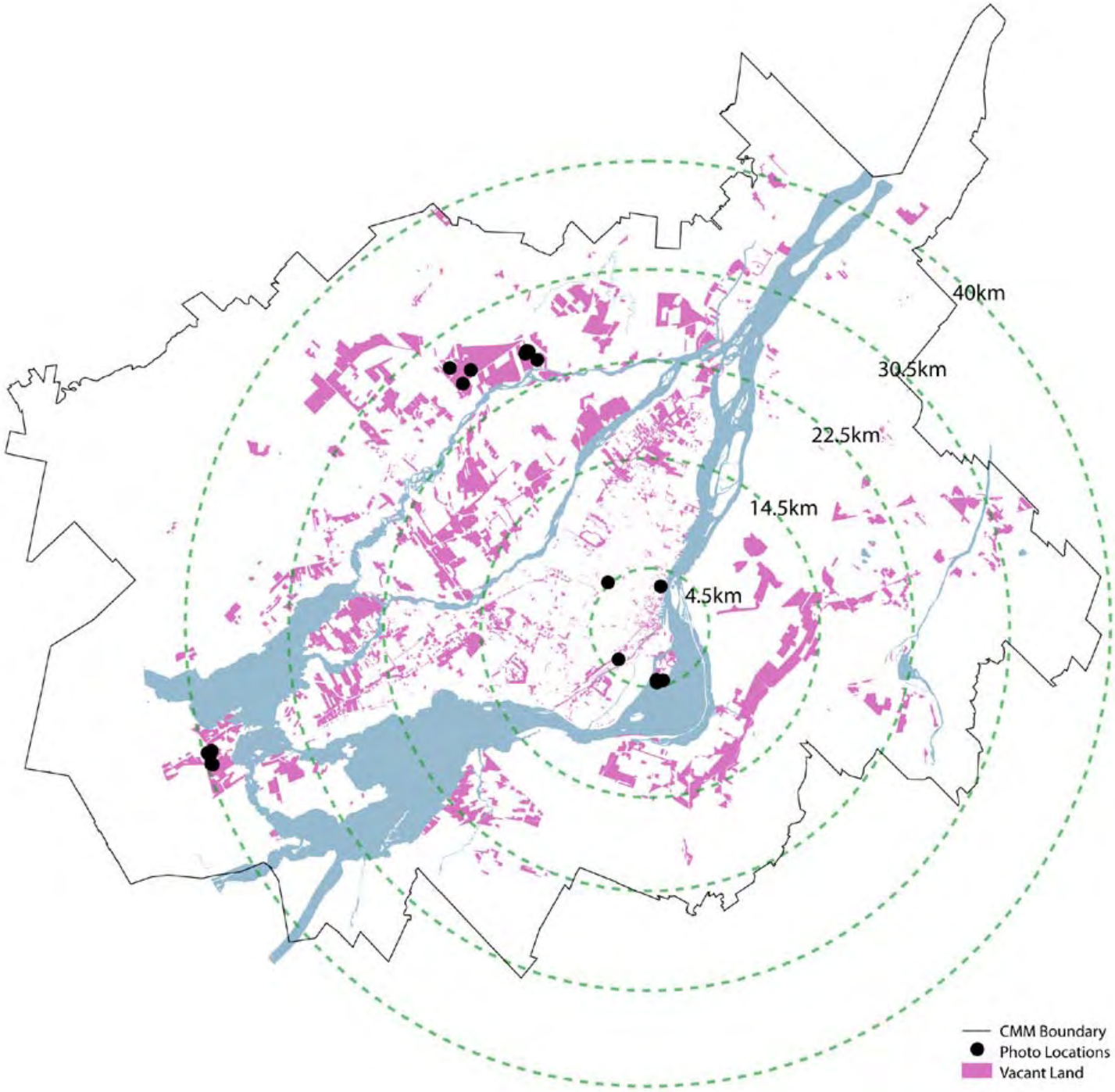
- Tomalty, Ray; Alexander, Don. (p. 178)

Over the last century, Montréal's urban area has outgrown the island on which the city began. The name, Montréal, now refers to a much larger entity, including areas on both the northern and southern shorelines as well as the island of Laval. This transformation happened relatively recently as a result of the major economic and population expansion during the 20th century, and has for the most part been intentional, with both provincial and municipal planning authorities aspiring to increase the scale of Québec's largest city.

Riding the confidence of a strong economy during the 1960's, Montréal's population was projected to grow almost exponentially towards the year 2000. While the region has experienced a great expansion, the population figures today fall short of these earlier expectations. The tone of the ambitious projections made in the 60's resonates in the contemporary discourse on the regional economy. In its economic development plan titled *Charting Our International Future: A Competitive Metropolitan Montréal Region*, the Communauté Métropolitaine de Montréal declares its primary goal of growing its economy to a level where it can compete with other world class cities.

As the portrait of Montréal revealed, there are substantial discrepancies between the island of Montréal and the rest of the urban region. This issue will continue to be prominent, as the goals of these different jurisdictions are understandably very different from one another. For the purposes of this research, one particular aspect of this discrepancy - the issue of population density as it relates to urban development - will be central.

Measured over it's metropolitan area, Montréal is one of the most densely populated cities in North America. This is largely due to the widespread medium density urban fabric on much of the island of Montréal. However, this condition is changing as a result of current growth patterns, which are increasing the land area of the city faster than the population due to their lower than average population densities.



Source: Communauté Métropolitaine de Montréal.

Vacant

adjective
- (of premises) having no fixtures, furniture, or inhabitants; empty.
- (of a position or office) not filled : the president resigned and the post was left vacant.
- (of a person or their expression) having or showing no intelligence or interest : a vacant stare.

Synonyms:
- empty, unoccupied, available, not in use, free, unfilled; uninhabited, untenanted

"It is estimated that the number of households in the Montréal CMA will increase by 150,000 during the 2004-2014 period. The City sets an ambitious but realistic objective of supporting the construction of 60,000 to 75,000 new housing units, which would accommodate 40% to 50% of these 150,000 new households. Between 1984 and 2003, Montréal's share of the region's total new housing construction varied between 22% and 34%."

- Ville de Montréal. Master Plan (p. 25)

In 1978, with the provincial agricultural commission, the government of Québec established boundaries to protect farmland across the province. Within the region of Montréal, there are substantial areas which have either been set aside from this reserve to accommodate future urban development or other non-agricultural uses. These areas are generally referred to as 'white land'. At current rates of urbanization, the white lands within the CMM are expected to be completely built within the next thirty to fifty years, assuming that no further land is annexed for development. In a draft strategic vision for the region, the CMM is proposing a minimum density for the whole region. If this policy is implemented, it will affect the both the rate at which the remaining white land is urbanized, as well as the type of urban form which is built.

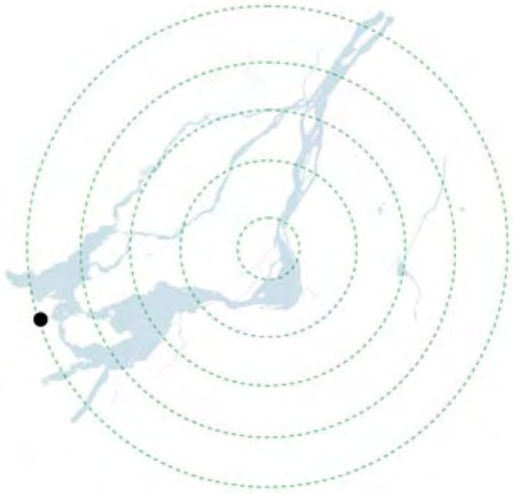
Following the ambitions of the regional government, municipalities in the Montréal region are encouraged to grow their populations and economies. This is contributing to interregional competition for new growth and investment. Since the remaining white land is unevenly distributed across the region, municipalities are required to operate in a variety of ways based on the amount of available land they have for new development or the potential they have for redevelopment.

Since most of the island of Montréal is already urbanized, the primary option for absorbing new growth will be through the redevelopment of underused land. The City of Montréal recognizes this, and in their Masterplan are clearly encouraging reuse and intensification in order to contribute to the growth of the metropolis as a whole. The City is directing energy towards reinvestment highlighting vacant properties and sites with strong potential for redevelopment.

Sites for redevelopment within the city together with the unbuilt white lands located on the fringe make up the overall supply of vacant land. According to the CMM there are approximately 400 square kilometers of vacant land in the region, 20% of which is located on the Island of Montréal. The qualities of these spaces are extremely varied, and typically those with the simplest or most profitable development scenario become the first targets for new growth.

What follows is a series of photographs which samples this land supply showing how it is or isn't being utilized, as well as it's location within the metropolis. Vacant lands within the existing built area as well as sites at the edges of the city have been targeted to illustrate the options that are available for accommodating further growth. Along side the photographs are samples from the discourse on different models of development, namely urban expansion versus urban consolidation.

To guide the reading of this discourse, this sections is organized around the three spheres of sustainable development. Economic, social and environmental perspectives relating to either an expanding or a contracting model of urban development are grouped in order to organize and pinpoint certain issues.



Economic: Urban Expansion

Economically, the arguments for a decentralizing model primarily cite the benefits of a property and home ownership. Owning property presents an investment for long term wealth and an opportunity for buyers to establish assets. While Montréal does have a higher than average proportion of rental housing units, this is in decline due to the nature of most new development.

Additionally, the urbanization of agricultural land tends to greatly increases its economic value. Development on this relatively cheap land keeps the cost of housing down, giving those who would have difficulty buying a property closer to the centre an opportunity to get into the housing market.

For municipalities there is an additional incentive to expand. New residents mean more taxes and income for local governments. This factor serves also to spur interregional competition for new developments, with local bylaws or deals offering incentives in order to attract development to a particular part of the region.

"Home ownership is a principal mechanism for creating individual or household wealth. There is a fundamental difference between purchasing a home and paying rent. By purchasing a home, a household adds to its wealth. Part of the monthly mortgage payment is used to reduce the amount owed and becomes a part of the owner's equity in the home. In contrast, all of the money paid to rent a home that the household does not own goes to the property owner. There is no potential equity for the renter in the rented home."

- Cox, Wendell (p.10)

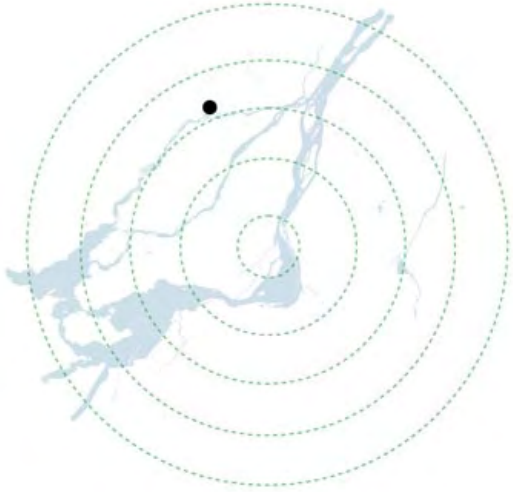
"The relationship between greater affluence, suburbanization and automobile use is not universally appreciated. Montréal is at a crossroads and could lose these advantages if they are not properly understood. Pressure is mounting to adopt policies that threaten housing affordability and to invest in transportation choices that will cost a lot and deliver very little improvement."

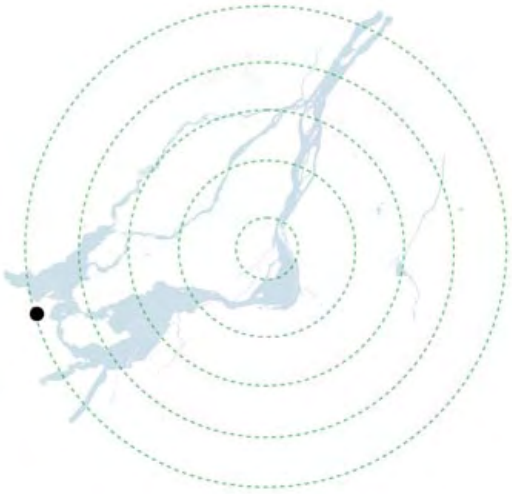
- Cox, Wendell (p.8)

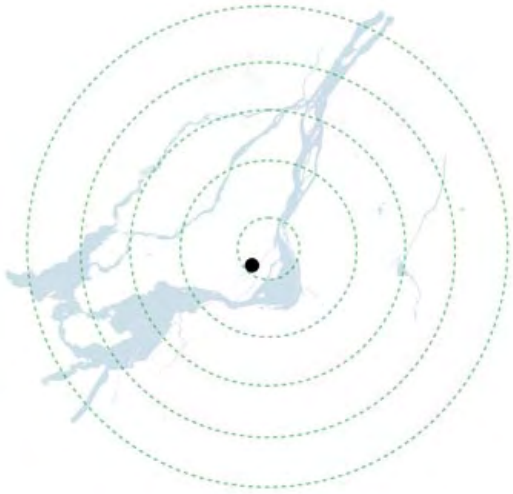
"The suburban idea raised the possibility that land far beyond the previous range of metropolitan expansion could be transformed immediately from relatively cheap agricultural land to highly profitable building plots."

- Fishman, Robert (p.25)


Tyvek







Economic: Urban Consolidation

Those promoting a more intense form of development, where the city is reformed by reusing land that has been previously built upon, argue that a consolidation of urban form around existing infrastructure will optimize the potential of that existing infrastructure.

In it's 2004 Master Plan, the City of Montréal writes "With all the necessary public infrastructure already in place, residential consolidation in the centre will contribute to Montréal's sustainable development."

In a citizen's guide to understanding sprawl, David Gurin of the David Suzuki foundation argues that while the initial affordability of homes on the periphery is attractive to homebuyers, in reality these places are heavily subsidized by municipal governments through the servicing and infrastructural construction and maintainance. The hidden costs of these new developments are essentially absorbed by the taxes that have been paid by the residents who already live there. Gurin also claims that the cost of this new infrastructure increases with distance and decreases with density.

"The City recommends increasing the intensity and diversity of urban activities, particularly in the vicinity of metro and commuter train stations and major public transportation corridors that offer potential for consolidation due to the presence of vacant or underused land. Vacant lots, shopping centre parking lots, park-and-ride centres and other underused lots within reasonable walking distance - approximately 500 metres - from train and metro stations are specifically targeted."

- Ville de Montréal. Master Plan (p. 43)

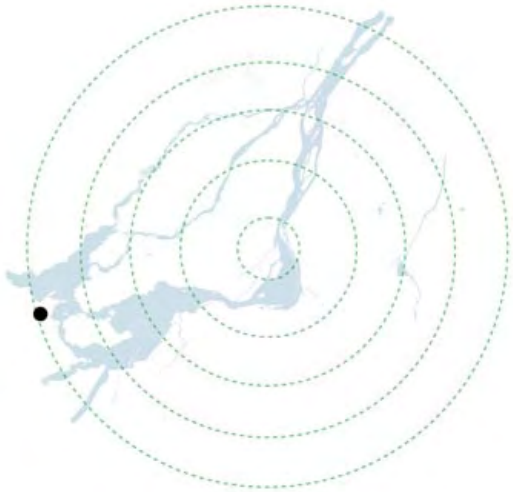
"Many buildings in the Centre have great potential for recycling into housing. With the evolution of certain economic sectors, some firms no longer need large amounts of space. As a result, a number of industrial and office buildings require a new vocation."

- Ville de Montréal. Master Plan (p. 79)

"Many inner cities are serviced to accommodate much larger populations and therefore existing infrastructure is not being put to optimal use. Moreover, greenfield growth on the urban fringe is expensive to service, eats up agricultural, recreational or ecologically significant lands, and deepens car dependency."

- Tomalty, Ray; Alexander, Don. (p.5)


Aurèle-Joliat

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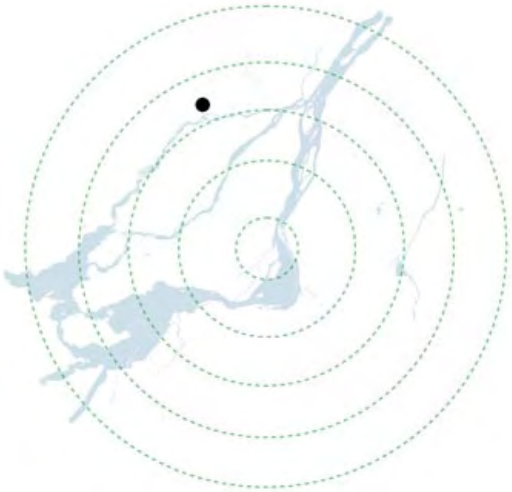
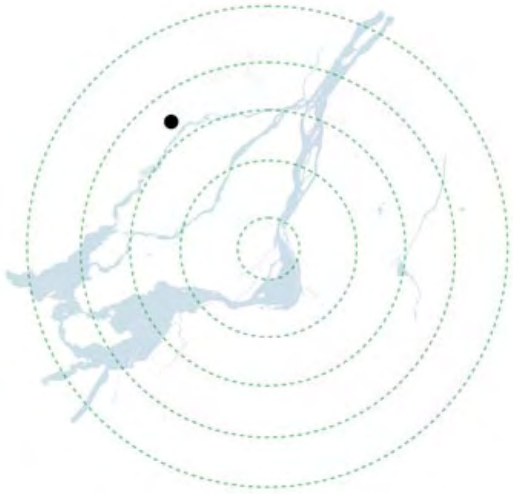




Social: Urban Expansion

"The most convincing answers to the question of why sprawl has persisted over so many centuries seems to be that a growing number of people have believed it to be the surest way to obtain some of the privacy, mobility, and choice that were once available only to the wealthiest and most powerful members of society."

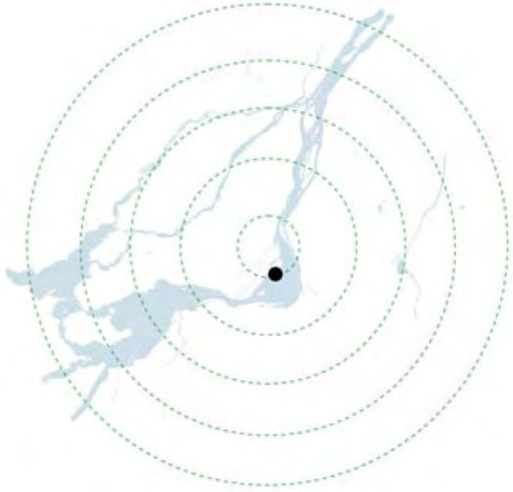
- Bruegmann, Robert (p.111)

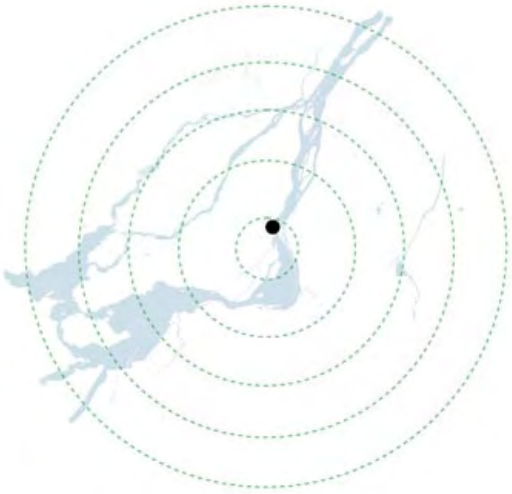
"Although sprawl has developed differently at different times and in different places, the history of sprawl suggests that the two factors that seem to track most closely with sprawl have been increasing affluence and political democratization. In places where citizens have become more affluent and have enjoyed basic economic and political rights, more people have been able to gain for themselves the benefits once reserved for wealthier citizens. I believe that the most important of these can be defined as privacy, mobility, and choice."

- Bruegmann, Robert (p.109)

From a social perspective, a justifying response to the decades of urban expansion is that this growth reflects a lifestyle choice which values privacy and personal space. In a democratic system, suburbanization is illustrative of people 'voting with their feet'. In his book titled *Sprawl: A Compact History*, Robert Bruegmann argues that an expanding city is an inevitable result of an increase in affluence and democracy, and that when given the choice, people choose to inhabit more space and are willing to travel further to have it.

In 1987 Robert Fishman wrote about the transformation of the social ideals that came with an increasingly wealthy middle-class. He writes that "suburbia embodies a new ideal of family life, an ideal so emotionally charged that it made the home more sacred than any place of worship." Fishman refers to the suburbs as a bourgeois 'utopia' in which the elements of living and of working were intentionally separated.





Social: Urban Consolidation

"There are no casual passers-by on cul-de-sac streets and fewer opportunities for casual interactions between people. Sociologists have remarked upon this since the beginning of large-scale suburbanization and it is still true. Auto-dominated suburbs are the antithesis of cities, which have historically been meeting places, full of opportunity for socializing. A recent study showed that people living in walkable neighbourhoods were more likely to know their neighbours, participate politically, trust others, and be socially engaged."

- Gurin, David (p.18)

"The Plan also promotes a greater variety of uses in some areas of the City in order to reduce distances between residences, shops, services and workplaces, again while respecting the characteristics of each area. This will help make these areas more dynamic and increase local residents' sense of belonging."

- Ville de Montréal. Master Plan (p. 6)

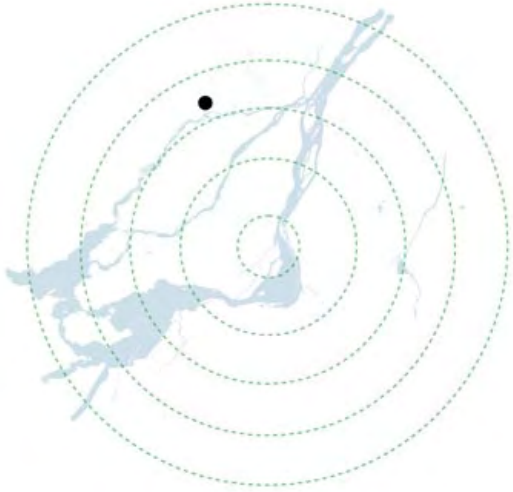
"The downside of sprawl is the loss of things public. We have lost physical community, because car-centered culture is more individual and less group oriented. We have lost something hard to define, which i will call "place."

- Marshall, Alex (p.13)

Many of the social criticisms of suburban developments tend to generalize the form of these neighbourhoods as being homogeneous and therefore exclusive neighbourhoods. David Gurin criticizes developments which limit the variety of uses, housing types, and sizes. He argues that these patterns promote a higher turnover within a community, as when the needs of a particular household change, they must look elsewhere for appropriate housing.

In addition to mixing housing types and sizes, the City of Montréal proposes that with the reduction of distances between residences, shops, services and workplaces, area can become more dynamic and generate a stronger sense of community. This sense of community due to proximity is credited in creating environments in which pedestrians are more likely to meet and trust their neighbours, and become socially engaged.

A final claim advocating consolidation is that the urbanization of agricultural or natural areas at the edges of cities makes it difficult for someone living in the city to access these landscapes.

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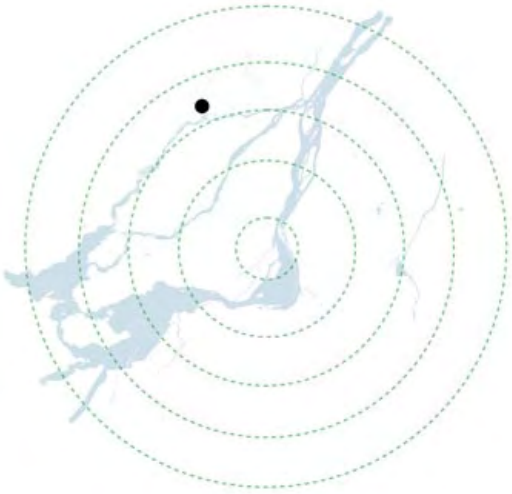


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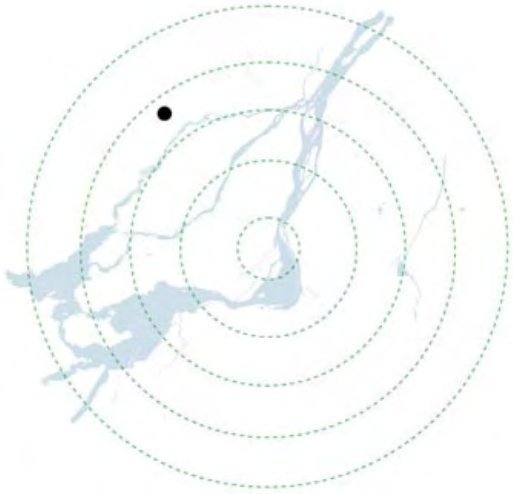


Environmental: Urban Expansion

"Sprawling communities are a major contributor to climate change and air pollution, in part because they require so much automotive transportation, which is heavily dependent on energy consumption from fossil fuels, the biggest source of greenhouse gases. In addition to burning gasoline, sprawling communities have to pump water in and waste out over long distances, deliver natural gas and electricity over long distribution networks, and provide solid waste, recycling pick-up and other services over a much wider area. Each of these services uses more energy and therefore produces more greenhouse gases than providing similar services to denser communities."

- Gurin, David (p. 1)

"As forest cover is cleared for suburban development both the quantity and quality of drinking water decline. Less rainfall is absorbed and returned to recharge groundwater aquifers."

- Gurin, David (p.16)

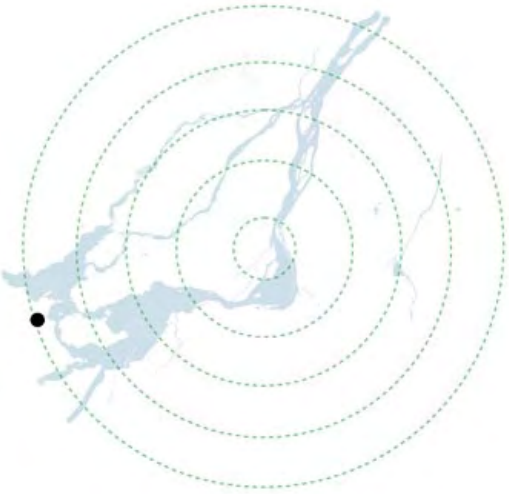
"In our developed societies, the city constitutes the most primary of landscapes, the one we have most directly before our eyes... the city as primary landscape arises at the dawn of the industrial revolution. The city stops being in the landscape, as a sort of monumental signature, to become progressively, in and of itself, landscape."

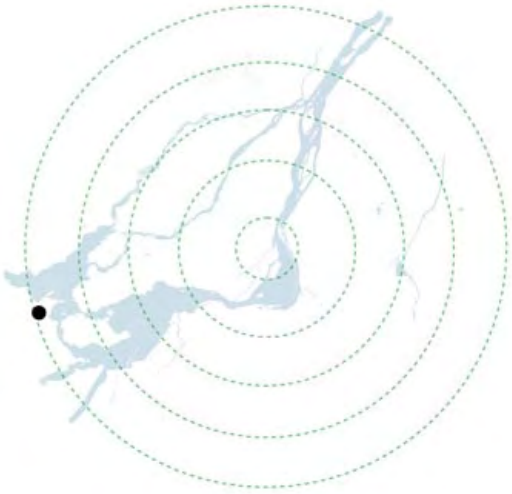
- Picon, Antoine (p.66-67)

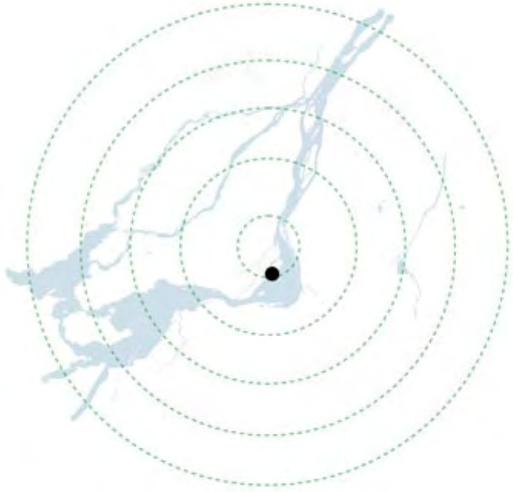
The debate over which model is better for the environment mainly dwells in an argument about which option is more damaging. It is difficult to make claims that any form of urbanization can actually improve the environment.

In a CMHC report on the *Implementation of a 'Smart Growth' Concept*, Ray Tomalty and Don Alexander list the negative environmental implications credited to suburbanization. "Greenfield growth on the urban fringe is expensive to service, eats up agricultural, recreational or ecologically significant lands, and deepens car dependency."

The Suzuki foundation cites this automobile dependency as a major factor in the production of greenhouse gases and, additionally, this output is compounded due to the long distances that must be covered for the distribution of goods and services.







Environmental: Urban Consolidation

"It seems likely that the most effective remedy in this case - as with many environmental problems supposedly caused by sprawl - might be less in restricting or limiting low-density development, energy use or automobile travel (although some of this might be advisable) but, instead, in exploring new ways to solve problems, most of which are the result of using inefficient and old-fashioned energy sources."

- Bruegmann, Robert (149)

"They [anti-sprawl advocates] assume that the resources of today will be the resources of tomorrow and that humans will be unable to discover new ones or harvest the existing ones more efficiently. In other words, sustainability rests heavily on the dubious assumptions of limits to growth."

- Bruegmann, Robert (148)

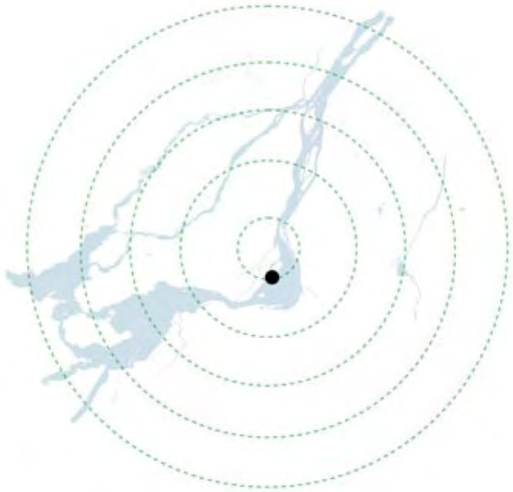
"Suburbanization is no threat to agriculture; in fact, the geographic spread of urban areas is only a fraction of the farmland removed from use because of improving productivity."

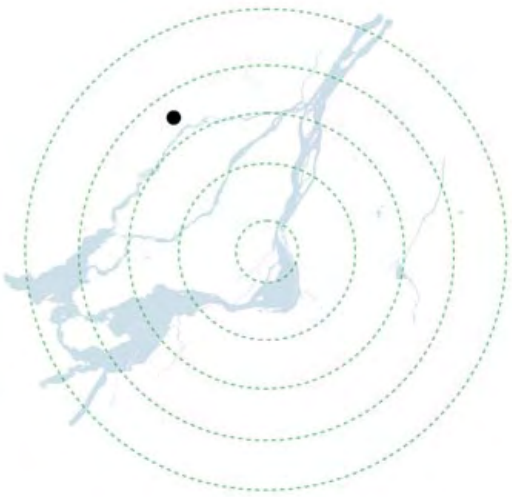
- Cox, Wendell (p.5)

The accusations against environmental degradation due to sprawl are not without criticism. In the defense of a decentralizing model, many have been picked apart for being misguided. Rob Bruegmann argues that many of the accusations are not well founded and are primarily based on moral underpinnings rather than factual information. The claims that sprawl is responsible for higher levels of green house gas emissions are unfairly being directed towards a general pattern of urbanism, and not towards the more specific problems that cause them - the fuel sources and materials we are using.

Wendell Cox makes the case that if the projected growth was completely absorbed through intensification, greenhouse gas emissions will still increase significantly. He cites a report that suggests "doubling urban populations would reduce green house gas emissions from personal vehicles by only five percent". And, in a report specific to Montréal, he argues that low densities work to dilute congestion and air pollution rather than increasing it.

In that report, Cox also points out that due to evolving agricultural technologies, the farming industry requires less land to produce the same amount of food. Since production is not rising significantly, there is a considerable amount of agricultural land that is no longer needed for production.





Conclusion

As each of these perspectives has been drawn from a specific context, compiling them together we can begin to draw some general conclusions in their relevance to the ideals of sustainable development. What is perhaps the clearest is that the interests of particular parties will inevitably be in conflict with one another.

This issue of conflicting interests can be illustrated when policies transcend various scales within a city. For instance, the economic goals of a regional government may set the tone for municipal governments and local residents within the city. However, even if that ambition represented a consensus, many of the steps that would be necessary to act on these ambitions would be difficult to make without struggle. An example of this challenge is found when a governing body attempts to implement urban consolidation and is confronted with a local agenda which discourages density or change. If it is indeed possible to develop a city sustainably, it will not be without some sacrifice and compromise from all parties involved. The process needs to be cooperative and considerate if it is to benefit the general population.

While neither Cox nor Bruegmann claim to be promoting the idea of sustainable development, they make arguments that are essentially contrary to its definition. When Cox makes reference to agricultural land becoming obsolete and Bruegmann alleviates sprawl from the condemnations of CO2 emissions, they illustrate an optimistic sense of faith in the ingenuity of future generations, while at the same presenting them with a burden. These arguments assume a continuity of resources and transfer responsibility of solving the problems of today on to future generations.

Without a strong public discourse revealing and discussing the problems with our processes, we are running the risk of falling into a trap in which we expect at least as much wealth and prosperity as the previous generation, regardless of the implications. This pattern will continue to push the possibility of sustainable development further from reality. If in a democracy we should be able to choose what type of city we live in, then it is important that the choices we have are fair and presented in a way that clearly reveals their consequences.

While it may be easy to redirect blame for the symptoms of our lifestyles and expectations, a much more difficult exercise will be learning from our mistakes and questioning whether or not we, as a society, really need to be in a state of perpetual growth.

Part 3: Landscapes of Potential -- Works Cited

Bruegmann, Robert. *Sprawl: A Compact History*. Chicago: University of Chicago Press, 2005.

Communauté métropolitaine de Montréal. *Charting Our International Future: A Competitive Metropolitan Montréal Region, Economic Development Plan*. February 2005. http://www.cmm.qc.ca/pde/documents/pde05_english.pdf#search=%22pde05_english.pdf%22 [Accessed Sept. 16, 2006]

Communauté métropolitaine de Montréal. *Charting Our International Future: A Competitive Metropolitan Montréal Region, Economic Development Plan. Summary.* Montréal, Communauté métropolitaine de Montréal, February 2005. http://www.cmm.qc.ca/pde/documents/sommaire_ang_05.pdf#search=%22sommaire_ang_05.pdf%22 [Accessed Sept. 16, 2006]

Cox, Wendell. *Housing and Transportation in Montréal: How suburbanization is improving the regions's competitiveness.* Montréal: Montréal Economic Institute, 2006. www.iedm.org/uploaded/pdf/juillet06_en.pdf [Accessed Sept. 16, 2006]

Gurin, David. "Understanding Sprawl: A citizen's guide." Vancouver: The David Suzuki Foundation, 2003. http://www.davidsuzuki.org/files/Climate/Ontario/Understanding_Sprawl.pdf#search=%22understanding%20sprawl%22 [Accessed Sept. 16, 2006]

Fishman, Robert. "Bourgeois Utopias: Visions of Suburbia" *Readings in Urban Theory*. Ed. Susan S. Fainstein and Scott Campbell. Oxford; Malden, Mass.: Blackwell Publishers, 2002.

Latouche, Serge. "Would the West actually be happier with less? The world downscaled." *La Monde Diplomatique*. December 2003 http://www.hartford-hwp.com/archives/27/081.html [Accessed Sept. 16, 2006]

Marshall, Alex. "Wrestling the Beast Called Sprawl." *Critics talk about smart growth: reversing sprawl, redefining suburbs, revitalizing center city*. May 11, 2000, Fellows Program, Century Club, New York. New York: Institute for Urban Design, 2000.

Meadows, Donnella; Randers, Jorgen; Meadows; Dennis. *Limits to Growth*. White River Junction: Chelsea Green Publishing, 2004

Picon, Antoine. "Anxious Landscapes: From the Ruin to Rust." *Grey Room: Architecture Art Media Politics,* no. 1 (Fall 2000): 64-83. Cambridge, MA: MIT Press. 2000. www.gsd.harvard.edu/people/ faculty/picon/ruinerouille.pdf [Accessed Sept. 16, 2006.]

Région métropolitaine de Montréal. *Une vision d'action commune: Cadre D'aménagement et Orientations Gouvernementales 2001-2021,* Affaires Municipales et Régions Québec, Québec, 2001. http://www.mamr.gouv.qc.ca/publications/amenagement/cmm_cadre_fra.pdf#search=%222-550-37847-4%20%22 [accessed sept. 16 2006]

Statistics Canada, Population Projections for Canada, Provinces and Territories, 2005 - 2031, Minister of Industry, Ottawa, 2005. http://www.statcan.ca/english/freepub/91-520-XIE/0010591-520-XIE.pdf [Accessed Sept. 16, 2006.]

The New Oxford American Dictionary, 2nd Edition, Erin McKean (Editor), Oxford University Press, 2005

Tomalty, Ray; Alexander, Don. *Smart Growth in Canada: Implementation of a planning Concept*. Ottawa: Canada Mortgage and Housing Corporation, 2005. http://www.smartgrowth.ca/research/SmartGrowth.pdf [Accessed Sept. 16, 2006]

Ville de Montréal. Master Plan. Montréal, 2004 http://ville.montreal.qc.ca/portal/page?_pageid=2762,3099643&_dad=portal&_schema=PORTAL [Accessed Sept. 16, 2006.]

Map and Image Sources

All Photographs by Author

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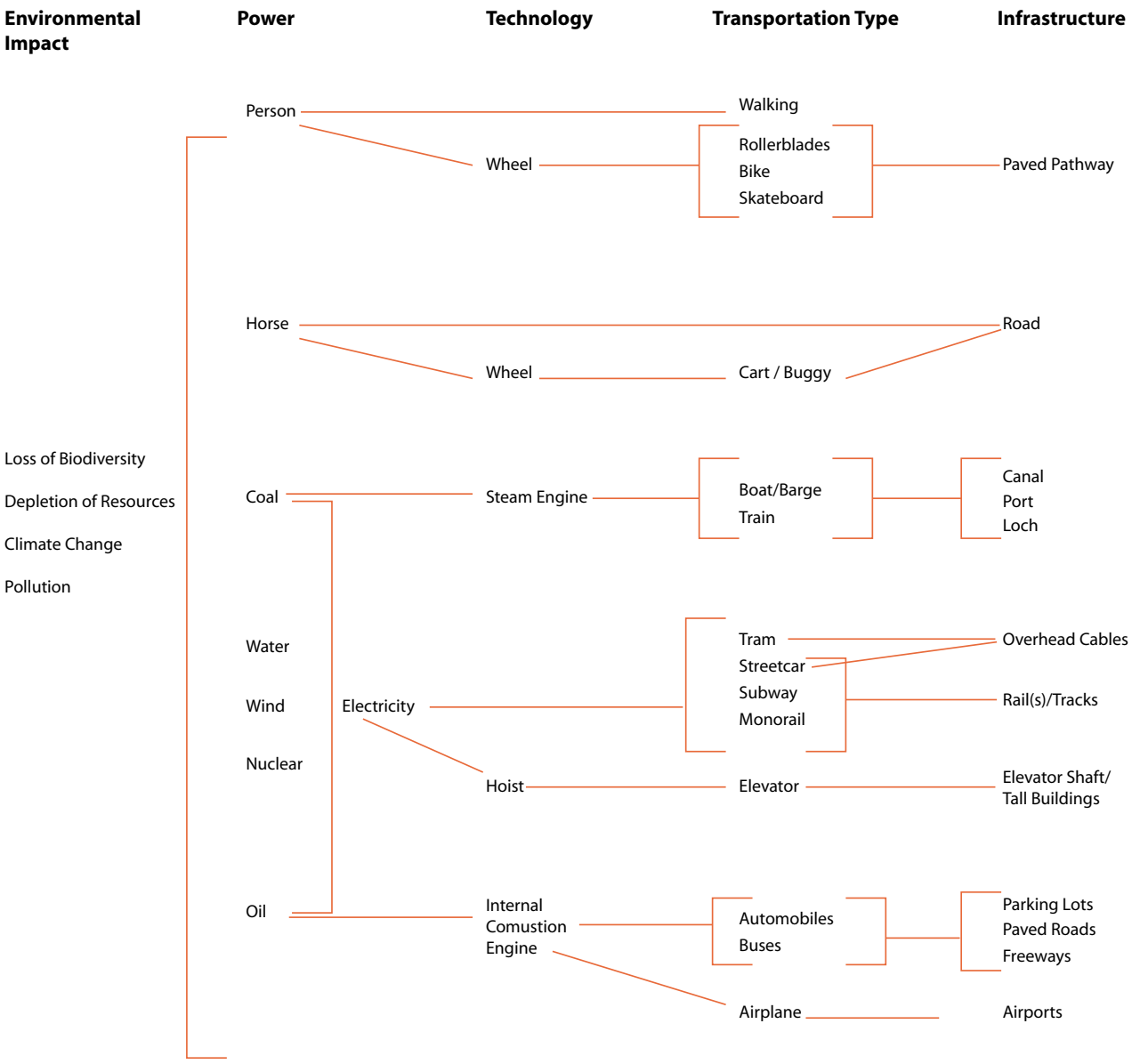
CanMap Streetfiles v2005.3 (CanMap Water) [Computer file] 2005. Markham, ON: DMTI Spatial, Inc. Available : McGill University Library.Controlled Access. http://www.edrs.mcgill.ca/GIS/data/dmti/CensusBoun/arcview/2001census/water/CANwat.zip
[Accessed July 4, 2006.]

Charts:
Larouche, Pierre. *Montréal et l'urbanisme : hier et aujourd'hui*. Outremont : Villes nouvelles, villes anciennes, 1990. p.89, 91.

Population Maps:
Adapted from: Ville de Montréal, Réussir Montréal : [plan d'urbanisme] / Ville de Montréal. Ville de Montréal, Montréal 1993. (p. 16); Ville de Montréal, City Planning Department. Urbanisation, a study of urban expansion in the Montréal region. Montréal : Service d'urbanisme de la ville de Montréal, 1968 (p. 30); Communauté métropolitaine de Montréal. "Grandes Affectations du Sol (2001)". Plan métropolitain de gestion des matières résiduelles.(June 20, 2002) http://cmm.qc.ca/pmgmr/documents/documents/rapportchamard/annexe8_carte02_A0.pdf [Accessed August 29, 2006]

Population Values:
1793 - http://www.heritageMontréal.qc.ca/hm_en/gui3_en.htm
1867,1907 - http://www.sallys-place.com/food/dining_directory/north_america/motreal.htm
1931,1951, 1961, 1971, 1981 - http://www.demographia.com/db-cancma.htm
2001 - http://www.stat.gouv.qc.ca/donstat/société/demographie/dons_regnl/regional/3p5.htm

Vacant Land:
Adapted from: Communauté métropolitaine de Montréal. "Grandes Affectations du Sol (2001)". Plan métropolitain de gestion des matières résiduelles.(June 20, 2002) http://cmm.qc.ca/pmgmr/documents/documents/rapportchamard/annexe8_carte02_A0.pdf [Accessed August 29, 2006]


Environmental Impact
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Depletion of Resources
Climate Change
Pollution
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Skateboard
Paved Pathway
Horse
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Cart / Buggy
Coal
Steam Engine
Boat/Barge
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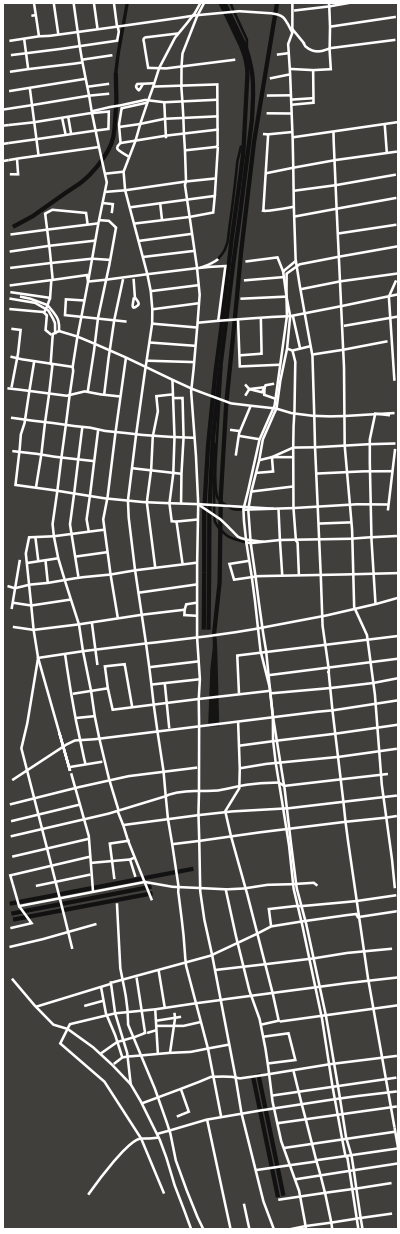
Connect / Disconnect:
a sectional investigation of the infrastructures along a transportation corridor

--Nancy-Ann Wilson



"Overlaid onto a finely gridded block and street pattern, the freeway down-grades or eliminates those streets of the grid not corresponding to its exit spacing…With regard to urban transformation, what is most significant about a freeway is not what it connects on an interurban scale, but what it disconnects on a local scale."
-Pope, Albert (p. 108)

If the human race is to sustain itself in the future this survival will be directly related to changes we make in the way we conceive of and use transportation. The methods we used to move both goods and people are depleting resources at an alarming rate and are responsible for a large portion of the world's pollution and ensuing climate change. This holds true in Québec, where the transportation sector is responsible for approximately one-half of the province's greenhouse gas emissions. Change is necessary.

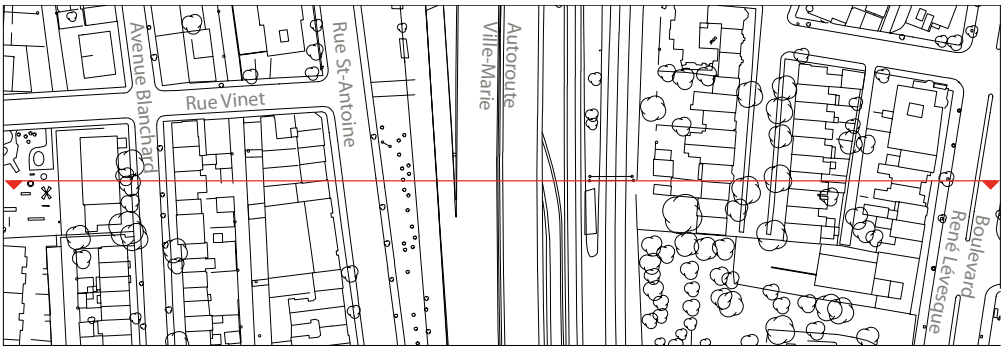
Historically, changes in transportation and its infrastructure have greatly affected both the form of the city and how inhabitants experience it. During the 60's and 70's, Montréal was "Thinking Big"(as a recent exhibition and publication by the Canadian Centre for Architecture proved) and a number of large scale projects were executed. Among these were the Metro and an East-West expressway. The Metro was finished in 1966; the Ville-Marie expressway (Autoroute 720) was finished in 1974.

At the time, Montréal was the first sizeable city in the world to incorporate, on a large scale, Modernist and Futurist ideas of the vertical separation of transportation types. Today, along the Ville-Marie expressway, roughly between Rue Atwater and Rue Sanguinet, there exists a corridor with a high intensity of types of transportation infrastructure, including an expressway, arterial and local roads, a subway line, train tracks, and indoor and outdoor pedestrian walkways.

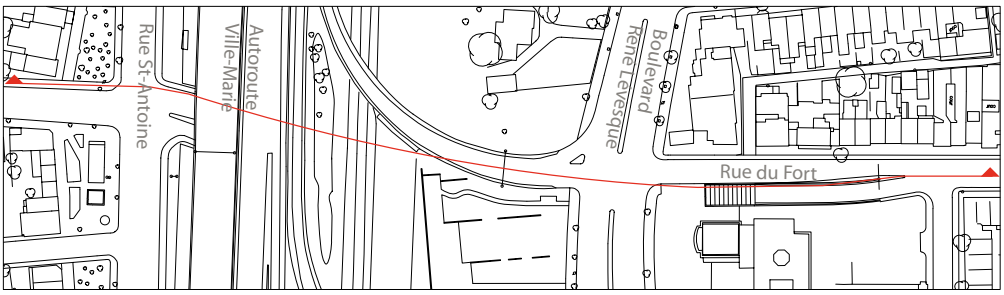
Albert Pope outlines the development of the urban grid over the 19th century and its subsequent destruction in the 20th. North American cities are now what he refers to as ladders. The grid—a simple system that allows enormous complexity of organization and routes between destinations—has been truncated and fragmented, leaving a city of enclaves with few points of connection to each other. In his history of the destruction of the urban grid, the expressway is one of the initial antagonists, set down on the city and blocking connections on either side of it. As a result "alternate pedestrian armatures" are created. These are the above/below ground pedestrian networks which navigate around the freeways, connect to parking garages and office buildings, and begin to turn the city outside-in.

Montréal, although not mentioned explicitly in Pope's text, stands as a typological example of this development of the city. Ironically, the Ville-Marie expressway, intended as a piece of infrastructure connecting one end of the island to the other, has actually created a large divide in the city. However, Montréal has recognized the deleterious effects of the schism created by the Ville-Marie and has attempted to remedy the problem by burying it under a large portion of downtown and restoring the original grid.

Pope's analysis is illuminating in its elucidation of many of the effects of the subversion of the urban grid. However, his discussion, which

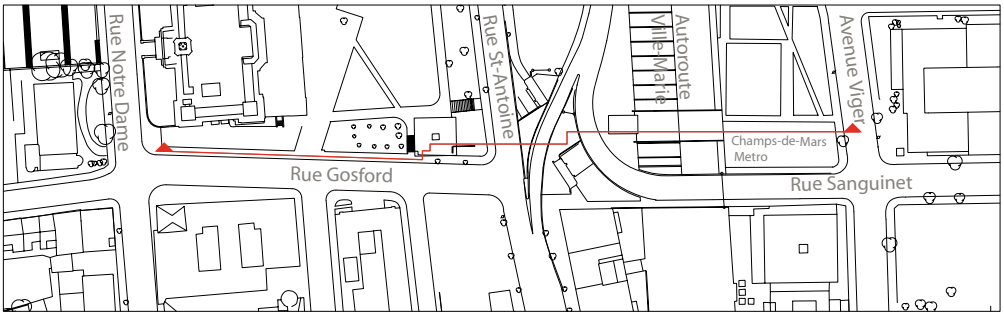


Section 1



Section 2

Section 3



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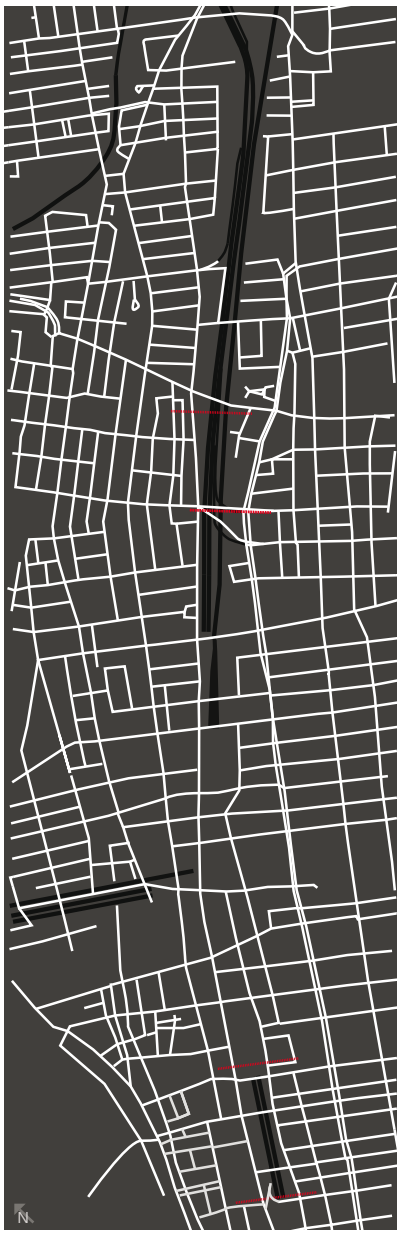
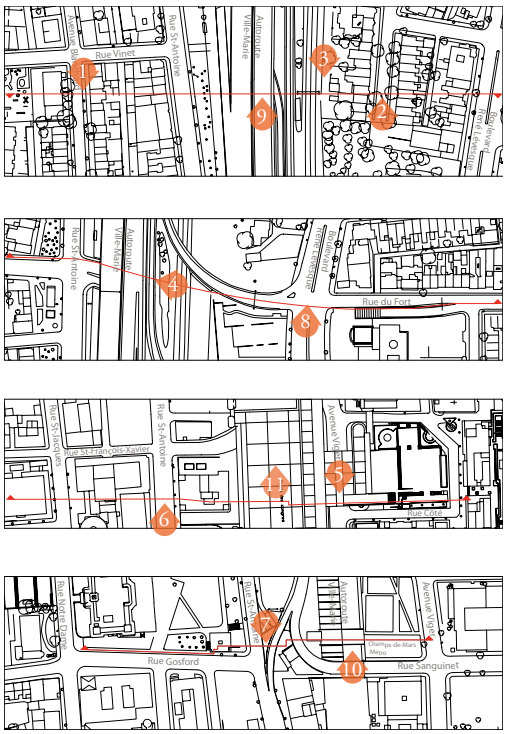


Above: This diagram shows the fragmentation of Montréal urban grid (white) by other transportation infrastructures--the Ville-Marie Expressway and train tracks (black). The four areas of sectional investigation are marked in red. (Numbers 1-4 starting from top.)

Left: Context maps for Sections 1-4.

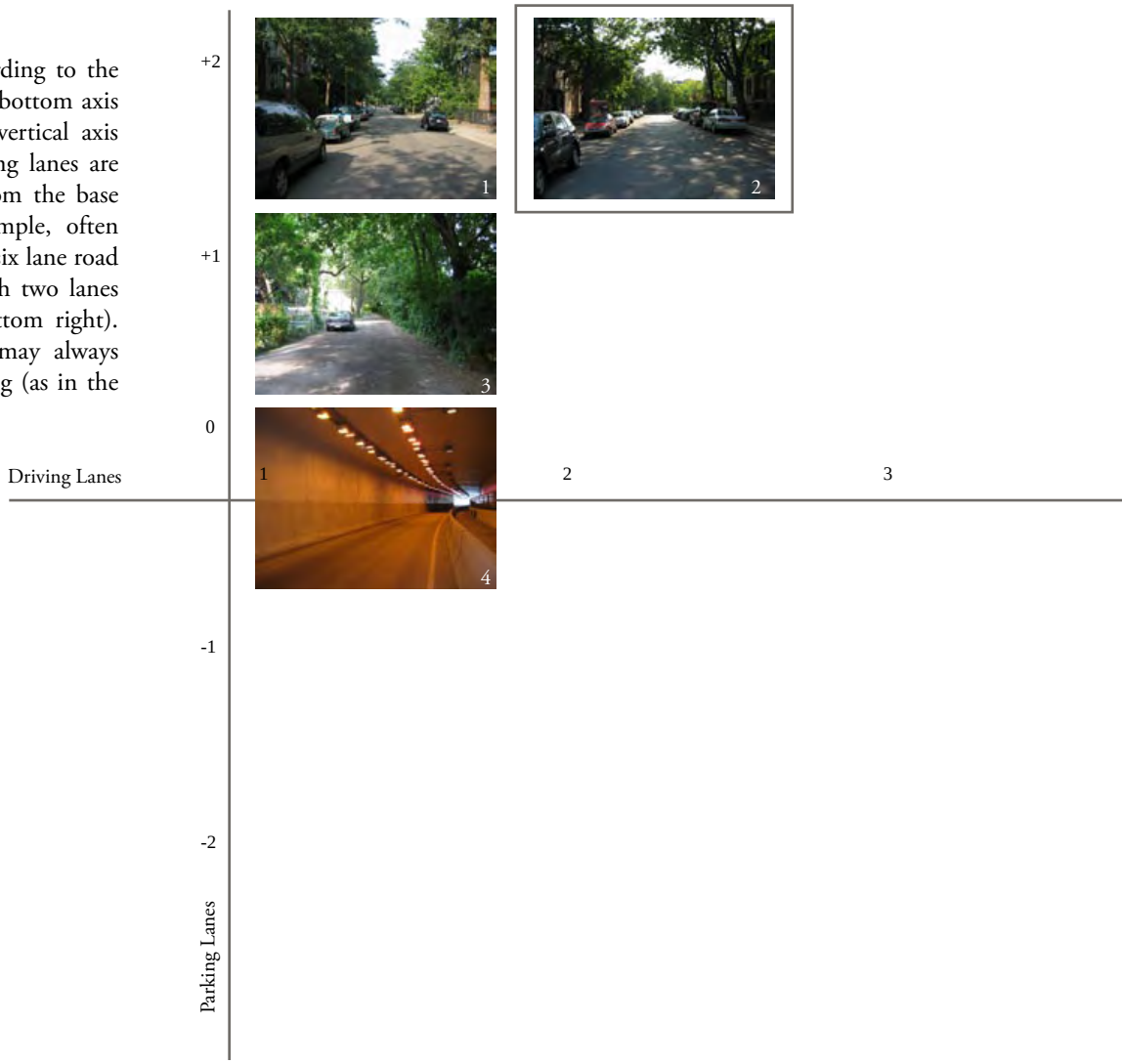
implicitly criticizes the hegemony of the automobile, fails to address both the impact of the laddered city on other types of travel (including pedestrian) and the related user experiences. Furthermore, much of the literature that addresses urban issues, ignores the actual experiences of inhabiting and moving through the city. This chapter attempts to address this void in the discourse through a specific investigation—at a human scale—of the experiences in and around one the generators of the ladder in Montréal—the transportation corridor between Rue Atwater and Rue Sanguinet.

This investigation is based on an analysis of four sections taken perpendicularly across this transportation corridor. (See diagram p.99.) The first part of this chapter--"Connect: Transportation Infrastructure Types"--is a short photographic study of the six transportation infrastructures found along these sections. The second part of the chapter--"Disconnect: Pedestrian vs. Expressway"--is concerned specifically with the experiences and infrastructures of the pedestrian and expressway drivers along these four sections. The relationship between the expressway and the pedestrian networks are often antagonistic, as they are typically mutually exclusive. Thus, a comparison between the two is both rare and fruitful.



Local/Arterial Roads

This photo study is organized according to the number of driving lanes. Along the bottom axis is the base number of lanes. The vertical axis to the side indicates whether parking lanes are in addition to or are subtracted from the base number of driving lanes. For example, often during the non-peak times of day, a six lane road might become a four lane road with two lanes available for parking (as in the bottom right). Conversely, a local one-way road may always have two additional lanes for parking (as in the top left).



Connect: *Transportation Infrastructure Types*

Expressway

The Ville-Marie expressway exist in three distinct conditions. To the west of downtown, it is elevated; through downtown it tunnels under the city; and to the east of downtown it is in a trench, sunken but uncovered.


9


10


11

4 5 6


5


6


7


8

Outdoor Pedestrian Network

The separation pedestrians sense between themselves and nearby traffic affects their level of comfort due to their perceived (and to some degree, real) safety. Parked cars and a succession of regular objects (such as light standards, bollards, or trees) along the side of the walkway each provide a degree of separation from traffic, thus increasing the sense of security for pedestrians.

Another factor that affects how "pedestrian-friendly" a street is percieved to be is sidewalk width. Since multiple objects along the edge of a sidewalk serve to reduce the useable, degree of separation from traffic and sidewalk width can work against each other. In this study sidewalks have been classified based on the number of degrees of separation from traffic and, within that system, divided according to width: narrow (<2m) on the left and wide (>2m) on the right.

Zero Degrees


12


13

One Degree


14


20


21


25

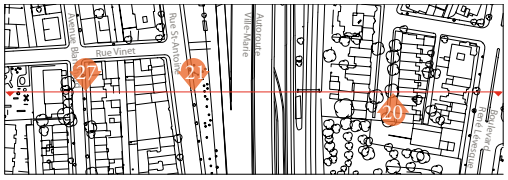

26

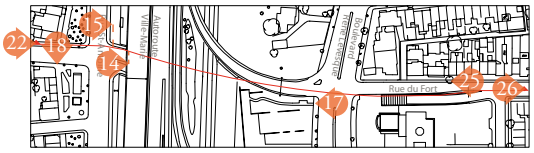
Two Degrees

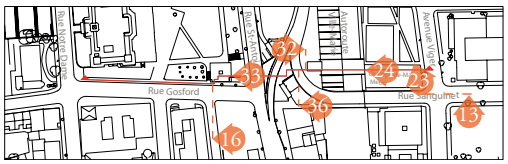

15


22


27







Possible ways to move between levels.

Stairs
Escalator x 2 Directions


31

Stairs
Escalator x 1 Direction


32

Stairs


33


16

Complete Separation


17


18

Pedestrian Only Space


19


23


24

Indoor Pedestrian Network

Montréal's indoor pedestrian network navigates under, through, and above the surrounding city.

Above grade


28

At grade


29

Below Grade


30

Variations

Views


34

Commercial Activity

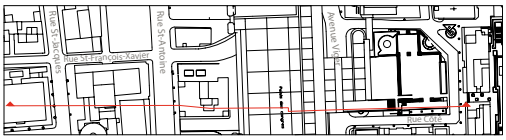

35

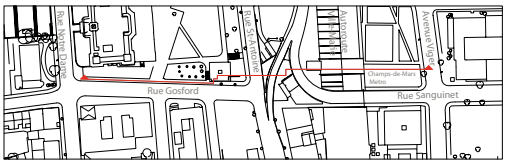
Light wells


36

The Metro

No matter which stop you begin at and which you end at, the basic experience of riding the Metro is unchanging.
-Arrive at platform.
-Wait for train.
-Train arrives.
-Embark and ride.
-Disembark and exit.





38

Physically separated cycling lane

Designated cycling street

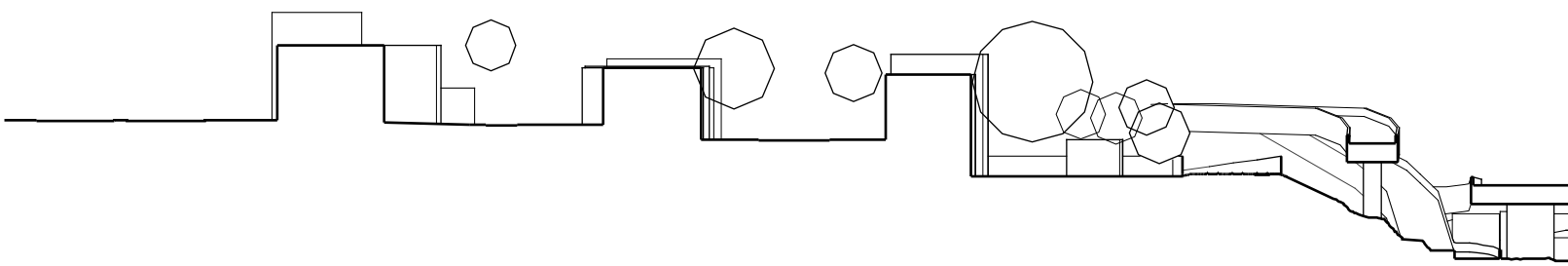
Designated cycling lane

39

On-street cycling

Cycling Network

The city of Montréal is touted as one of the best biking cities in North America. According to Montréal's latest transportation plan, there are four types of cycling infrastructure around the island. However, in the sections examined here, only two of those types appeared. Along the transportation corridor, the cyclist is largely neglected.



Disconnect: *Pedestrian vs. Expressway*

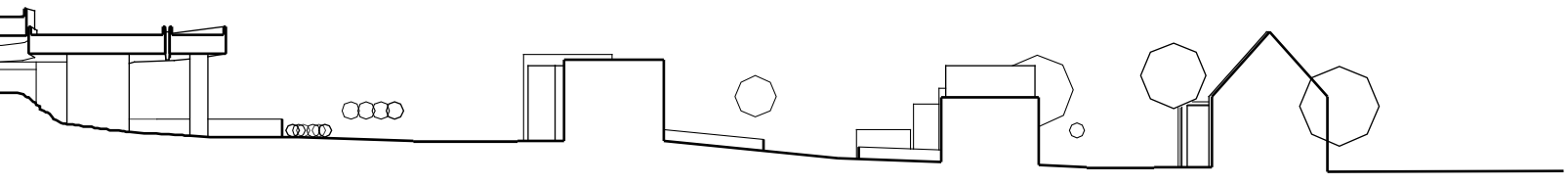
Section 1

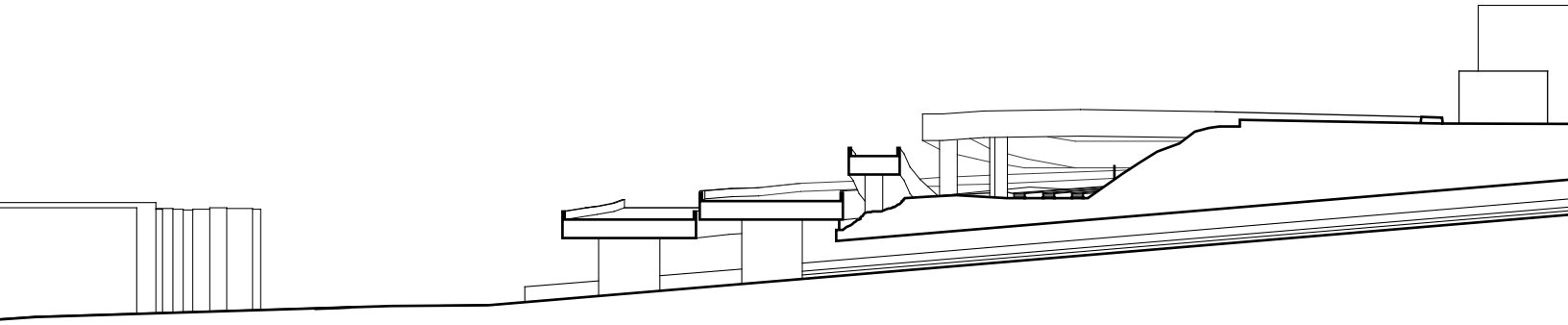
The first section looks east and is taken between Atwater and Rue du Fort, where the infrastructural threads of the transportation corridor are beginning to collect. The Ville-Marie is elevated and adjacent to an embankment, which acts as a natural divide in the city. However, with the addition of the elevated expressway, a significant barrier exists between the two residential neighbourhoods adjacent. Even without the trees that serve to block views to the expressway, residents on either side have no visual access to each other's buildings.

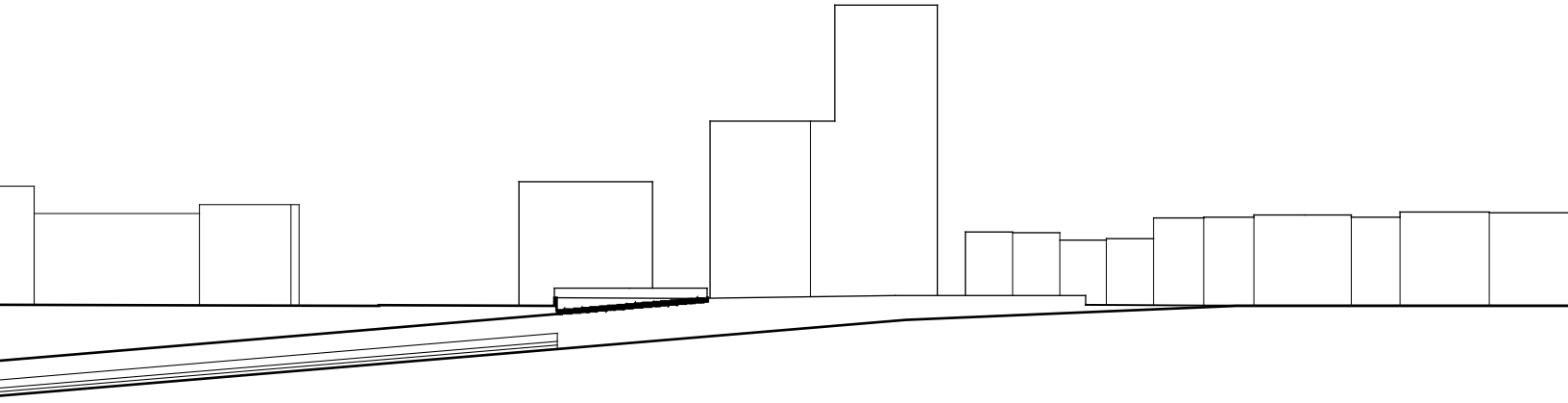
Auto-routes are the worst offenders in Montréal in terms of traffic noise. The Québec Transport Ministry (MTQ) has found noise levels associated with them to cause sleep disturbances and concentration problems. As the expressway is sandwiched between two residential neighbourhoods at this point, high noise levels are an issue. It is unlikely that the situation will improve as the province (who owns and is responsible for the Ville-Marie) sees this road as an essential part of its shipping network. The province is interested in reducing personal vehicle use on the Ville-Marie largely so that it can accommodate more commercial shipping.

In this section, there is little to no accommodation of pedestrian traffic wishing to move north-south. For a pedestrian to travel from one side of the expressway to the nearest residential street on the other side, a distance of 115 m, that person must travel either approximately 500 m or 1 km, depending on the route they choose.

For drivers however, this stretch of the expressway is rather interesting. In the eastbound lanes, drivers have a view of the southern part of Montréal toward the water and an impressive view of the city skyline is just emerging. The speed limit is 70 km/h but during non-peak times, traffic generally flows well above that limit. During peak times in the morning, expressway traffic on the island still averages between 48-60 km/h, well above the 22-28 km/h achieved on arterial roads.







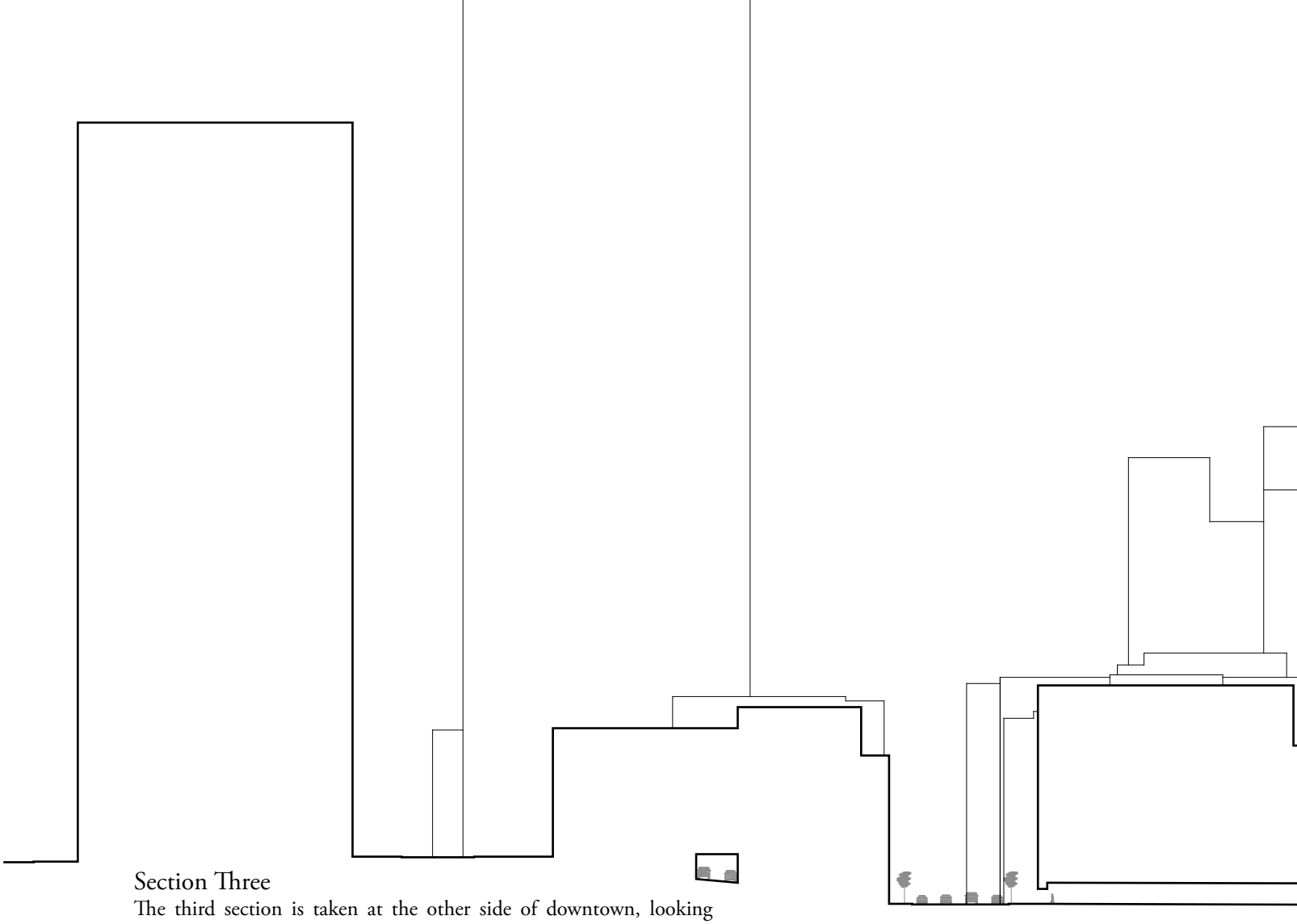
Section 2

Looking west on Rue du Fort, Section 2 is only 230 m from Section 1. However, the pedestrian condition is quite different. The expressway is still elevated and its environmental effects, including pollution and noise remain. Again, it blocks views from one part of the city to the next. The experience of drivers is still quite pleasant: no intersections, great view, and quick travel.

The main differences between the two sections are the Metro stop at St. Antoine and Rue du Fort, and the north-south vehicular and pedestrian tunnel that runs underneath the train tracks and expressway. Because the tunnel curves, it offers no visual connection between the cross-streets at its top and bottom.

With the Metro at its base, the tunnel is well used by pedestrians. However, the experience of walking the tunnel is long and disagreeable. Noise from passing cars is magnified and echoes continuously off of the hard surfaces. The proper place for cyclists is unclear; they sometimes ride on the sidewalk and at other times barrel down the vehicular lane. The lighting is designed for drivers. As a result, the surfaces of the tunnel generally appear smeared, yellow, and dirty. The smell ranges from unnoticeable to unpleasant. For nearly 200 m, the scenery does not change.

Having the tunnel with pedestrian access between the areas north and south of the Ville-Marie is certainly an improvement to having no access (as in Section 1). However, the Pedestrian Charter produced by the city of Montréal states that these tunnels are a last resort as they make pedestrians feel unsafe. Vehicles move through the tunnel at unsettling speeds and in terms of personal safety, exits are limited and distant. It is clear than in the organization of infrastructure in this section, the pedestrian was last to be considered.



Section Three

The third section is taken at the other side of downtown, looking west. It cuts through a corridor of the indoor pedestrian network (or RESO) that runs through the Palais des Congres, the entrance to Place d'Armes metro, and connects to the Guy-Favreau Complex on Rene Levesque.

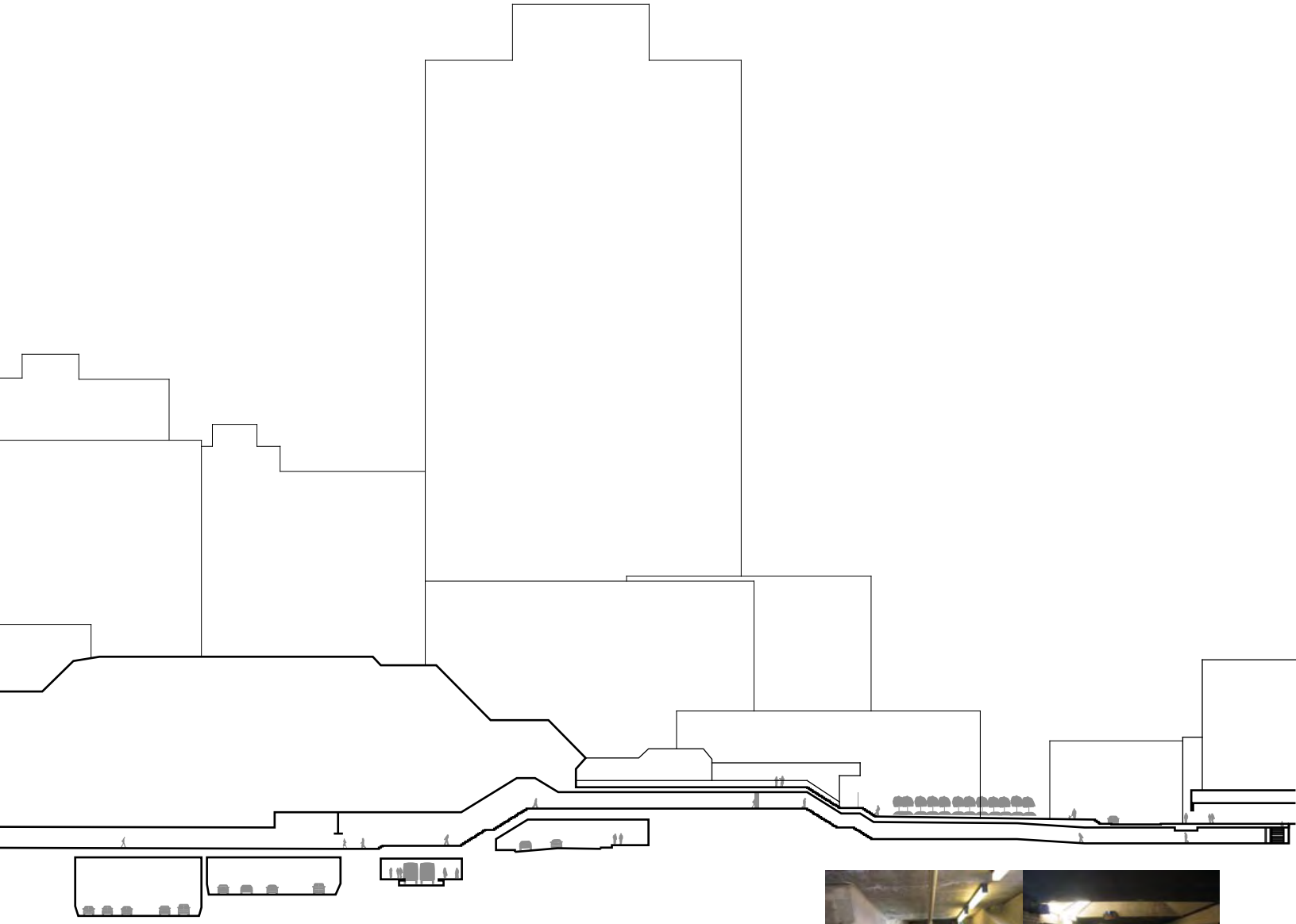
Palais de Congres was the first building to be built over the Ville-Marie expressway, which was originally a trench in this location, much like the Decarie expressway is now. The covering of the Ville-Marie significantly repaired the urban fabric in the area, reducing the schism that existed between the Old City and downtown.

This covering of the expressway mitigates some of the environmental effects present in the previous two sections. Noise is diminished and air pollution is reduced because the tunnels are ventilated and filtered.

The experience of driving the expressway tunnel is one of higher stress than when it is unenclosed. It has a multitude of lanes; it is dark, and often the end of the tunnel is not visible. The promise of the city skyline as viewed by drivers from the locations of Section 1 and Section 2 is unfulfilled as they pass it by underground.

Common complaints about the RESO are that it is difficult for pedestrians to orient themselves within it. However, this difficulty is not the rule. The newly renovated Palais des Congres succeeds in being a recognizable place within the underground pedestrian system. It has windows, natural light, and appropriate signage. However, once a pedestrian descends underground into the grim dark tunnel that connects to Guy-Favreau, these criticisms are validated.

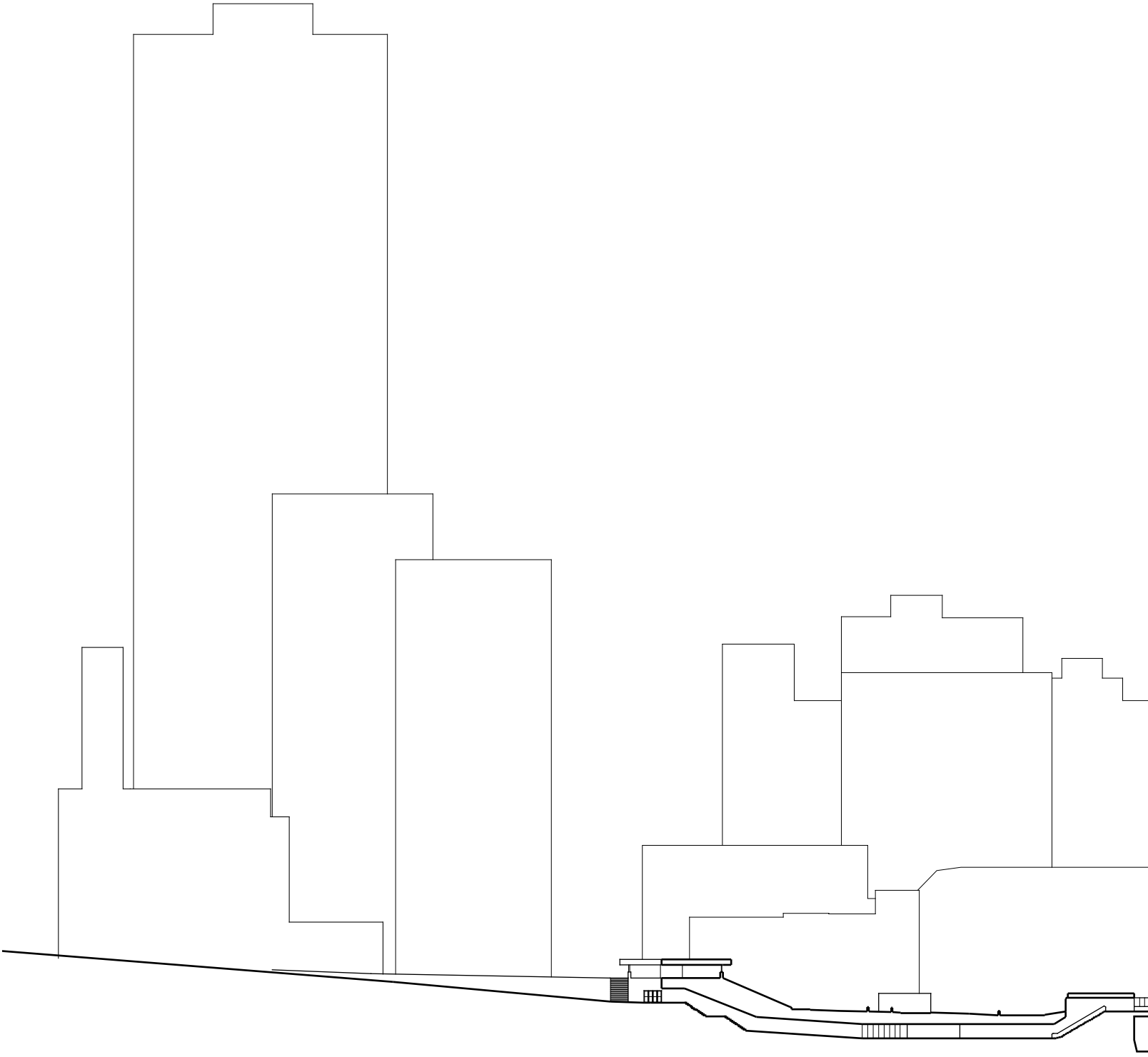
It should also be noted that this interior network is useful only to those who are without mobility difficulties. Only one elevator exists to

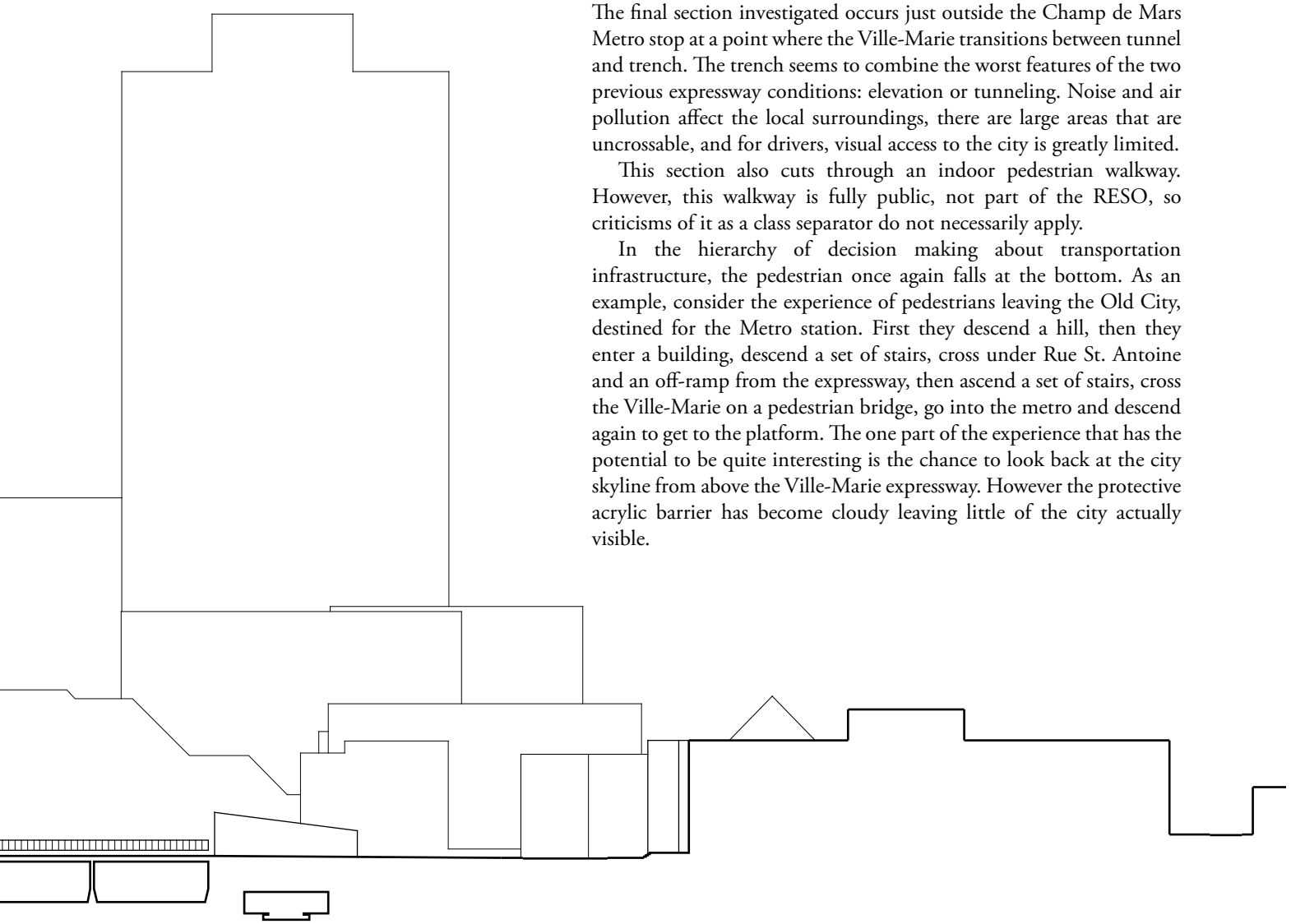


service this part of the RESO, so people with wheelchairs or pushing strollers are relegated to the sidewalks outdoors. Since the Metro stop is likely the major source of pedestrian traffic through this part of the RESO, this lack of accessibility may be moot, as not a single metro station in Montréal is accessible.

Pedestrians have obviously been considered in the area uncovered by Section 3. At first reading, it appears that, in fact, the hierarchy between pedestrian and expressway driver has been inverted, with the expressway existing under the pedestrian infrastructure. However, what is actually occurring is that the pedestrian thread is accommodating each of the other threads of infrastructure that cross it.

Criticisms of the lack of daylight in the RESO, or its tendency to disconnect people from the city, are often met with the same protest: "Oh, but in the winter… ." The cold weather encourages many to use the RESO. Trevor Boddy, in "Underground and Overhead: Building the Analagous City" criticizes similar pedestrian systems for acting as class separators. In winter, interiority equates to privilege as only the acceptable public is allowed indoors.





Section Four

The final section investigated occurs just outside the Champ de Mars Metro stop at a point where the Ville-Marie transitions between tunnel and trench. The trench seems to combine the worst features of the two previous expressway conditions: elevation or tunneling. Noise and air pollution affect the local surroundings, there are large areas that are uncrossable, and for drivers, visual access to the city is greatly limited.

This section also cuts through an indoor pedestrian walkway. However, this walkway is fully public, not part of the RESO, so criticisms of it as a class separator do not necessarily apply.

In the hierarchy of decision making about transportation infrastructure, the pedestrian once again falls at the bottom. As an example, consider the experience of pedestrians leaving the Old City, destined for the Metro station. First they descend a hill, then they enter a building, descend a set of stairs, cross under Rue St. Antoine and an off-ramp from the expressway, then ascend a set of stairs, cross the Ville-Marie on a pedestrian bridge, go into the metro and descend again to get to the platform. The one part of the experience that has the potential to be quite interesting is the chance to look back at the city skyline from above the Ville-Marie expressway. However the protective acrylic barrier has become cloudy leaving little of the city actually visible.

Conclusion

The transportation corridor, devoted to motorized travel has left the pedestrian disadvantaged. It is the pedestrian who must accommodate by going up, down, or around infrastructure for other types of transportation. The covering of the Ville-Marie does seem to have had a positive impact on the walkability of the city. However, this move is questionable as it serves to disconnect drivers from the city. Furthermore, while the negative effects in the immediate area are reduced, the Ville-Marie is still a part of a system that in itself has a significant negative environmental impact.

The indoor pedestrian network is certainly more comfortable for people during the cold of winter. Furthermore, it contributes to pedestrian safety as it reduces the number of interactions between vehicles and walkers. However, in most cases this reduction is due to the fact that the pedestrian is forced to change levels—making the pedestrian experience more arduous than it need be and thereby creating deterrents to walking in the city. If Montréal is serious about reducing its number of non-motorized trips, this needs to be taken into account.

Is this how the city should be experienced? [click here]

Part 3: Connect / Disconnect -- Works Cited

Boddy, Trevor. "Underground and Overhead: Building the Analagous City." *Variations on a Theme Park: The New American City and the End of Public Space*. Ed. Michael Sorkin. New York: Noonday Press, 1992. 123-153.

Pope, Albert. *Ladders*. Houston, Tex.: Rice School of Architecture; New York: Princeton Architectural Press, 1996.

Ville de Montréal. *Plan de Transport: Portrait et diagnostic*. June 1, 2005. http://www.ville.montreal.qc.ca. [Accessed August 13, 2006.]

Ville de Montréal, Service des infrastructures, transport et environnement, Direction du transport-planification et grands projets, and Division du transport. *Chartre du pieton: Portrait et Diagnostic*. June 2006. www.ville.montreal.qc.ca. [Accessed July 28, 2006.]

Map and Image Sources

All photographs, charts, and drawings by Author.

All maps adapted from:
Ville de Montreal. *Cartographie de base numérique 1/1000* Map Numbers: 31H12-010-0236; 31H12-010-0136; 31H05-010-3934; 31H05-010-3834. [computer file]. 1:1 000, Montréal: Ville de Montréal, 2001.

Des Seigneurs Community Garden History: Creation of a Space for a Sustainable Practice

From Tenements to Vegetables

--Catherine S. Vandermeulen

In describing the concept of sustainability, many organisations refer to the Brundtland Commission, named after the former Prime Minister of Norway, Gro Harlem Brundtland, who chaired it. There are two other key public figures associated with the series of World Commissions on Environment and Development: Maurice Strong and Ignacy Sachs. Strong was the secretary general of the United Nations (UN) world conference on the Environment and Development in 1992 also known as Rio or the Earth Summit. Long before, Ignacy Sachs, a socioeconomist, had already participated as an advisor to the 1972 Stockholm conference (known as the United Nations Declaration on the Human Environment) and he advised again in the 2002 Johannesburg conference. Today Sachs is pursuing his work on éco-developement with Agence 4D in France and teaches at the Paris HESS (Ecoles des Hautes Etudes en Sciences Sociales).

One of the publications Ignacy Sachs co-authored with Dana Silk (manager of the Ottawa EnviroCentre) is a report entitled *Food and Energy: Strategies for Sustainable Development* published by the UN University Press in 1990 reviewing the activities of the Food and Energy Nexus program launched by the UN in 1983 to investigate the relation between food and energy related problems. Amongst the themes discussed in this publication are alternative strategies of development, the challenges of biothechnology, integrated food-energy systems and urban agriculture. In effect, the fifth chapter of this report is entirely dedicated to the idea of urban agriculture opening with the question: A Utopian Dream? This first question is one that many publications[1] on urban agriculture contend with while building their line of reasoning. Is there in fact a contradiction between agriculture and the city? If it is not imagined as a replacement for traditional systems of agriculture, but rather as a parallel system, the notion becomes more plausible. As Sachs & Silk (1990) conclude:

> *It is clear that urban agriculture cannot replace other strategies (thus income redistribution programmes must continue), but it has the advantage of generating independence. It uses many of the principles of self-reliant, local development based on initiatives that can be undertaken directly by local people using resources already available in the community. Urban agriculture also establishes direct links between the actions and outcomes while minimizing the risk of benefits being diverted to more powerful urban groups.*

Urban agriculture (which we here take to be any form of food production within city limits), unlike many other urban strategies, takes on an informal status because of its perceived incongruous relation with the city. In many instances it does not wait for land managers to make their decisions about several important planning variables such as the "where", "when" and "who". Communities laboriously create their own variety of urban agriculture types: small farms, garden parks, allotments, collective gardens, or community gardens.

[1] See for example : Pierre Donadieu. *Campagnes Urbaines*. Paris: Ecole nationale supérieure du paysage, 1998.

An aerial photo (2002) of the Des Seigneurs Community Garden located in a neighbourhood called Little Burgundy on the corner of rue St-Jacques and rue des Seigneurs. The Garden is south-west of Montreal's downtown area.

Image source: Navigateur Urbain, Ville de Montréal

Elisabeth Pasquier (2001) in her book entitled *Cultiver son Jardin* relates her extended nine year experience in the gardens of *La Fournillère* in Nantes (France) concerning community gardens. Pasquier associates this urban vegetable garden to a place of resistance and describes the particular space in which it appeared. Previously, the garden was in the *faubourg* of the city and followed an evolution linked to urbanisation similar to the other gardens of the area. It was linked physically by the perimeter of the fields which was configured by the contours of roads and construction. The axis on the south side of the garden, Pasquier explains, was the main entrance to Nantes until the 19th century. Between the two World Wars, the space was slated for what she refers to as an oversized four-lane boulevard project, in a mostly residential area. It far exceeded the needs of the size required for the structures present. The project was never realized and the gardens slowly "took root". In 1977, the new mayor permanently abolished the boulevard project and there was a full revision of the land use plan. Then the gardens of *La Fournillère* were recognized as a green space and left to be self-administered by the gardeners until 1999, when the City formally intervened to manage and appropriately landscape the area according to the national norms for family gardens (*jardins familiaux previously called jardins ouvriers*) in France.

In this particular section, based on Sach's and Silk's initial comment regarding the quality of urban agriculture as a local development strategy and Pasquier's experience in Nantes, I have tried to reconstruct the narrative surrounding community gardens in Montreal. I have chosen one garden as an example to re-establish the history of a community garden in spatial terms. My premise is that these micro spaces are often ignored in land use management terms and that their formation is also misinterpreted. To better understand the garden's narrative, maps from different decades of the area where the garden is presently located were compiled, analysed and interpreted. This text is the narration of interstitial urban space through the maps found in different libraries in the City of Montreal. It relates the creation of a space, key to the appearance of the Des Seigneurs community garden, a tangible practice of sustainable development.

The first map with which I start my narrative is from the 1912 Atlas of the City of Montréal and Vicinity printed by Chas. E. Goad Company. It shows cadastral numbers, buildings and lots on a scale of 100 feet to an inch. In Plate 10 shown on page 125, there is the detail of the block where the Des Seigneurs community garden will appear some 63 years later. In 1912, it is part of a tightly knit urban fabric. At the time it is delimited on the west by Chatham Street; on the South by St-James Street; on the East by Seigneurs Street; and on the North by Larin Avenue. The block is approximately 76 meters (250 feet) long by 61 meters (200 feet) wide. A small 15 meter alleyway divides the northern part of the block in half up to the center. One main train line called the Grand Trunk Railway runs through this part of St-Joseph's Ward, and passes parallel to St-James Street. In the surrounding area the map shows an orphan asylum, a mission, a French Protestant church, a Calvin Presbyterian church, fire station no.12, police station no. 8 and St-Joseph's church & school.

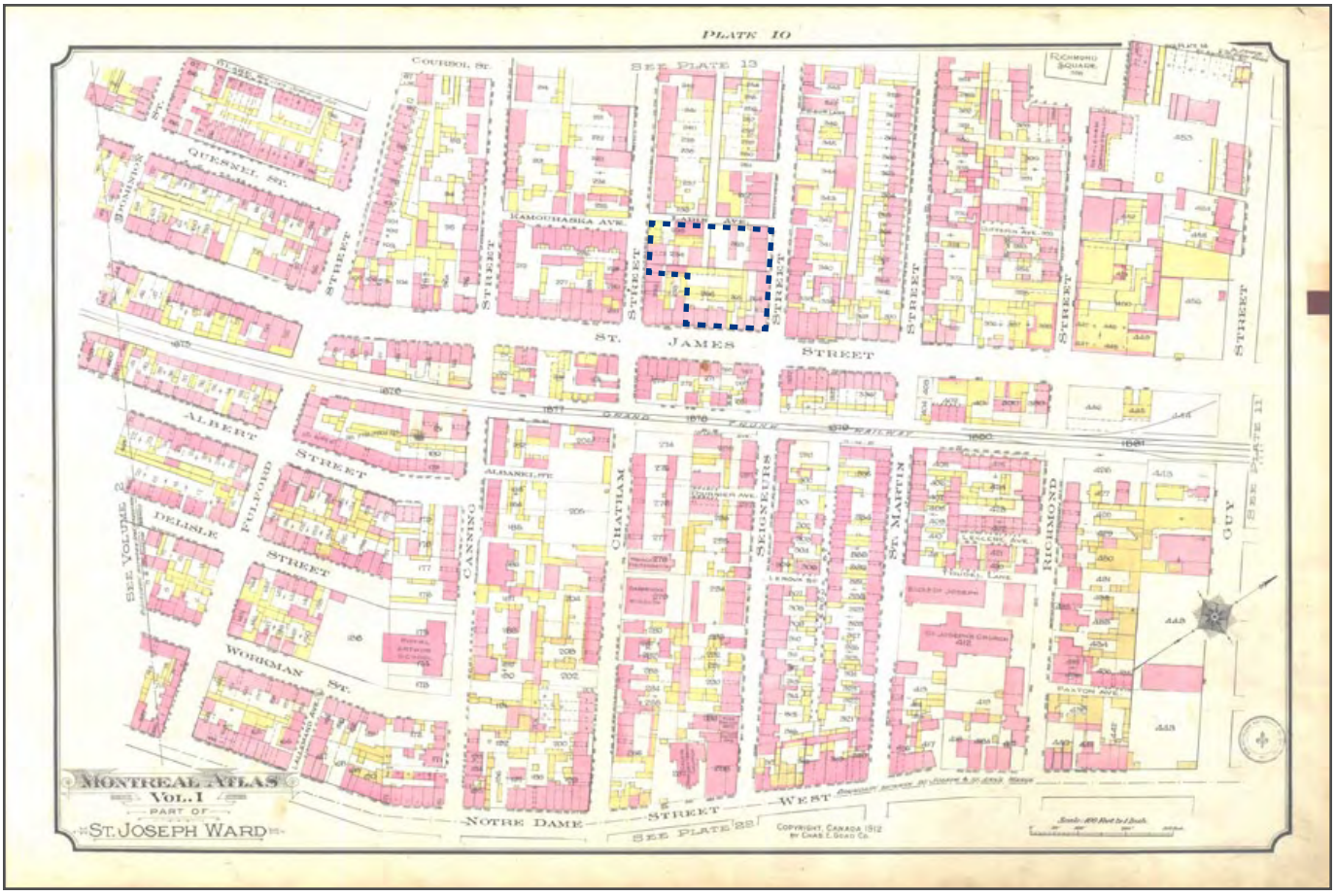
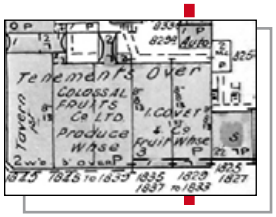
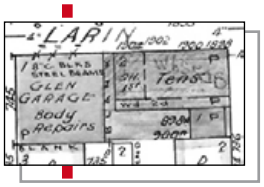
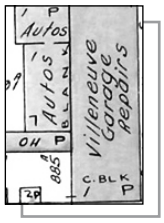


Plate 10 – Vol. 1 of the City of Montréal Atlas illustrating the layout of the street block in 1912. Yellow indicates semi-permanent structures and pink permanent structures. The numbers represent lot records.

Image source: City of Montreal Atlas, Biblithèque et Archives nationales







Moving forward 42 years and looking at a section of the Insurance plan of the City of Montréal printed in 1954 more details appear than in the 1912 Goad Atlas. Over this period of time the very closely knit urban fabric has been well maintained. The block accommodates Glen's Garage and Body Repairs, Taylor Garage Trucking and Company, Villeneuve Garage Repairs and an Electric Motor repairs shop, as well as multiple stores with tenements above them. The rest was residential. Clearly, the area is teeming with businesses.

Across the street from block 398A (see photo on page 127), towards the eastern side, there is a tavern and Colossal Fruits Company produce warehouse with tenements above. A little further north is the Hushvon Public Bath with as noted on the map wooden *louvres*. Across the street on the northern side of the block are located the Siegel Distributing Company -- exclusive Wurlitzer distributor with show room and the Easton Cartage Company. On the North-western side appears the Canadian Baggage Delivery Office and another garage. At this point in time, the plan only notes one vacant store across the street to the west. No sidewalks are marked anywhere on the map, but there is a fire hydrant on the south-eastern end of the block.

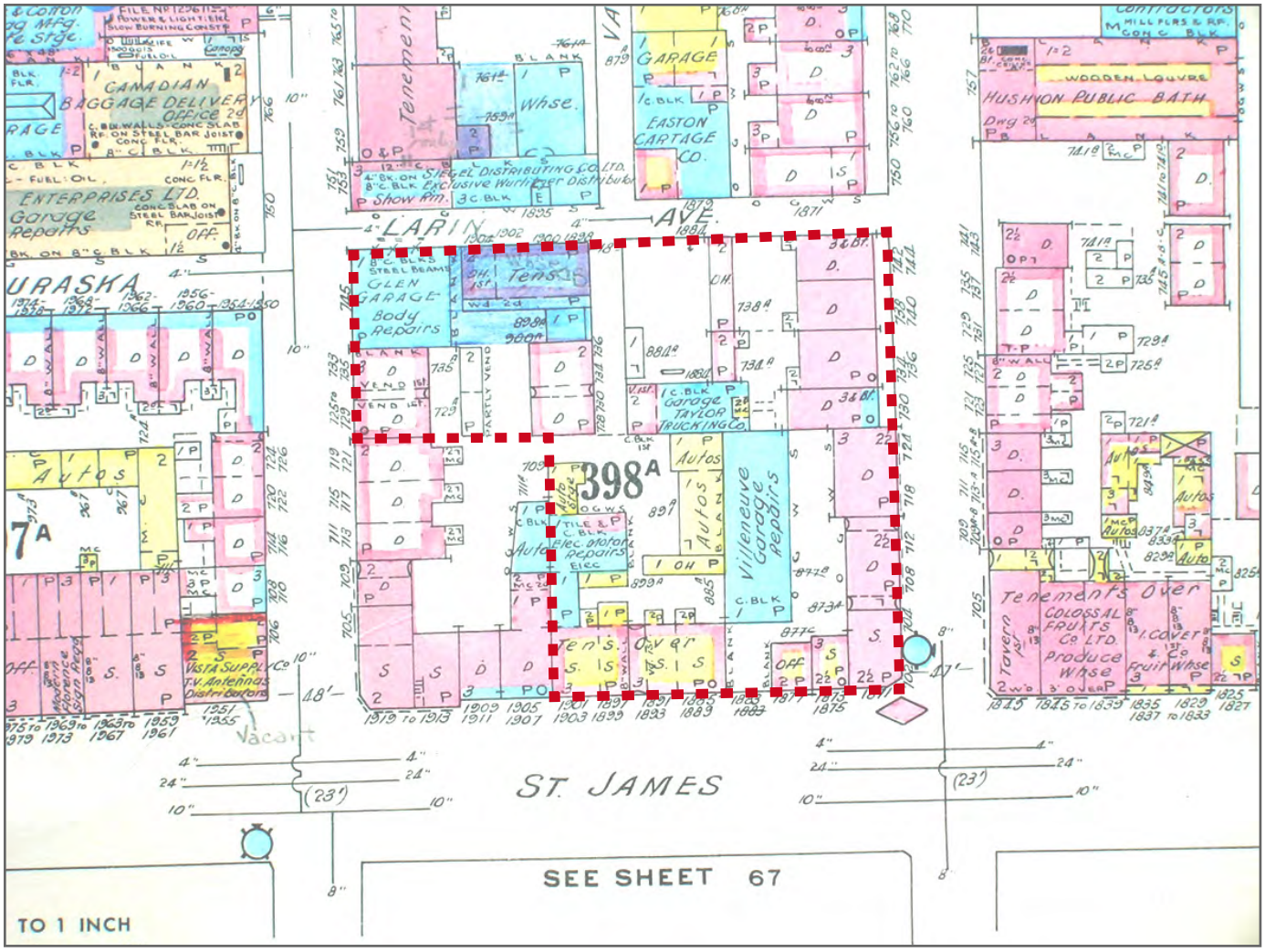


Photo of a fire insurance plan plate (1954).

Image source: Insurance plan of the City of Montreal, Canadian Centre for Architecture

Twelve years later, in 1966, the blocks on the southern part of St-James Street gave way to the enlarged "Grand Trunk Railway". The block observed is now called number 51. St-Joseph's ward is now part of an area designated as "*La Petite Bourgogne*" or "Little Burgundy" in a preliminary urban renewal scheme (1966). The block was part of a neighbourhood which qualified as an area fit for urban renewal under the National Housing Act according to the council of the City of Montreal and the Government of the Province of Quebec. In a detailed study of the physical, social and economic aspects of the area it was noted that Block 51 was home to 125 people. Most homes were multifamily dwellings built sometime between 1850 and 1875, making them nearly one hundred years old. Exactly, 51.68% of block 51 was built, 48.52% was vacant land. Of the built area 87.13% was occupied with residences, 9.97% was non-residential and so forth. In short, a very precise compilation of data for the area was prepared.

There was a mixed commercial, industrial and residential use distributed in an irregular form across the neighbourhood. This scheme which had existed for many decades was now to be improved by dividing the area in two functional districts, one industrial and another residential. Planners had a more homogenized vision of the area: railroad tracks were to be removed, an increased number of well structured green spaces and open spaces were to be implemented and a clear indication of the functions of each type of use was to be instigated. In their study they concluded "empirically": " (…)the future population will be of the same size as the present one. Its social stratification among the working class will be similar, but with a higher social ranking because newcomers will represent 65% of the future population according to our estimates" (Planning Department of the City of Montreal, 55). The entire area was marked for expropriation and destruction to make place for the new plan.

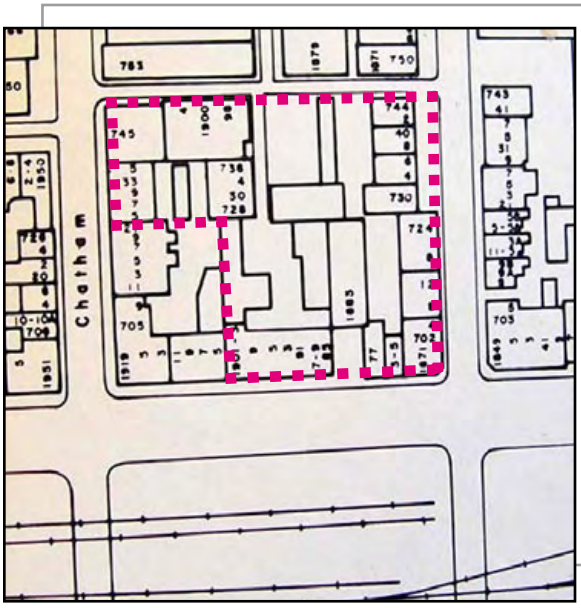


Photo of a section of the *Existing Development* map included in the Urban Renewal Programme (1966).

Image source: Planning Department of the City of Montreal. Georges-Vanier Municipal Library.

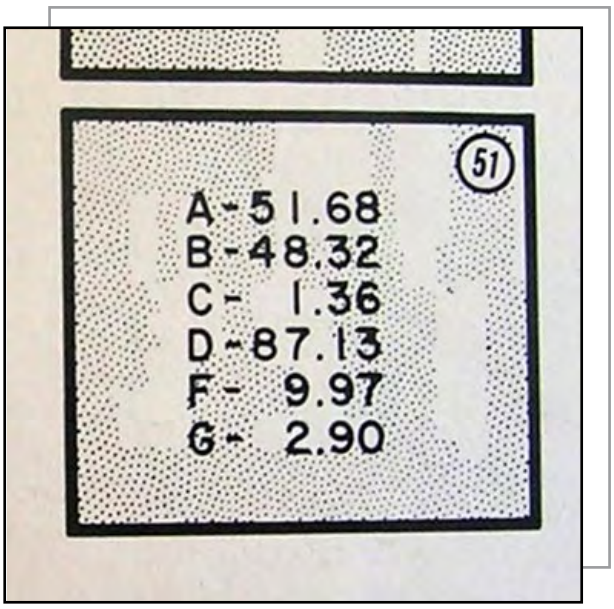


Photo of a section of the *Land Coverage* map included in the Urban Renewal Programme (1966).

Image source: Planning Department of the City of Montreal. Georges-Vanier Municipal Library.

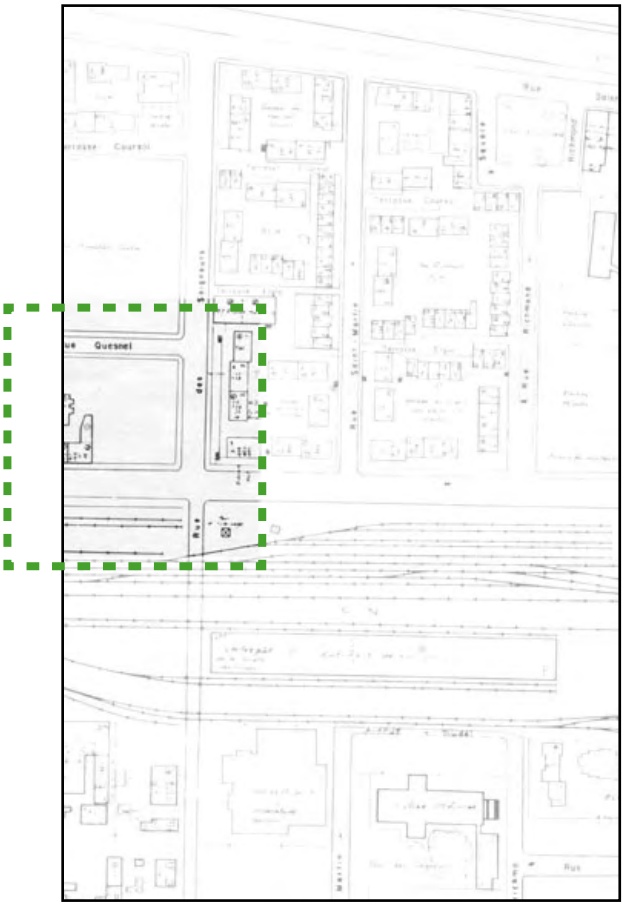
Photo of a section of the *Conserved Buildings* map in the Urban Renewal Programme (1966). Buildings in black are residences to be conserved.

Image source: Planning Department of the City of MontrealGeorges-Vanier Municipal Library.

By 1975 the cadastral map of block 51 showed the result of what planners had described in 1966 as a "systematic yet progressive improvement of the social, physical economic conditions of the area" (Planning Department of the City of Montreal, 69). The industrial sector was relegated to the southern area of the neighbourhood and the northern area became strictly residential. Campbell Park appeared North of the block 51. East of the block a new medium rise housing project had been built as planned and most of the urban renewal programme according to the cadastral map had been executed per the recommendations made in the study. Nevertheless, somehow plans for block 51 had fallen through. Part of the block was expropriated and raised, but nothing was built. A vacant unplanned space remained.

It is only in the 1979 version of the cadastral map that we notice penciled in Block 51 *Jardin Communautaire de la Petite Bourgogne*, although the garden appeared in late 1974. In an article of the Montreal Gazette written by Stan Oziewicz (1974), a local resident, Mrs. Dixon, a mother of six, relates that she can't ever remember anything like this in all the 18 years she's lived in the area. She think it's a great idea to have such a community experience. It is with the help of Tom Wood a biology student at Sir George William University (now Concordia University), and the reluctant cooperation of the City that this garden appeared on a city owned lot. At the time the municipal *Office d'embellissement* was supporting every initiative imaginable to beautify Montreal, and multiple gardens appeared in the city's abandoned nooks & crannies with the help of the Parks division. This is the decade during which high inflation rates caused the federal Agriculture minister Gene Whelan to publish a letter in local newspapers explaining the rise in food prices. At the same time some of Montreal's cooperatives were advertising the possibility of taking a bus off the island to garden[2].

[2] Refer to articles in the *Guide du Plateau Mont-Royal* newspaper from 1974 to 1976.



Scan of a section of a 1975 land use plan.

Image source: Ville de Montréal. McGill University Library.

Scan of a section of a 1979 land use plan.

Image source: Ville de Montréal. McGill University Library.

Today the garden is part of a city-run leisure programme and is no longer promoted as a beautification measure. While there is no preoccupation of food price inflation like in 1975, the gardens are still very popular with long waiting lists in central Montreal boroughs. The community garden know as *La petite Bourgogne* is now named after the street where it is located, Des Seigneurs.

The maps of the block where that garden now grows record a crowded part of St-Joseph's parish, the appearance of an increasing number of railway tracks, the urban renewal of a section of Little Burgundy, a vacant lot and finally the development of a community garden. In summary, the block observed has gone from housing tenements to growing vegetables.

The history narrated allows to better understand in what circumstances this space appeared. Knowing how this space was formed creates a clearer picture of what Henri Lefebvre refers to as the production of space. This may not complete the definition of sustainable development or critique it, but it creates a clearer image of a landscape which contributes to the idea of sustainable development. It demonstrates the transformation of an area, as well as the unplanned and informal solution started by local citizen initiative.

The narrative reveals how a vacant lot came to be and what local solution took root in that space. The situation in Little Burgundy is very similar to the personal experience published by Elisabeth Pasquier. It speaks of formal plans that were not applied in as precise a manner as they were designed. Presently, the community garden is now a space which results from a small achievement which creates, as Ignacy Sachs underlined in his report on food and sustainable development, a direct link between action and outcome while retaining the benefits in the hands of the community.

Photo of the Des Seigneurs community garden.

Photographer: Edward Johnson Martin

Part 3: Des Seigneurs Community Garden History -- Works Cited

Sachs, Ignacy and Dana Silk. 1990. "Food and Energy - Strategies for Sustainable Development." http://www.unu.edu/Unupress/unupbooks/80757e/80757E05.htm#5%20Urban%20Agriculture Tokyo: United Nations University Press. [Accessed: 26 September 2006.]

Pasquier, Elisabeth. *Cultiver Son Jardin*. Paris: L'Harmattan, 2001.

Planning Department of the City of Montreal. *La Petite Bourgogne Urban Renewal Programme: General Report.* Montreal: September 1966.

Oziewicz, Stan. "Inner City gardeners still wait for topsoil." *The Gazette.* 10 June, 1974.

Map and Image Sources:

Present day photos of the garden by Edward J. Martin.

Chas. E. Goad Co. *Atlas of the City of Montreal and vicinity [document cartographique] : in four volumes, from official plans - special surveys showing cadastral numbers, buildings & lots*. Montreal : Chas. E. Goad, Co., civil engineers, 1912-1914. http://bibnum2.banq.qc.ca/bna/cargeo/high/trap0013_n.jpg [Accessed: August 18, 2006]

Planning Department of the City of Montreal. *La Petite Bourgogne Urban Renewal Programme: General Report.* Montreal: September 1966.

Underwriters' Survey Bureau. *Insurance plan of the city of Montréal*. Toronto : Underwriters' Survey Bureau, [1952-1959]

Ville de Montréal. *Land Use Plans* 1/1000 Map Number 31H05-010-3935. Montréal: Ville de Montréal 1975 and 1979.

Ville de Montréal. *Navigateur Urbain*. http://www.navurb.com [Accessed: August 10, 2006]

Conclusion

Sustainable cities is now a new category in the larger typology of global cities, cultural cities and cyber cities. Jacques Véron in his book *L'urbanisation du monde* considers *La ville durable: une ville réhumanisée*. In a sustainable city, he writes, the neighbourhood is organised around a center and is accessible by foot. Residents can also get to the center by public transit. Collective infrastructures are available to satisfy the needs of every age bracket and intergenerational relations allow for a social mixité. After describing the sustainable city, Véron ponders whether he is not simply describing the "ideal city."

Véron's reading of an ideal urban condition is not unanimous. It is likely that Robert Bruegmann would contest Véron's version of the "ideal" for trying to apply nineteenth century city models to contemporary cities. In *Cities Architecture and Society*, a publication accompanying the 2006 architecture biennale in Venice, Bruegmann suggests that the next ideal city remains undiscovered, and argues that it is more likely to develop through a progressive outlook rather than freezing our processes to turn back towards systems that reflected an entirely different set of urban conditions.

Bruegmann and Véron's conflicting ideas on the city illustrate a recurring polemic associated with sustainable development. In other terms: Should the sustainable city be seen as a end goal or as an evolving programme?

According to our understanding, the term sustainable development most often implies an improvement by the reduction of existing negative effects on the physical world. Most importantly, it is the very opposite of the theory of improvement of life by reduced activity, as in the reduction of the Gross National Product (GNP). It does not question the capitalist model, nor does it truly put economic growth up for discussion. However, it does bring environmental and social dimensions into the development debate. For example, less pollution through the use of renewable energy vs. non-renewable energy production; manufacturing processes using less materials and energy to produce their products; re-orienting consumption to locally produced food production and purchases; when considering plans for a regional development project, taking the opportunity to include replacing a sewer line to connect it to a filtration plant rather than dumping the sewage in a river. The term "sustainable development" encompasses all of the above and more. Therefore it behooves the user to explain the definition/interpretation of the within the particular context in which it is being used.

Intensification for growth, a priority to a pedestrian perspective, and *urbanisme végétal* may all be part of a sustainable Montréal. None of these themes were thought of as solutions unto themselves. The very notion of sustainable development necessarily implies solutions and views which reach beyond boundaries of single viewpoints, disciplines, categories, and even scales. In the end, the necessary vagueness of the term sustainable development is its strength, as this is what allows it to breach these boundaries.

Conclusion: Works Cited

Cities Architecture and Society. La Biennale di Venezia, 10 Mostra Internazionale di Architettura [10th International Architecture Exhibition] ed. Claudio D'Amato Guerrieri, Rinio Bruttomesso, Pio Baldi. Venezia: Marsilio, 2006.

Véron, Jacques. *L'urbanisation du Monde*. Paris: Editions La Découverte, 2006.

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