

M KNOWLEDGE_{city} N T R É A L



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FOREWORD

During the Montréal Summit held in June 2002, there was strong consensus around the need to position Montréal as a knowledge city on the international scene.

In the wake of that meeting, the City of Montréal — acting on a suggestion by the rector of Université de Montréal and the head of the Education, Health and Research delegation to the Summit, Robert Lacroix — set up, in partnership with Montréal International and the Conseil régional de développement de l'île de Montréal (CRDIM), an Advisory Committee responsible for reporting on the situation and recommending avenues for future action.

The Committee has chosen to undertake its work in keeping with the introduction of a new administrative structure for the metropolis, the increasingly important role of metropolitan areas as global centres for economic and cultural development, and the intensification of competition among cities around the world.

In performing their mission, the members of the Committee paid particular attention to:

- Documenting the conditions for success of knowledge cities and knowledge-based economies;
- Identifying Montréal's biggest challenges in positioning itself as a knowledge city;
- Surveying 100 Montrealers of the emerging generation working in knowledge-intensive industries to find out their expectations toward a city;
- Analyzing, on a worldwide scale, the practices of metropolitan areas recognized as successful knowledge cities.

Based on the results of these analyses and the Committee's own thinking, this report is organized into three major sections:

SECTION I: ESTABLISHING MONTRÉAL AS A KNOWLEDGE CITY

This section provides a definition of a knowledge city and describes Montréal's strengths and weaknesses on this front in comparison to other North American cities.

SECTION II: KNOWLEDGE CITIES: AN OVERVIEW

This section of the report examines the practices of cities that are recognized as successful knowledge cities, and the strategies they have mapped out in support of their positioning.

SECTION III: SPEEDING MONTRÉAL'S TRANSFORMATION

In this section, the Committee describes the key priorities that Montréal should adopt in order to best exploit its potential as a knowledge city, and recommends a number of short-term concrete actions as well as longer-term structure-enhancing initiatives that leaders of the Montréal community could develop in pursuit of that objective.

Throughout the duration of their work, the Committee members were struck by the affection and the confidence that Montrealers feel about their city, particularly talented young people living in Montréal and those living abroad, in places like Paris, Silicon Valley, London and Singapore. These are people who are ready to take concrete action in favour of Montréal so that it may fully realize its potential as a knowledge city.

The Committee was also able to see that Montréal's unique identity is an invaluable asset that must be fully leveraged when the time comes to implement projects of a mobilizing nature.

Lastly, the Committee firmly hopes that everyone involved in Montréal's development will find this document helpful and a source of concrete guidelines for the establishment of a true knowledge culture in which all Montrealers can share.

Pierre Laferrière, Chair
Pascale Michaud, Vice-Chair and Research Director
Montréal, Knowledge City Advisory Committee

MONTRÉAL, KNOWLEDGE CITY

Report of the *Montréal, Knowledge City* Advisory Committee

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OVERVIEW

Although Montréal can be justifiably proud of its rich industrial history, like other major cities in developed countries it has experienced profound changes in recent decades. As many manufacturing and industrial operations have gradually been shifted to countries that offer cheap labour, the major urban centres in developed countries have invested increasingly in leading-edge sectors that are driven by innovative, knowledge-based activities.

The development of new areas of expertise — in the field of biomedicine, for example — is paving the way for a unique dynamics of innovation, the establishment of novel research and development infrastructures, and the formation of multidisciplinary communities of specialists around the world working together intensely on developing high-value-added fields of knowledge.

This knowledge explosion is encouraging a strong culture of creativity. For a city to be capable of attracting, keeping and integrating talented people working in the new knowledge economy, it needs to offer more than a high concentration of scientific and technological activity; it requires a climate conducive to the production and dissemination of new ideas.

For a knowledge city to succeed in the 21st century, it must also build on its uniqueness, its openness to diversity, and on the easy access it offers to the artistic and cultural activities highly appreciated by those working in knowledge-intensive fields.

ESTABLISHING MONTRÉAL AS A KNOWLEDGE CITY

Understanding what a knowledge city is

A knowledge city is notable primarily for the wealth of its acquired knowledge, which essentially revolves around its learning institutions, research centres, businesses and creators.

It is also distinguished by the pace of assimilation and use of new types of knowledge, and by their dissemination and sharing, the promotion of which in turn ensures that these new knowledge types rapidly acquire economic and social value.

The intensity of knowledge in a city is measured not only by the number and quality of the organizations and institutions that take root there, but also by the competence of the knowledge workers and the dynamics of their inter-relationships. It therefore becomes essential for the skilled people any city needs to make an impact in the new economy to feel at home: to inhabit close-knit networks in which people and organizations share common problem-solving concerns and similar goals, and thus engender new types of knowledge.

A true knowledge-based city also abounds with different types of networking and innovation models based on a physical concentration of R&D activity, on access to venture capital, and on communities of expertise capable of driving the innovation process, from the idea-generation stage through to the commercialization of new products and services.

If it is to maintain a high intensity of knowledge, such a city must be able to provide an appealing urban environment that will attract and keep knowledge workers, a culture that encourages the creativity needed to promote innovation, high-quality institutions to train knowledge workers, and adequate funding sources to develop major ground-breaking projects.

Positioning Montréal in the knowledge era

A knowledge-based city is therefore characterized by sound economic performance in knowledge-intensive sectors, the quality of its innovation process, the availability and the skill level of its human capital, and the richness of its cultural and social assets.

From these standpoints, Montréal clearly enjoys solid foundations to support its positioning as a knowledge city. But it also has major challenges to overcome if it is to protect and strengthen that positioning.

Montréal does possess the requisite concentration of high-knowledge industry segments and professions, a reasonably strong number of high-technology fields (including aeronautics and biopharmaceuticals), and a significant core of creators in the cutting-edge arts and culture fields. It also offers the kind of pleasant, motivating lifestyle environment valued by workers in the knowledge economy. Its overall employment pool, however, remains too limited because of a deficiency in the growth, both in number and in size, of high-knowledge firms. And it still does not do enough to promote the quality of its assets and to leverage its networks.

To position itself more clearly in the knowledge era, our metropolis must move quickly on a number of critical fronts: the innovation process, the development of human capital, the retention of qualified immigrants, and the promotion of its many knowledge institutions and networks.

Harnessing Montréal's vital forces

Montréal clearly merits inclusion in the global network of knowledge-based cities, in particular because of the interdisciplinarity, synergy and decompartmentalization increasingly pursued by its universities and cultural institutions, and a growing number of organizations active in myriad industry segments.

To make a more definite impact in the knowledge-based economy, Montréal would do well to draw attention, in a distinctive manner, to its unique assets. These include the neurosciences sector with its rich tradition of innovation, its quality of life, and its geographical and cultural position as a bridge between Europe and North America.

Conversely, many of the hundred-odd knowledge workers working in the Montréal metropolitan region and abroad who were consulted by the Committee believe that, to make the metropolis more attractive in their eyes, authorities must act to remedy Montréal's most notable weaknesses, which they identify as oppressive taxation, the poor quality of some infrastructures, and the limited pool of high-knowledge-based jobs.

KNOWLEDGE CITIES: AN OVERVIEW

Identifying success factors for cities

In recent years, many cities around the world have embarked on initiatives that involve discussions, collaborative efforts and establishment of strategies aimed at honing their competitive edge on the national, continental and international scales. In some cases these initiatives have led to remarkable successes — witness the experience of cities like Dublin, Barcelona, Lyon, Singapore, and Austin, Texas.

These urban centres have been able to position themselves as poles of knowledge by combining traditional (i.e., infrastructure-based) investment with new modes of capitalization (a compelling mix of arts-, science- and technology-based projects), in varying proportions depending on the city.

The Committee has observed that these success stories share a number of points in common: the sense that some sort of change was urgently needed to propel the city as a top knowledge city; the frontline role assumed by local public- and private-sector players; the exploiting of targeted development sectors; consistency in the implementation of strategies in these sectors; the investing of considerable sums of money; the sustained pursuit of goals to ensure results are achieved; and the deployment of efforts to ensure that day-to-day existence in these transformed cities is efficient and pleasant for knowledge workers.

A focus on structure-enhancing ideas in various fields

By analyzing the initiatives taken by successful knowledge cities, one can pinpoint a number of practices notable both by their simplicity and by their potential for value creation. The Committee has identified the following, among others: building of effective metropolitan Web sites; creation of "microcosms of creativity" in downtown cores; establishment of innovative voice-mechanisms for ongoing societal dialogue; and alliances among knowledge-based cities to rapidly and continuously share best practices.

The top-ranking knowledge cities (measured using a variety of indicators) have all created effective metropolitan Web sites that respond in an integrated way to knowledge workers' needs and expectations in their search for information and in their desire to assimilate into different communities.

Moreover, many cities have instituted what one might term "microcosms of creativity," in the form of districts that are home to various players in high-knowledge industries, such as bio-sciences and communications technologies, and other fields that show promise, and which blend in naturally with the city's attributes.

More and more cities are also establishing permanent participatory bodies within which elected officials, local authorities and citizens' groups can pursue ongoing dialogue on knowledge-related issues at stake in their municipalities.

Lastly, many cities of similar size and sharing similar aspirations have come together to form networks, whereby they share data on cities' competitiveness, analyze trends in economic models and transformation of cities, and draft public policy documents aimed at advancing key agendas.

"Failure factors" must not be ignored

Often, cities are unable to successfully assert themselves in the knowledge age, despite deploying considerable efforts to this end. One example is Pittsburgh, where, notwithstanding massive investments in such areas as transport infrastructures and sports stadiums, insufficient attention has been paid to the needs and expectations of workers in knowledge-based industries, for instance in terms of quality of life and arts and cultural attractions.

Similarly, the city of Baltimore has chosen to invest massively in tourism-related facilities, while failing to ascribe sufficient value to one of the jewels in its crown: the Johns Hopkins Hospital and Health System, one of the most prestigious of U.S. institutions.

SPEEDING MONTRÉAL'S TRANSFORMATION

Establishing priorities

Obviously, in the current age of knowledge and globalization, Montréal is in direct competition with metropolises all over the world. Safeguarding and strengthening Montréal's status as a knowledge city hinges on maintaining the proper focus on its distinctive assets, and immediately introducing measures designed to remedy its main weaknesses in terms of innovation, human capital development and immigration, so that avenues for concrete action may be mapped out.

These priority areas, as identified by the Committee, are clearly in keeping with many of the recommendations that emerged from the Montréal Summit.

To reinforce the process of innovation, the Committee believes Montréal must work harder to create the best possible conditions for stimulating entrepreneurship, by ascribing value to, and rewarding, creativity. The changes necessary have to do with the organizational competencies of start-up companies; the expansion of private equity markets in support of the initial stages of R&D and the mass-marketing of new high-knowledge products and services; and the ability of local investors to gauge market potentials at a time when new high-knowledge products and services are more complex than ever before.

If it is to enhance development of its human capital, Montréal should strive to create conditions conducive to the building and dissemination of a learning culture — at all levels where it is possible to do so. This must necessarily include efforts aimed at curtailing the critical problem of high-school dropout rates, and promoting a significant decompartmentalization between educational institutions (universities, junior colleges and others) and between the academic and labour communities in order to allow all Montrealers to expand their horizons of knowledge and creativity.

The Committee also believes that, to succeed in attracting and retaining a qualified immigrant workforce, Montréal should prioritize the creation of “welcoming” projects and initiatives, especially among leaders from its high-knowledge industries. It should also put the power of its local and international networks to better use to draw attention to Montréal’s attractions as a place for foreign knowledge workers to work and live.

Moreover, Montréal must actively and resolutely highlight the exceptional knowledge assets and networks of expertise that it already possesses — its universities, research centres, and numerous institutions and laboratories devoted to creativity. In this regard, it is vital to focus on sectors of excellence in which Montréal already stands apart, in order to draw even more attention to them.

Ensuring that conditions for success are in place

The Committee is of the opinion that three key conditions must be fulfilled if we are to ensure Montréal’s ascendancy as a knowledge city.

The first of these is deployment of explicit leadership at the local level, shared among the city administration, the private sector, and various associations. It is exactly this type of synergy that played a determining role in the emergence of Austin, Texas, as a knowledge city.

The second condition involves ensuring that immediate attention is paid to fundamental issues at stake in the areas of education, immigration and innovation. In this area, Montréal must adhere to a distinctive pace and dynamics of change that is in keeping with its status as a metropolis.

Third, the active participation of the citizenry is an essential condition for success, and one that has proven its worth in other knowledge cities that are thriving on the world stage. It is also a key asset most highly valued by workers in the knowledge economy, who wish to play an integral part in the development of their metropolis and its emergence as a distinctive knowledge city.

In conclusion

The members of the Committee are convinced that, to position itself effectively and in a sustainable manner as a knowledge city, Montréal must be able to rely above all on its municipal administration to assume a crucial leadership role. Citizens, especially, expect their administration to show leadership, vision and drive in defending, before higher levels of government, metropolitan agendas that are vital for a knowledge-based city.

Cities all over the planet are seeking to attract and retain talented individuals and knowledge-based activities. They all wish to maximize their knowledge flow and excel in new, high-growth areas like bio-sciences.

Given this context, Montréal possesses extraordinary assets that put it in a position to make its mark in the knowledge age.

That is why, from this moment on, Montréal must vigorously pursue its mission of being a true knowledge city.

INTRODUCTION

“Knowledge is perhaps the most critical competitiveness factor. As countries move up the economic scale, the more they thrive on knowledge to ensure their prosperity and to compete in world markets.”
Stephane Garelli, Director of World Competitiveness Project, IMD

INTRODUCTION

Although Montréal can be justifiably proud of its rich industrial history, like other major cities in developed countries it has experienced profound changes in recent decades.

As many manufacturing and industrial operations have gradually been shifted to industrializing countries where labour is more affordable, the major urban centres in developed countries have invested increasingly in leading-edge services and novel ground-breaking economic sectors.¹ The latter are conducive to new modes of knowledge production and dissemination and forms of value creation.

The development of radically new areas of expertise — in the field of biomedicine, for example — is paving the way for a unique dynamics of innovation, the establishment of research and development infrastructures, and the formation of multidisciplinary communities of specialists around the world working together intensely on developing high-value-added fields of knowledge.

This means that at present, a huge swath of the economy is showing strong growth and, in turn, considerable potential for future development. Growth in the leading-edge services and novel ground-breaking sectors is at the heart of the knowledge-based economy. These areas of economic activity have enormous potential for value creation, and offer virtually limitless possibilities for development of new products and services.

1. Examples of leading-edge services include advanced business solutions for enterprises. Novel ground-breaking sectors relate to new forms of economic activity combining bioscience, communications and information technologies and, in some cases, the arts.

Montréal has a stake in the new knowledge-based economy.

Investments in the Montréal university community exemplify the changes under way.

Recent investments



Université de Montréal and its affiliated engineering school École Polytechnique will soon be inaugurating a new building dedicated to research in the pharmaceutical sector, biotechnology, aeronautics and aerospace, novel materials, and biomedical technologies.

This structure will foster interaction of expertise and attract research fellows from all over the world. This investment significantly enhances Montréal's potential as a key centre for research into next-generation products and services.



Construction is nearly complete on a new Concordia University building on Ste-Catherine Street, which will house the Engineering, Computer Science and Visual Arts faculties of the Sir George Williams campus. The new facility will integrate leading-edge technologies and arts, in order to promote cross-fertilization of ideas as well as speed product and service innovation in the technological arts, software and other fields.

Montréal has joined the ranks of the world's leading research centres in genomics and proteomics with the inauguration of the McGill University and Genome Québec Innovation Centre. The centre will house researchers from both McGill and Université de Montréal, their affiliated teaching hospitals, and international institutions.



The Cognitive Neuroscience Centre, a UQAM research centre, is world-renowned for the scope, diversity and scientific value of its work on the foundations of cognition and the mapping of the human brain. Research conducted here encompasses several disciplines, including medical sciences, psychology, information systems, philosophy and linguistics.

Source: Web sites of Montréal universities.

The knowledge-based economy operates parallel to the traditional economy, and in some cases interfaces directly with it — making it possible to develop improved products and services (e.g., nanostructured materials have applications in electronics and in clothing manufacturing). It is also ushering in a period of profound socioeconomic change. For instance, today it is common to see small, cottage-industry enterprises and self-employed workers driving the economy rather than operating on its fringes; moreover, these players exert considerable influence on types of value creation, working methods, and forms of leisure. The knowledge-based economy has also given rise to new organizational structures — which, in contrast with the pattern of traditional hierarchical systems, promote the sharing of expertise (as exemplified by the open-source movement in software development).

Interpenetration of innovation across industry segments is not a new phenomenon. For example, even a highly traditional industry such as winemaking benefits constantly from the use of innovative types of knowledge (such as harnessing the latest-generation satellite technology to forecast the quality of grape harvests). But what truly differentiates the knowledge-based economy of today is the *acceleration* and *intensification* of the production, use and dissemination of new knowledge and new technologies. As Professor Alain Lapointe of HEC Montréal has justly written: “The new economy is characterized by acceleration of the trends that have led us to transform our modes of production and organization [. . .] The knowledge economy is part of a historical evolution phase exemplified [. . .] by the growing influence of knowledge on value creation and [. . .] by rapid, widespread dissemination of new information technologies. These basic trends are in keeping with the wider context of open markets and intensified competition on a global scale.”

As Professor Lapointe remarks, no less astutely: “It would be most unfitting to view the knowledge economy solely in terms of the high-tech sectors. The changes under way affect every single industry segment, to varying degrees.”²

Since the 1970s, Montréal has seen a shift from an industrial to a post-industrial economy.

	Characteristics of an industrial economy	Characteristics of a post-industrial economy
Main engines of regional economic growth	Traditional manufacturing and service sectors	Leading-edge services and novel ground-breaking sectors, which also promote renewal of the classic resource, manufacturing and service sectors
Criteria for differentiating cities	Cost structures (e.g., manufacturing production capacity, transportation cost structure)	Intensified creativity. Emphasis on capacity for development of human capital (e.g., worker mobility across enterprises and industry segments, access to ongoing training, fast knowledge circulation, etc.)
Development of knowledge	Hierarchical, by discipline	Via emerging interdisciplinary networks
Politicians' priority	Attract large corporations	Nurture and attract talented individuals, as well as high-knowledge activities of enterprises and research institutions

2. Lapointe, A. (2003). “La Performance de Montréal dans l'Économie du savoir: un changement de politique s'impose,” *Cahier de recherche HEC* No. IEA-03-03.

The rapid expansion of knowledge throughout the world's advanced societies also generates a strong culture of creativity. In this regard, Montréal enjoys an advantageous position, because of its high concentration of knowledge-based activity, and a climate conducive to the production and dissemination of new ideas.

Prof. Richard Florida, arguably the most influential contemporary specialist on knowledge cities, believes that economic competition criteria for cities in the new economy are largely based on their capacity to attract, retain and integrate talented individuals who place value on creativity. Cities compete on three main fronts³:

- The quality of the local culture (a city's cultural vitality, unique and authentic character, ethnic diversity, and tolerance of social/lifestyle diversity);
- A "thick" labour market (abundant employment and lateral moves opportunities for knowledge workers);
- The presence of local amenities and attractions that are highly valued by knowledge workers (e.g., access to open-air activities, presence of innovative artistic spaces).

For a knowledge city in the 21st century to be able to properly position itself vis-à-vis new fields of knowledge, and at the crossroads of new modes of economic development (e.g., bio-sciences, information and communications technologies), it must also build on its unique character so as to attract and retain knowledge workers, promote exchanges of knowledge, and maintain a climate conducive to creativity and innovation.

In short, when dealt a new hand, one must set clear strategies to stay in the game.

A city's overall attractiveness quotient is crucial for attracting and retaining knowledge workers and stimulating creativity.

Some attributes of a 21st-century knowledge city

- Significant growth in leading-edge service and novel ground-breaking economic sectors.
- Strong dynamics of innovation across all sectors of economic activity and within all institutions.
- Culture of knowledge (knowledge is disseminated and valued) across all sectors.
- "Flow" of information (open circuits, accessible information).
- Pronounced acknowledgement of and support for creative activities.
- Strong link between arts/culture and scientific/technological knowledge and innovation.
- Significant proportion of the labour force working in creative positions.
- Citizenry actively involved in the development of their city, its identity and its unique character.
- Abundance of places and events valued by knowledge workers (e.g., open-air activities, cultural events, vibrant neighbourhoods).

3. Richard Florida, *The Rise of the Creative Class*, Basic Books, 2002

ESTABLISHING MONTRÉAL AS A KNOWLEDGE CITY

1.1 UNDERSTANDING WHAT A KNOWLEDGE CITY IS

1.2 POSITIONING MONTRÉAL IN THE KNOWLEDGE ERA

1.3 HARNESSING MONTRÉAL'S VITAL FORCES

“After considering several cities in the U.S. and Canada, we decided that Montréal offered the best combination of creative talent, technology infrastructure and favorable economics.”

Don Mattrick, President, Electronic Arts Worldwide Studio

1.1 UNDERSTANDING WHAT A KNOWLEDGE CITY IS

Before examining Montréal's positioning as a knowledge city, it is important to first define how a city can aspire to that title. A knowledge city is notable primarily for the intensity and constancy of its dynamics of knowledge creation. Beyond the sheer volume of knowledge produced, a city's capacity to rapidly transform that knowledge capital into innovative products, processes and services is paramount. In this regard, there are three main components that determine the intensity of knowledge in a city: its degree of knowledge production, the pace of assimilation and use of new knowledge types, and the scope of knowledge circulation.

1) Degree of knowledge production

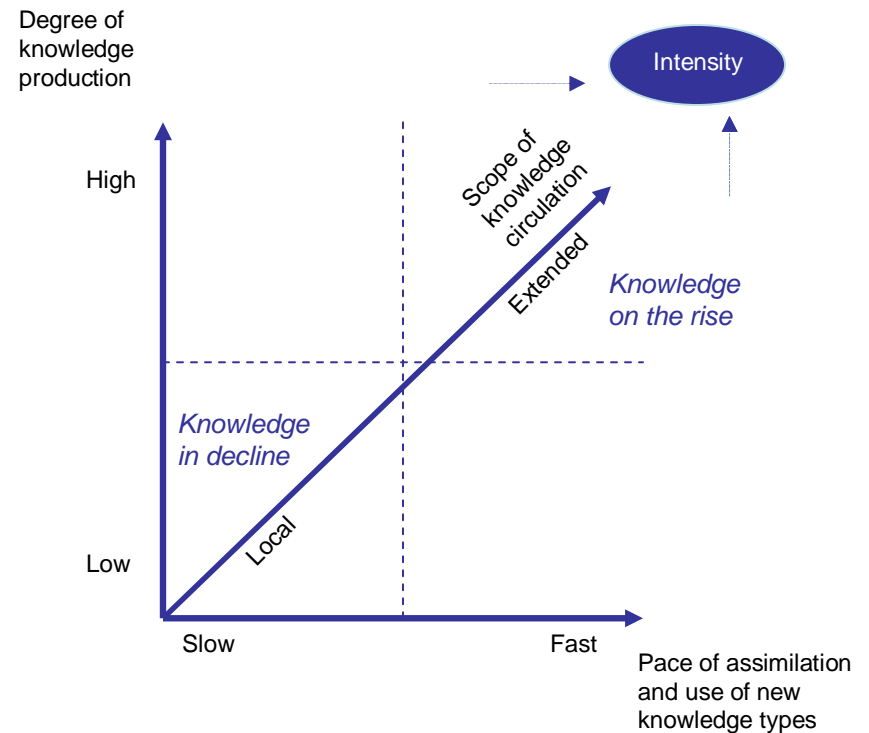
One way in which a city stands apart is by the wealth of its acquired knowledge. Knowledge production proceeds largely from what are known as a city's engines of economic development:

- Its universities (and their affiliated research centres and teaching hospitals);
- Its research centres (both public and private);
- Its business firms; and
- Its creators (artists, fashion designers, and so on).

The dynamics within and across these four pillars is what gives a city its knowledge production and transformation quotient. In essence, the more a significant proportion of the city's labour force is busy creating and inventing new knowledge, products and services in the fields of science, technology and the arts, the greater the city's development of knowledge capital.

A strong "flow" of knowledge in a city is therefore conducive to various types of innovation, be they technological, organizational or institutional. Such a continuous stream of innovation drives, among other things, organizations' competitiveness, high-tech company start-ups, and the emergence of key innovative projects.

A knowledge city is distinguished by *intensity* of knowledge.



$$\text{Degree of knowledge production} \times \text{Pace of knowledge assimilation} \times \text{Scope of knowledge circulation} = \text{Intensity of a knowledge city}$$

Strong knowledge "flow" in a city is conducive to various types of innovations: technological, organizational, institutional. These in turn contribute to enhancement of existing companies and institutions, to high-tech company start-ups, and the emergence of innovative developmental projects — all of which are determinants of a knowledge-based city.

2) Pace of assimilation and use of new knowledge types

It is not enough to simply produce knowledge. One must also have the capacity to extract economic and social wealth from it. In other words, another distinguishing factor for a knowledge city is the ability to consistently reap the benefits of new knowledge types and new expertise, whether “homegrown” or imported.

There are a variety of factors that may influence the pace at which a city assimilates and uses these knowledge types. These include: ease of access to knowledge, understanding of the new knowledge types available, and the ability to integrate them into the activities of organizations likely to extract value from them. This ability is directly related to the competencies of the city’s labour force. It relies upon individuals’ scientific, technological and artistic know-how and talent, but also their capacity to join creative networks of knowledge made up of diverse individuals and institutions.

3) Scope of knowledge circulation

The amount of dissemination and sharing of knowledge — whether among individuals or organizations, across industry segments or geographical regions — is another benchmark for quality in a knowledge city. Knowledge circulation, which is directly related to circulation of individuals, is essential for a city to consistently revisit its perspectives and its “innovation pool”.

Therefore, a city must have the capabilities and will to constantly push the frontiers of knowledge, for that is where great discoveries and promising developments happen. In this way, the city is able to constantly renew its wealth of knowledge, ideas and practices, and assert its position as a knowledge city.

By definition, preserving the status of knowledge city means constantly creating and adapting ideas, concepts, processes and products, and ascribing them economic value.

A tale of two knowledge cities:
The relative decline of Oxford and the swift rise of Boston

Oxford



“Oxfordshire has often been described as a classic city region: a university city at its heart, surrounded by splendid countryside and attractive market towns and villages.”
Dr. Richard Shaw, CEO of Oxfordshire County Council

Boston



“I see this as a city where the energy and ideas from our newest residents will propel us to greater heights. Where a commitment to lifelong learning will create the strongest workforce in the country. And where our schools give our students the knowledge they need to shape Boston for generations to come.”
Thomas Menino, Mayor, Boston

4.27 per 100 residents	Student population	4.37 per 100 residents
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Positioning:
 1. Education and tourism
 2. Engineering
 3. Publishing

Positioning:
 1. Biotechnology, medical sciences and information technology
 2. Education and professional services
 3. Conferences and events in the medical sector (tourism niche)

Source: Publications of the Oxford City Council and BostonFuture Organization; press releases from Oxford University

Human capital and the quality of business firms

Safeguarding the intensity of knowledge in a city requires constant investments in the development of human capital, the attraction of qualified immigrants, the development of new knowledge-based firms, and the attraction of knowledge-based companies from abroad.

There is nothing neutral about these choices. To build what might be termed a “virtuous circle” of knowledge creation and valuation, a city’s economic structure must be such that it promotes industry segments and economic activity with extremely dense creative and innovative content, rather than those offering little added value.

In this regard, however, one must not forget that, within certain segments and activities of the new economy, one sometimes notes mass-production operations that are repetitive and not particularly innovative (assembly-line production of microprocessors is one example). Conversely, though, companies in traditional industry segments are sometimes the source of great innovations.

Therefore, a fundamental distinguishing characteristic of a knowledge city is the creative nature of the city’s economic activities. A knowledge city relies upon individuals who are not only qualified, but also able to demonstrate capacities for creativity, complex problem solving, and leadership in the performance of duties. A knowledge city is distinctive in the strong proportion of creative activity within its key industry segments — such as R&D, engineering and strategic management.

On this matter, in *The Rise of the Creative Class*, economist Richard Florida defines typical knowledge workers as well-educated, with university degrees, and occupying positions that require in-depth knowledge and strong creative abilities. This category of workers is found not only in sectors strongly identified with knowledge (such as information technologies or life sciences) but also in other fields such as the arts, design and architecture.

A city’s pool of knowledge workers is fed by qualified individuals attracted to positions that ascribe value to their creative talents.

U.S. city	Knowledge city ranking	Strength of its creative class	High-tech index	Innovation index
<i>Ranking out of 268 cities</i>				
San Francisco	1	12	1	5
Austin, Texas	2	7	13	6
San Diego	3	30	14	13
Boston	3	6	2	12
Seattle	5	20	3	34
Raleigh-Durham	6	5	16	8
Houston	7	22	19	39
Washington-Baltimore	9	4	5	85
New York	10	25	15	54

The **creative class**, in Richard Florida’s definition, includes employees in information and communications technologies, architecture, engineering, science, education, the arts, and design, as well as in health care, management, finance, legal affairs, and marketing. Cities’ rankings are a reflection of the ratio of the creative class to the overall labour force.

Source: Richard Florida, *The Rise of the Creative Class*, Basic Books, 2002, p. 246 and 328.

Knowledge workers generally are associated with organizations, but also with communities and networks within which individuals share common problem-solving and help create new knowledge. In such a context, it is important to note that intensity of knowledge in a city is measured not only by the list of its organizations and institutions, but also by the dynamics of individuals' inter-relationships.

Despite the fact that modern technology now gives us the ability to communicate in real time over great distances, a number of studies point to the advantages of knowledge workers being in close physical proximity: it creates an atmosphere that promotes the production and dissemination of ideas.

From this perspective, so-called technology clusters play an important role, insofar as they connect universities, research centres, companies, and knowledge workers in a common proximity network. Technology clusters are natural concentrations of people and organizations who have common problem-solving goals, through which they drive the emergence of new knowledge.

Knowledge cities abound with various types of networks and innovation models. All are based on a physical concentration of R&D activities, easy access to venture capital, and on communities of expertise capable of driving the innovation process, from the idea-generation stage through to the mass-commercialization of new products and services.

To sum up: if it is to maintain a high intensity of knowledge, a city must be able to provide an appealing urban environment that will attract and keep knowledge workers, a culture that encourages the creativity needed to promote innovation, high-quality institutions to train knowledge workers, and adequate funding sources to turn major, innovative projects into reality.

ESTABLISHING MONTRÉAL AS A KNOWLEDGE CITY

1.1 UNDERSTANDING WHAT A KNOWLEDGE CITY IS

1.2 POSITIONING MONTRÉAL IN THE KNOWLEDGE ERA

1.3 HARNESSING MONTRÉAL'S VITAL FORCES

1.2 POSITIONING MONTRÉAL IN THE KNOWLEDGE ERA

How does Montréal perform as a knowledge city? Recent studies by specialists in urban economics look at a number of criteria applicable to knowledge cities. There are four key performance indicators: economic performance, the quality of the innovation process, the availability and skill level of human capital, and the richness of a city's cultural and social assets.

With respect to the richness of cultural and social assets, the work of economist Richard Florida again bears mentioning. His studies focus on knowledge workers and their expectations vis-à-vis both the quality of life and the quality of employment a city can offer. His indices of knowledge cities not only gauge concentration of technological activities and awarding of patents, but also assess a city's ethnic diversity and amount of artistic and cultural activity – elements all appealing to knowledge workers.

Building on Prof. Florida's findings, the Committee sought to clarify the expectations of Montréal's knowledge workers, and conducted in the spring and summer of 2003 a series of one-on-one interviews with 100 Montrealers (both native and adoptive) between 20 and 40 years of age and working in knowledge-based sectors both in Montréal and abroad.

The Committee found that in many respects Montréal is well positioned as a knowledge city. It clearly enjoys solid foundations to support that positioning. But it also has major challenges to overcome if it is to protect and strengthen it.

There are four main indicators of knowledge cities' performance, ranging from purely economic criteria to assessment of cultural factors.

Economic performance

Sample indicators:

- Growth of high-technology and high-knowledge sectors
- Employment/unemployment growth rates
- Per capita GDP
- Percentage of labour force employed in high-technology and high-knowledge sectors

Quality of the innovation process

- Patents per capita
- High-tech start-ups per capita
- Access to venture capital

Availability and skill level of human capital

- Rate of increase in number of university graduates
- Demographic growth
- Degree of qualifications of immigrants

Richness of cultural and social assets

- Multi-ethnic character of the city
- Degree of openness to cultural diversity
- Proportion of artists

The rise of knowledge workers

As the work of Richard Florida has shown, a city's creative capital is a powerful predictor of future economic growth. According to his analysis, Montréal enjoys a relatively high ranking as a knowledge city.

In spite of a low number of university graduates per capita, Montréal ranks 13th among North American cities with a population over one million when considering the concentration of technological activities. In terms of arts and culture, Montréal ranks 10th according to Richard Florida's "bobo" (bourgeois-bohemian) index, which measures the concentration of artists in a city (e.g., writers, designers, musicians, actors, painters, sculptors, photographers). According to Prof. Florida, the Bohemian index is one of the finest predictors of concentration of high-technology employment in a region — and, in turn, of the potential for economic growth in that region.

His explanation is simple: creatively talented individuals prefer to live in cities with populations characterized by diversity, tolerance, and openness. Such an atmosphere stimulates cross-fertilization of ideas and practices, and promotes faster flow of knowledge. It is a fundamental aspect of any knowledge city.

The employment base

A knowledge city necessarily possesses a rich employment base capable of attracting and retaining knowledge workers and fostering strong dynamics of innovation.

From this perspective, Montréal has possessed the hallmarks of a knowledge city for several decades now. By the mid-1970s, the aeronautical and pharmaceutical industries were already the first and third biggest employers, respectively, in Montréal's manufacturing industry. However, Montréal's relative decline compared to Toronto during the 1970s and '80s had a negative impact on the metropolis, both in terms of demographics and employment.

Montréal enjoys a favourable ranking among North American knowledge cities in terms of concentration of technological activity, as well as ethnic and cultural diversity.

Ranking of North American metropolitan areas with more than 1 million inhabitants

CMSA/CMA (metropolitan areas)	Population	Talent	Melting pot/ mosaic index	Bohemian index	Tech pole index
New York NY CMSA	18,087,251	9	6	2	5
Los Angeles–Anaheim–Riverside, CA CMSA	14,531,529	27	4	1	3
Chicago–Gary–Lake County, IL–IN–WI CMSA	8,065,633	13	12	19	8
San Francisco–Oakland–San Jose, CA CMSA	6,253,311	3	12	19	8
Philadelphia, PA CMSA	5,899,345	19	25	24	10
Detroit–Ann Arbor, MI CMSA	4,665,236	38	24	20	20
Toronto, ON CMA	4,263,757	24	1	4	15
Boston–Lawrence–Salem, MA–NH CMSA	4,171,643	2	13	12	4
Washington, DC–MD–VA MSA	3,923,574	1	11	5	2
Dallas	3,885,415	11	17	17	7
Houston–Galveston–Brazoria, TX CMSA	3,711,043	14	10	33	18
Montréal, QC CMA	3,326,510	43	7	10	13
Miami–Fort Lauderdale, FL CMSA	3,192,582	40	3	18	33
Atlanta, GA MSA	2,833,511	7	31	15	12
Cleveland–Akron–Lorain, OH CMSA	2,759,823	37	29	39	31
Seattle–Tacoma, WA CMSA	2,559,164	6	19	11	6
San Diego, CA MSA	2,498,016	12	8	16	11
Minneapolis–St. Paul, MN–WI MSA	2,464,124	5	35	9	16
St. Louis, MO–IL MSA	2,444,099	28	41	37	17
Baltimore, MD MSA	2,382,172	18	34	34	22
Pittsburgh–Beaver Valley, PA CMSA	2,242,798	32	38	40	28
Phoenix, AZ MSA	2,122,101	23	20	21	14
Tampa–St. Petersburg–Clearwater, FL MSA	2,067,959	42	22	27	24
Denver–Boulder, CO CMSA	1,848,319	4	27	8	9
Vancouver, BC CMA	1,831,665	31	2	3	29

rank

- Talent index: City's concentration of people over 18 with a bachelor's degree or higher
- Mosaic index: City's concentration of foreign-born individuals
- Bohemian index: City's concentration of people working in cultural and creative occupations — **most consistent predictor of a city's high-tech employment**
- Tech pole index: City's concentration of high-tech industries and high-tech employment

Source: M. Gertler, R. Florida, G. Gates and T. Vinodrai, *Competing on Creativity: Placing Ontario's Cities in North American Context. Report prepared for the Ontario Ministry of Enterprise, Opportunity and Innovation and the Institute for Competitiveness and Prosperity, November 2002.*

In the 1980s and 1990s, the transformation of Montréal's economic structure has been positive overall, in many respects. Montréal benefits from a strong concentration of high-knowledge industry segments and professions.

The concentration of technology in the manufacturing sector has been enhanced, to the point that high-tech firms now account for 17% of this sector in Montréal, in contrast to the 9% level that was the norm in the 1970s (see table on following page). The services sector now makes up 77% of the Montréal economy, placing it on par with the average for major North American cities.

Compared to its population, Montréal rates highly among North American cities in terms of employment in several high-tech fields:

Technology sector employment per capita:

1. San Francisco/Silicon Valley
2. Seattle
3. Boston
4. Montréal
5. Dallas
6. New York

Aerospace sector employment per capita:

1. Seattle
2. Montréal
3. Los Angeles
4. Washington

Biopharmaceutical sector employment per capita:

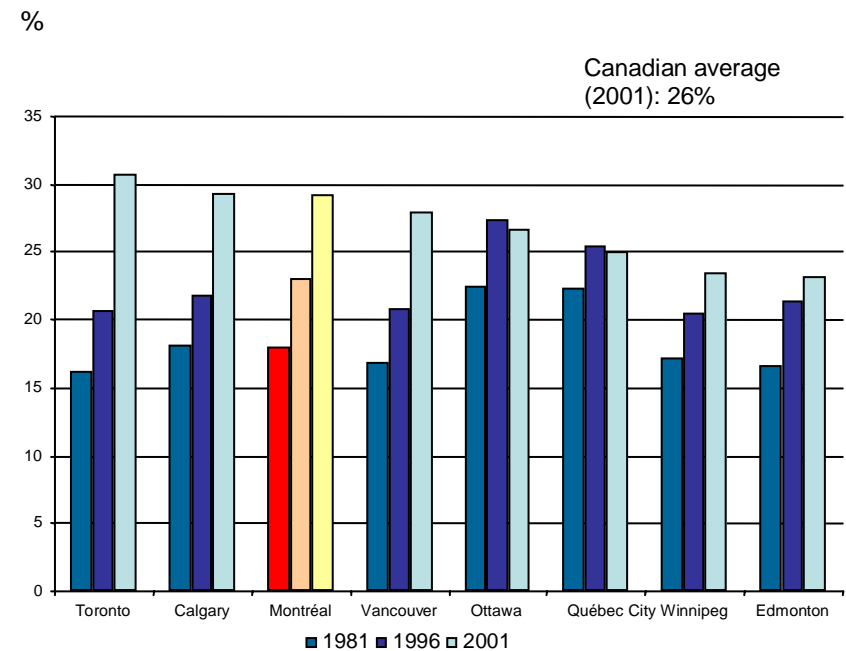
1. Philadelphia
2. New York
3. Montréal
4. San Francisco/Silicon Valley
5. Boston

Information and communications technology sector employment per capita:

1. San Francisco/Silicon Valley
2. Boston
3. Dallas
4. Montréal

Montréal possesses the requisite concentration of high-knowledge industry segments and professions.

Proportion of high-knowledge* jobs among the labour force



*Employment in high-technology sectors and other economic sectors in which workers are highly qualified and/or significant R&D is conducted.

Source: Lapointe, A. and Fortin, S. (2000), Positionnement de Montréal dans l'Économie du savoir: Comparaisons canadiennes et américaines, *Cahiers du CENTOR No 2000-01*; Lapointe, A. (2003), La Performance de Montréal dans l'Économie du savoir : un changement de politique s'impose, *Cahier de recherche HEC No. IEA-03-03. Special compilation by Statistics Canada drawn from census data, plus authors' calculations.*

In terms of innovation capability, Montréal ranks number one in Canada for number of scientific publications as well as number of university professors and research fellowships.

The area is also home to several worldwide R&D centres for such firms as Ericsson, Merck Frosst, Boehringer Ingelheim, BAE Systems, Rolls-Royce, Harris, Motorola and IBM.

Montréal also has an excellent track record with start-ups in the life sciences sector (e.g., BioChem Pharma, Labopharm, Axcan Pharma, Conjuchem, NeuroChem, CryoCath, BioSignal) as well as in information technology (Softimage, Discreet Logic, Matrox, Mediagrif and CGI).

However, Montréal also has major weaknesses. Despite the upward trends in high-technology and high-knowledge-content segments, the city's employment pool remains too limited to enable it to attract and retain highly qualified knowledge workers (see diagram on following page). Generally speaking, there is still a deficiency, both in growth of the number and size, of high-tech and high-knowledge firms.

In the opinion of the young Montrealers engaged in knowledge-based activities who were surveyed by the Committee, this is Montréal's main disadvantage. Although many living outside the country say they would willingly return to Montréal, they feel that it does not offer a sufficient number of attractive jobs involving international-scale mandates. They also complained of a lack of opportunities for lateral move from one firm to another.

Montréal also lags behind in the high-growth services sector, one of the most dynamic economic activities in major urban centres. Positions in accounting, management consultancy, finance, insurance and real estate account for only 7% of jobs in Montréal, versus 11% in Toronto (1996), and Montréal ranks last among major North American cities in this regard.

Although Montréal performs well in areas other than the financial-services sector (for example, in design and architecture), it still needs to bolster its overall position in the high-growth services sector. Even in a context of geographical proximity to Toronto comparable, for example, to the relationship Boston enjoys *vis-à-vis* New York City (i.e., a major high-tech centre near a key financial centre), Montréal would still need to improve its performance in high-growth services sector if it were to match that comparison.

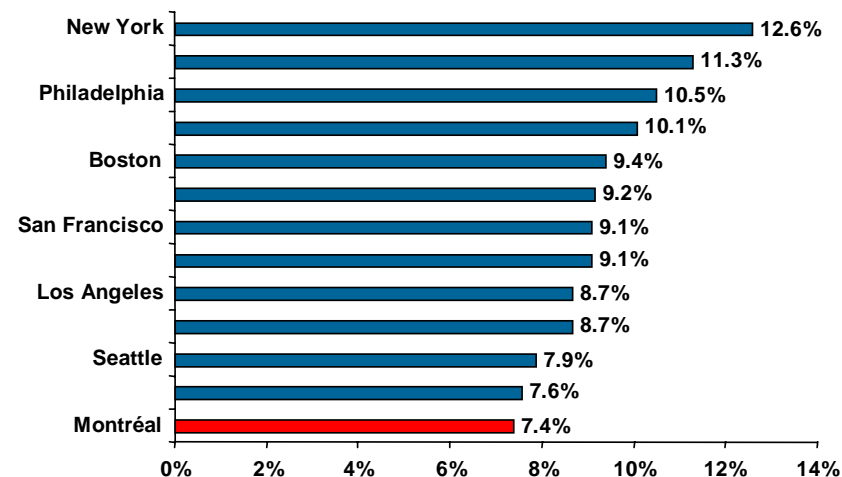
Montréal must continue modernizing its manufacturing sector and raise its proportion of leading-edge services.

Make-up of the manufacturing sector

Industries:	Montréal		Toronto
	1976	1997	1997
Science-based	9.2	16.6	12.5
Product-differentiated (adapted to demand)	9.4	11.5	13.6
Labour-intensive	43.7	31.0	19.8
Natural-resources-intensive	21.1	24.1	24.4
Scale-based	16.4	16.9	29.7
	100%	100%	100%

Source: Vinodrai, T. (2001), A Tale of Three Cities: The Dynamics of Manufacturing in Toronto, Montréal and Vancouver, *Statistics Canada, Analytical Research Branch, Paper No. 177*.

Significance of the high-growth services sector — accounting, consultancy and finance/insurance/real estate (1996)



Source: Coffey, W.J. and Polèse, M. (1999), La restructuration de l'économie montréalaise : Positionnement et comparaisons avec d'autres métropoles, *Montréal: INRS-Urbanisation, Études et documents*.

Improving Montréal's positioning

To safeguard its assets and strengthen its position as a knowledge city over the medium and longer term, Montréal must significantly enhance its critical mass of high-knowledge activities. The Committee believes actions should be taken on three critical fronts:

- The innovation process;
- Development of human capital; and
- Attraction and retention of qualified immigrants.

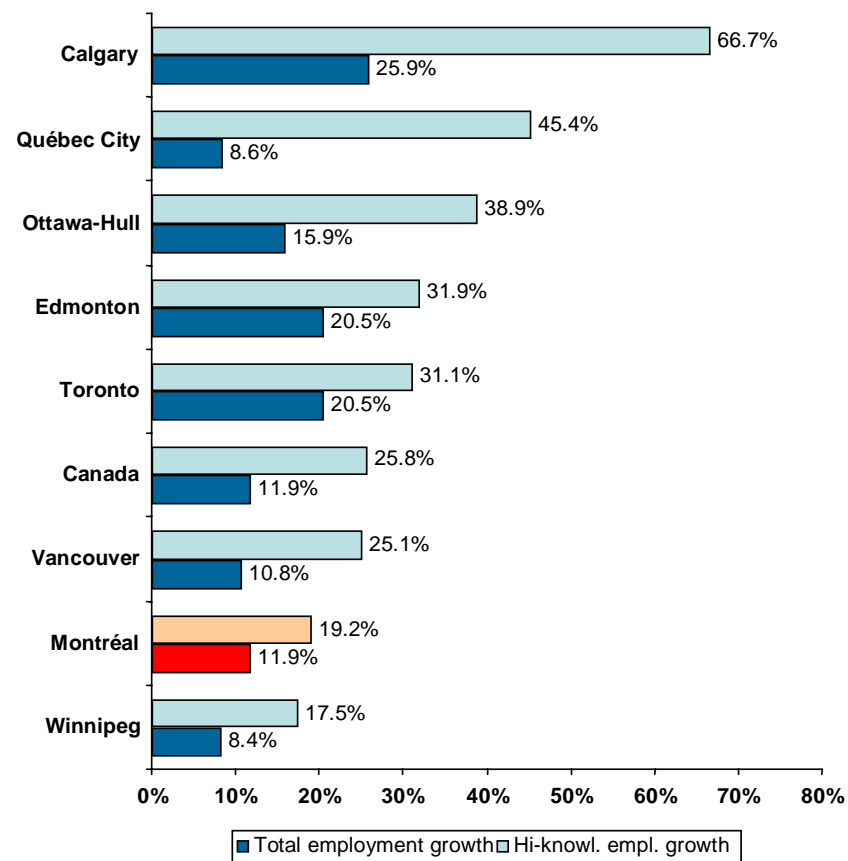
1) The management of innovation

In recent years, considerable effort has gone into stimulating development of the knowledge-based economy in Montréal. Attracting high-tech companies from abroad, consolidating a bio-pharmaceutical sector, growing the number of knowledge workers in the IT industry, creating sector-based venture-capital funds, and modernizing course curricula in universities and colleges — all are examples of the dynamic approach demonstrated by a large number of institutions and individuals.

That dynamic approach must not under any circumstances be abandoned; it is vital that the process of innovation continue in Montréal. In spite of a high concentration of university students and significant investment in R&D, the number of patents awarded per capita in leading-edge sectors in Montréal lags behind the rest of North America, and investment in these sectors remains low.

Growth in Montréal's knowledge-based economy must be stepped up overall.

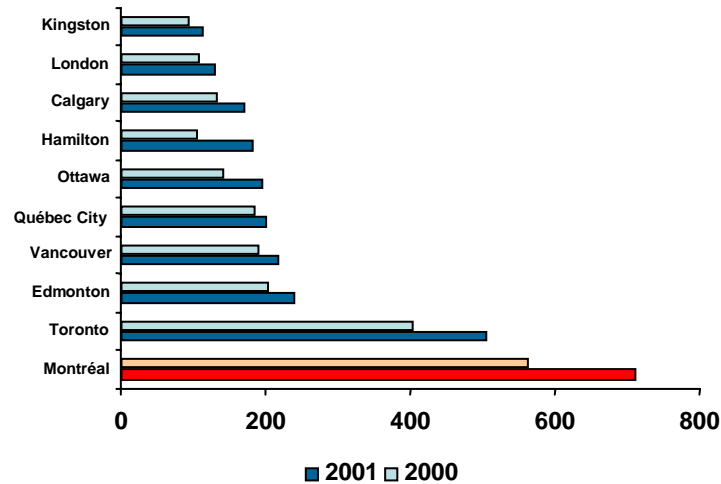
Total employment growth vs. growth in high-knowledge jobs (1996–2001)



Lapointe, A. (2003), La Performance de Montréal dans l'Économie du savoir : un changement de politique s'impose, *Cahier de recherche HEC No. IEA-03-03. Special compilation by Statistics Canada drawn from census data, plus author's calculations.*

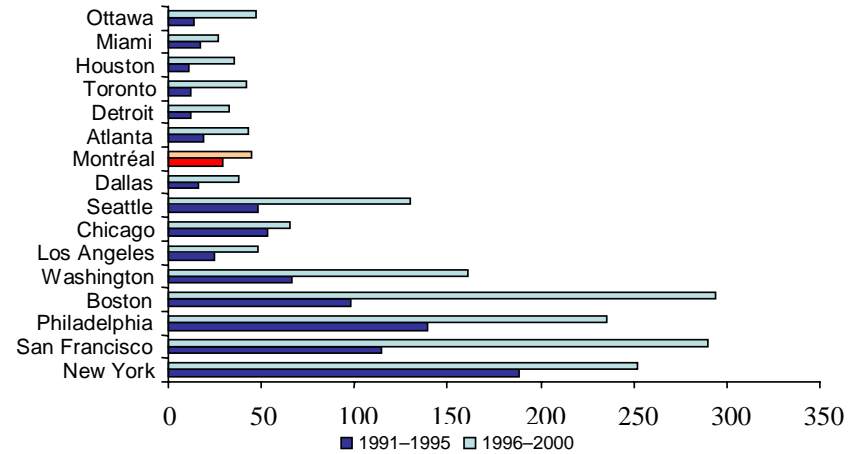
Despite solid foundations, the innovation process in Montréal remains relatively weak in comparison to other cities.

University research in major Canadian cities (all industries, millions of \$)



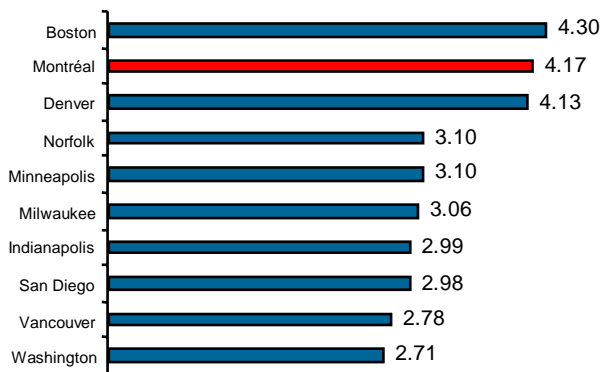
Source: Research Infosource. Compilation: Montréal International.

Numbers of bio-pharmaceutical patents awarded in major urban centres (per million inhabitants)



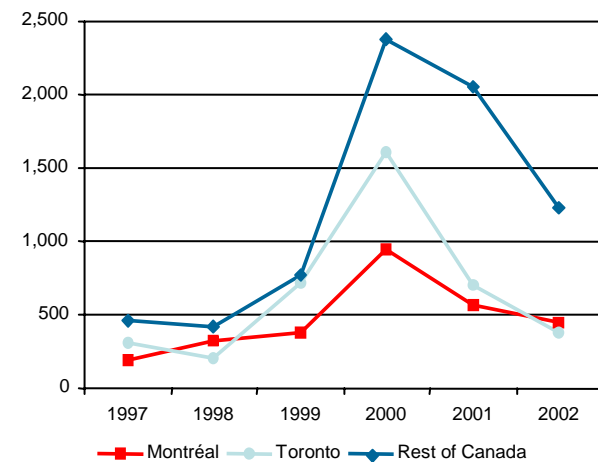
Source: United States Patent and Trademark Office; Canadian Science and Innovation Indicators Consortium (CSIIC)

Percentage concentration of university students by metropolitan area (1998)



Source: McGill University

Venture-capital investment in IT and bio-pharmaceuticals (millions of \$)



Source: Mary Macdonald & Associates Ltd.

The majority of experts who, over the past five years, have examined the causes of the weakness of the innovation process in Montréal point to three determining factors:

- A lack of organizational skills and resources at various stages of the R&D process;
- An hesitant private equity market; and
- A small portfolio of technologies to promote.

Considerable progress has been made on these fronts, but it is absolutely essential that even more be done. Despite Montréal's smaller size in comparison with other metropolitan areas, it should be possible to develop highly-regarded models for propelling the innovation process. Montréal could draw inspiration from some of the practices that have led to success in regions like Silicon Valley. Two ingredients are key in explaining Silicon Valley's success.

The first consists of creating the best conditions for stimulating entrepreneurship through the use of informal networks (so-called *weak ties*) that help to promote novel ideas, and the presence of local private equity funds and so-called *angel investors* willing to back projects that are deemed risky.

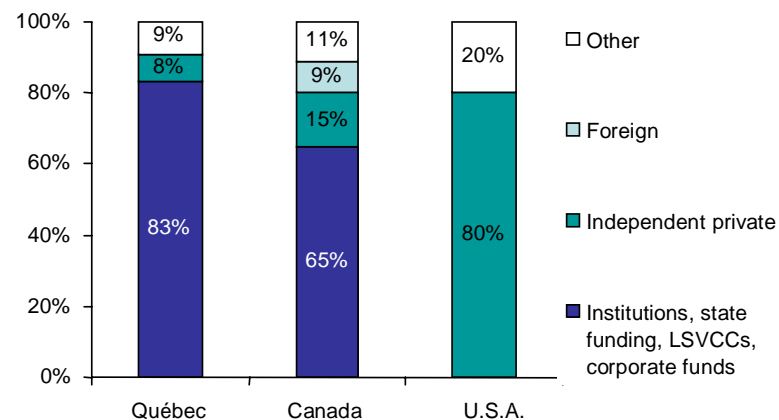
The second practice involves encouraging the emergence of well-balanced technology clusters. In the case of Silicon Valley, the information and communications technology (IT) sector possesses a real critical mass. The healthy R&D activity in the region, along with the presence of major companies, facilitates the incubation of new ideas and takeovers of younger companies. This means products and services developed can then be rapidly brought to the mass-production and mass-marketing stages, which in turn spurs job growth. Young entrepreneurs whose companies are bought out tend to reinvest their earnings locally. In addition, mobility of knowledge workers throughout the region (from large to small IT companies, from investment funds to consultancy and to IT-related R&D centres) encourages cross-fertilization of ideas and the building of competitive product and service offerings within start-up companies, which stand out via improved products, differentiated products, or entirely new business processes.

In Québec, however, both the financing and the dynamics of innovation are structured differently. Independent private equity investors account for barely more than 8% of all venture-capital investments, and foreign investment is practically nonexistent. Venture-capital sources are primarily governmental and institutional.

At present, the Montréal knowledge economy clearly needs new sources of private funding. The general consensus is that the industry is sufficiently mature to allow for the emergence of independent private equity players. Private investment, insofar as it would be encouraged by the Québec government, would immediately begin stimulating growth in the Montréal knowledge economy. Private investors would also bring expertise complementary to that of state and institutional investors, in such areas as assessment of market potential for new technologies, and provision of the organizational skills necessary to foster the growth of young companies.

It is vital that the private equity markets be stimulated.

Venture-capital investments, Q2 2003



Source: Mary McDonald & Associates Ltd., Réseau Capital

2) Development of human capital

Currently, only 20% of Montrealers have a university degree, compared to an average of 28% in North American metropolitan areas (2000). Similarly, the proportion of post-secondary graduates among Montrealers aged 25 or over is below that of major Canadian cities.

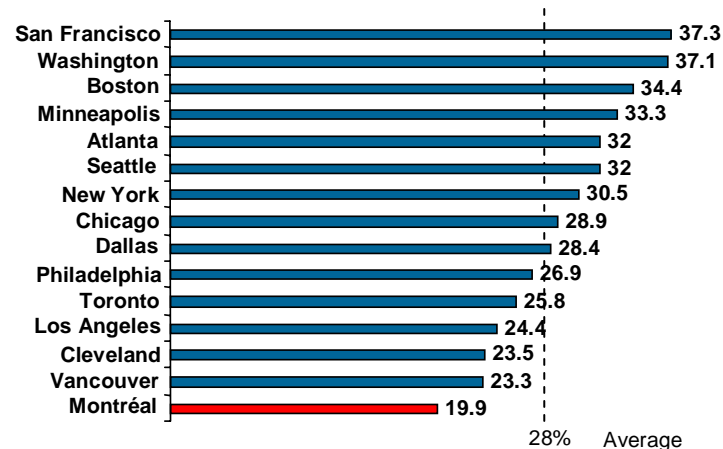
Encouraging the continuation of studies until the university level is today a basic necessity for any knowledge city. The expanding high-knowledge fields demand a great deal of know-how and skills, and involve multiple scientific, technological and artistic disciplines — often simultaneously.

School dropout rates remain a particularly alarming statistic in Montréal, the crux of a key problem with serious societal consequences. Unemployment rates, predictably, are high among individuals without post-secondary diplomas, and their labour market reintegration capacity remains extremely low.

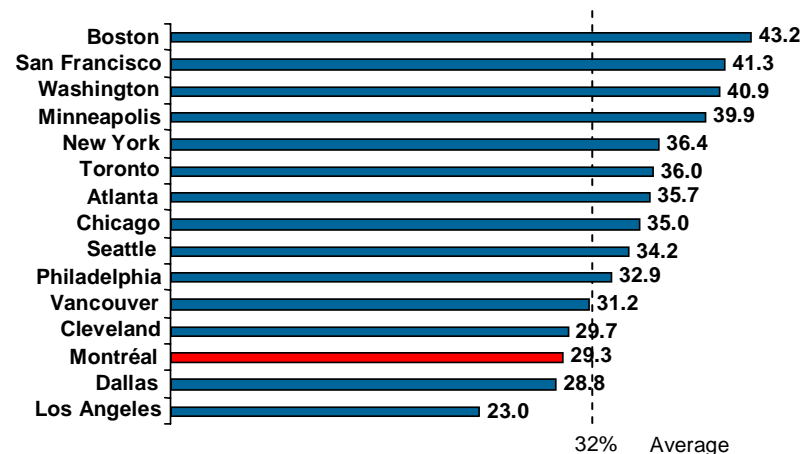
Though it did not have access to equivalent statistics on dropout rates from other world cities of comparable size, the Committee can safely assert that a metropolis such as Montréal cannot afford to lose even a single young mind at this critical juncture, as the city steps boldly into the knowledge era.

To assert its identity as a knowledge city, Montréal must encourage retention and completion among its students.

Percentage of population with a post-secondary degree (2000*)
Metropolitan areas, adults 25 and older



Same statistic, adults 25–34



*2001 for Canadian CMAs

Source: U.S. Census Bureau, 2000 Census; Statistics Canada, 2001 Census; Compilation: Montréal Metropolitan Community

While it acknowledges the complex nature of the issue and appreciates the many initiatives under way at all levels of Montréal society, the Committee believes that even more efforts must be deployed to find a definitive solution to the problem of dropouts and to support retention and completion.

The issue of funding for post-secondary education is also cause for concern. If one considers data relative to expenses per student — which is the main barometer of competitiveness compared to public universities in the rest of Canada and in the United States — it becomes clear that the shortfall in Québec university funding compared to those in the rest of Canada is in the order of \$375 million (see table on following page).

The funding framework for college-level educational institutions is also problematic. Although many Montréal colleges have sufficient space and teacher resources to welcome more students, they cannot do so because budget freezes have led to the institution of admission quotas. The Committee's opinion is that the situation is a disincentive to learning and that alternative financing models should be sought over both the short and long terms.

Another key to promoting academic retention and completion is to further break down the walls between institutional levels (primary school, secondary school, college, university) so that young people can make a smoother transition from one stage to the next and have a better picture of the career choices available to them.

Some examples of successful de-institutionalization exist in Montréal (see diagram on following page). Among other things, these initiatives enable talented students to progress more rapidly and join research teams. The Committee recommends that more of these experiments be conducted.

Increasing the numbers of post-secondary graduates is an issue for all Montrealers.

Relationship between unemployment and education level

Education level reached:	Job growth 1990–2001 (%)	Unemployment rate, 1998 (%)
University degree	+ 63.7	5
Post-secondary diploma	+ 40.9	5.8
Secondary school diploma	+ 5.1	10
Did not finish secondary school	-32.5	15

Data for all of Québec

Source: *Fafard, Michèle (2002), Actes du Forum régional de l'île de Montréal sur la persévérance, la réussite scolaire et le soutien aux rattachés, Direction régionale de Montréal du ministère de l'Éducation, p. 6.*

Retention and completion targets

	Target for 2010	Performance 1998–1999
Proportion of generation completing secondary school diploma before age 20	85%	72%
Proportion of generation completing an initial diploma of collegial studies	60%	39% ¹
Proportion of generation completing a university degree	30%	27%

Data for all of Québec

1. Data for 1997–98 (1998–99 data unavailable)

Source: *Excerpted from Plan stratégique 2000-2003, Québec Ministry of l'Éducation*

In addition, more needs to be done to encourage bridges across universities, in order to promote joint course curricula leading to recognized professional qualification. In short, learning and training opportunities for both youth and adults must be expanded. The institution of a resolutely learning-oriented culture is one of the prerequisites for a positioning as a top knowledge city.

3) Attraction and retention of qualified immigrants

Montréal must compensate for its low rate of demographic growth by attracting highly qualified immigrants (see tables on following page). At present, however, its performance in this regard is lagging behind those of Toronto and Vancouver. Montréal tends to attract fewer university graduates and a greater proportion of individuals with secondary-school-level qualifications. This situation has a considerable impact on its positioning as a knowledge city.

Knowledge workers from abroad who have settled in Montréal within the past four years told the Committee that there are marked inefficiencies in the processing of qualified immigrants. They pointed to, among other things, sluggish bureaucratic procedures, the lack of a single-window system that would facilitate arrival of knowledge workers, and unexplained complications when it comes to obtaining documents as basic as a driver's permit or health insurance card. Confronted with such situations, some workers said they might even reconsider plans to settle in Québec.

There are some notable examples of deinstitutionalization that could be expanded upon.



Training in agriculture

- Joint course curricula
- Professors teaching in both institutions at once
- Integration of talented young college-level students into university-level research programs and teams

Hexagram: Institute for Research and Creation in Media Arts and Technologies

Partners:
Concordia University
UQAM

Hexagram is a non-profit group bringing together over 60 researchers and more than 250 graduate students. Its aim is to build partnerships with industry players to develop innovative new forms of communication and expression that rely on new technologies.

Just as important is attainment of the proper funding levels for our colleges and universities.

Québec universities' lack of financial resources for teaching and supervising students, compared to the rest of Canada

Year	Shortfall compared to rest of Canada (millions of \$)
1995-96	100.2
1996-97	147.1
1997-98	281.0
1998-99	433.1
1999-00	428.9
2000-01	421.7
2001-02	388.5
2002-03	375.3

Source: Conférence des recteurs et des principaux des universités du Québec (CREPUQ)

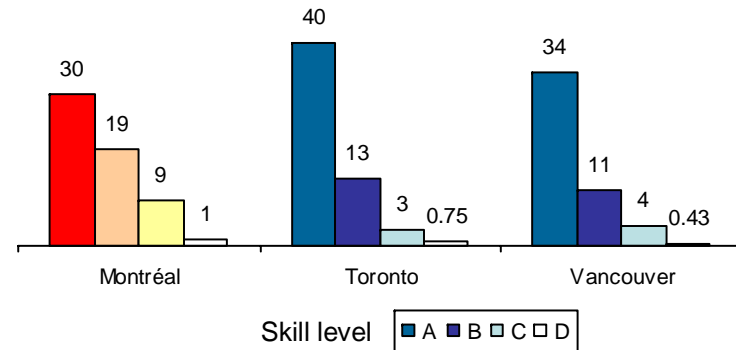
Professional integration of workers' spouses is also an issue. Recent surveys of knowledge workers show that their choice of city is also largely dependent on their spouse's potential to secure stimulating employment in the same city. Workers interviewed by the committee also pointed to frequent problems obtaining work permits.

Although the majority of interviewees have an immense appreciation for Montréal's unique character and authenticity, many of them mentioned to the Committee that they have difficulty accessing information as well as services online (e-government). They also complained about the lack of welcoming structures that would direct new knowledge workers toward the services most likely to satisfy their needs. They also expressed the desire to have rapid and easy access to peer networks. In addition, a fair number of knowledge workers of foreign origin would like to see a wider choice of languages of instruction for their school-age children.

Generally speaking, the city selection criteria that matter to knowledge workers are those having to do with purchasing power, the high-knowledge employment pool, the city's international stature, and the presence of a pervasive knowledge culture.

Montréal must attract more qualified immigrants.

Immigrants by skill level, 2002 (%)



Skill levels are based on National Occupational Classification system.

A: Occupations usually require university education.

B: Occupations usually require college education or apprenticeship training.

C: Occupations usually require secondary school and/or occupation-specific training

D: On-the-job training is usually provided for occupations.

Source: Citizenship and Immigration Canada

Demographic growth rates

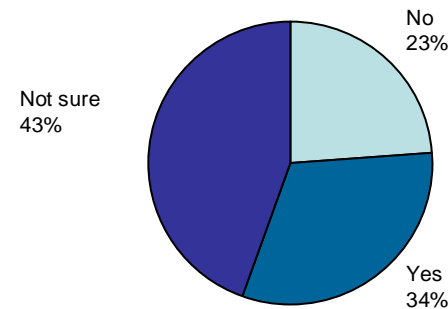
Census metropolitan area	1996	2001	% growth
Toronto	4,263,757	4,682,897	9.8
Montréal	3,326,510	3,426,350	3.0
Vancouver	1,831,665	1,986,965	8.5
Ottawa-Hull	1,010,498	1,063,664	5.3
Calgary	821,628	951,395	15.8
Edmonton	862,597	937,845	8.7
Canada	28,846,760	30,007,094	4.0

Source: Statistics Canada, 1996 and 2001 censuses

In this context, the question becomes: Is Montréal a knowledge city? The answers given by Committee interviewees were rather ambivalent. The majority feel that the presence of university campuses in the downtown core is an undeniable asset. As to quality of life, most describe it as incomparable, despite average wages that are lower than in the U.S. and a heavy income tax burden. Montréal's openness to the world is also appreciated, along with its role as a bridge between the U.S. and Europe. However, as mentioned earlier, the lack of critical mass in high-knowledge industries comes in for criticism, as does the fact that Montréal possesses few internationally significant clusters and does not do enough to raise awareness of those it does possess (e.g., aerospace).

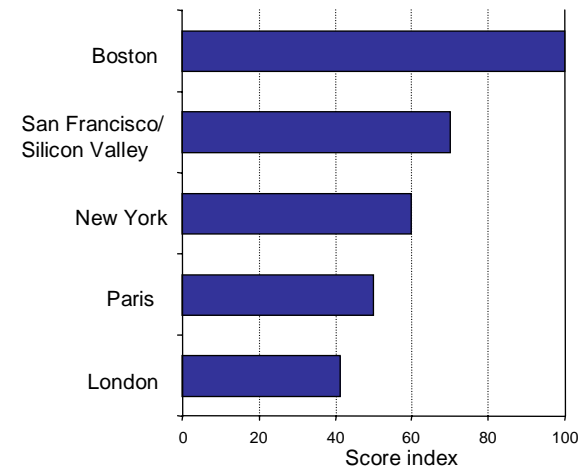
Knowledge workers' perceptions of what a knowledge city should be

"Is Montréal a knowledge city?"



At present, too many Montréal knowledge workers are ambivalent about the issue.

What best exemplifies a "knowledge city"?



Montréal knowledge workers spontaneously cite the following as key to a city being perceived as a "knowledge city":

- High intensity of knowledge
- Presents characteristics of a "planetary" city: vibrant, at the heart of significant transformations, intellectually and socially stimulating

Source: One-on-one ideation sessions during spring and summer 2003 with 100 talented Montrealers, both native and adoptive, and of francophone, anglophone and allophone origin), age 20-40, now living in Montréal or abroad. See appendix for sample composition.

ESTABLISHING MONTRÉAL AS A KNOWLEDGE CITY

1.1 UNDERSTANDING WHAT A KNOWLEDGE CITY IS

1.2 POSITIONING MONTRÉAL IN THE KNOWLEDGE ERA

1.3 HARNESSING MONTRÉAL'S VITAL FORCES

1.3 HARNESSING MONTRÉAL'S VITAL FORCES

Montréal abounds with examples of the interdisciplinarity that is a hallmark of the new knowledge-based economy. The city's universities are increasing opportunities for collaborations between professors, research fellows and students working in several specialized fields (e.g., engineering, medicine, physics, computer science), whether through construction of new buildings, establishment of course curricula, or projects to commercialize research.

Arts institutions, too, are embracing the movement. ADÉSAM (the Association des écoles supérieures d'art de Montréal, or Association of Montréal arts schools) is one example of taking down walls between disciplines. It functions as a sort of communal laboratory bringing together Montréal's art schools and creating multiple opportunities for exchanges in the performing and creative arts in such varied disciplines as cinema, the circus arts, theatre, dance, photography and painting.

In addition, several newly created Montréal organizations have missions that involve juxtapositions of the arts, science and technology in original, innovative ways. The SAT (Society for Arts and Technology) is one of these new informal and constantly evolving venues with which young knowledge workers strongly identify. The Daniel Langlois Foundation, for its part, is continually shepherding several innovative arts projects at the crossroads of leading-edge disciplines.

Increasingly, the development of knowledge in Montréal is proceeding under the banners of synergy, interdisciplinarity, decompartmentalization and emulation. From this perspective Montréal is clearly part of the network of knowledge cities. However, many native and adoptive Montrealers with whom the Committee spoke regretted the fact that many of these loci of knowledge and creative talent remain, in large part, hidden treasures. The Committee's interviewees mentioned the great wealth of institutions such as the Cinémathèque québécoise, the Canadian Centre for Architecture, and the Centaur Theatre, to name a few.

Montréal lies at the heart of development of the new forms of knowledge and creativity, at the frontiers of art and science.

Eduardo Kac: *Genesis 1*



Source: www.fondation-langlois.org

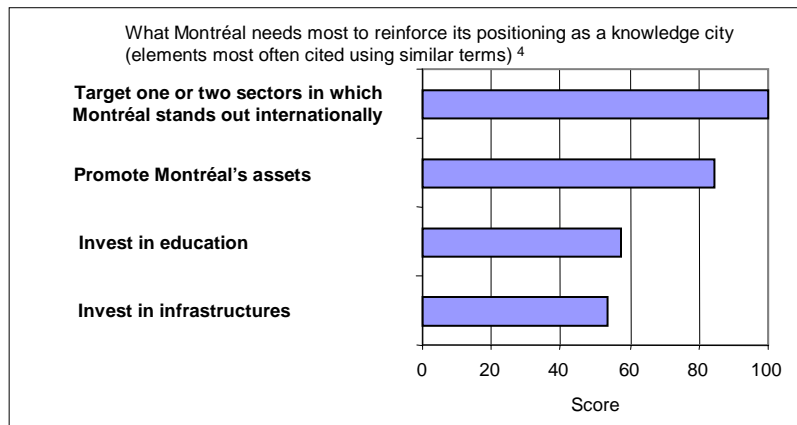
An example of a project at the frontier of knowledge that blends art and science:

Genesis 1 (1999) is the world's first transgenic art installation. Its creator, Eduardo Kac, produced a synthetic gene by translating a verse from the Book of Genesis into Morse code, then converting the code into DNA base pairs using a conversion principle developed specially for the work. The gene was then incorporated into *E. coli* bacteria. Virtual gallery visitors could intervene via the Internet, remotely turning on an ultraviolet light in the gallery space and causing the bacteria to mutate. The entire installation is housed in a structure protected from ultraviolet light, rendering the bacteria inoffensive to gallery visitors.

The **Daniel Langlois Foundation** is supporting the artist in his development of *Genesis 2*, which will focus on the protein produced by the synthetic gene created in *Genesis 1*.

From the *Ars Electronica* catalogue devoted to the *Genesis* project: "Artists such as Eduardo Kac are working on proposals for our immediate future, in which the traditional differentiation between natural and artificial, which has been constructed along the lines of the concepts organic and self-organized for living beings and externally determined for machines, will no longer be valid. This is a development that challenges us to a new self-comprehension [. . .] If we go on from the representation and simulation of life to the creation and shaping of life, then this is an area, from which art cannot abstain."
Gerfried Stocker, "Uprising," in *Genesis* (Linz, Austria: O. K. Center for Contemporary Art, 1999), pp. 42–43.

Generally, Montréal knowledge workers feel that what Montréal needs most at the present time is a true strategy for showcasing industry segments in which the city displays strong competencies and superior creative talents – those areas in which it stands out on a world scale.



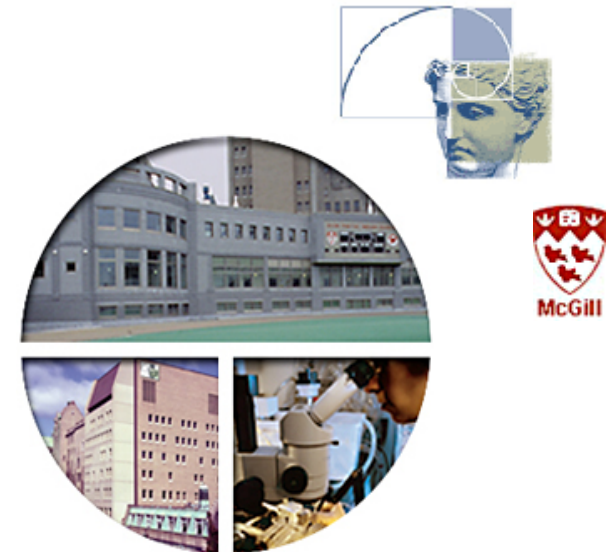
Any list of these sectors would have to include neuroscience, a field in which Montréal has a rich history and world-renowned institutions it can build on. Several decades ago the work of Dr. Wilder Penfield at the Montréal Neurological Institute (MNI) had already attracted worldwide attention. The institution is a leader in the treatment of tumours and neuromuscular diseases. Spin-off companies that have been created through the MNI include Neurochem, a Montréal-based pharmaceutical company whose product candidates (designed to treat nervous system disorders) have reached the clinical testing stage. There are other examples of renowned Montréal institutions in the biomedical field.

4. Source: One-on-one ideation sessions during spring and summer 2003 with 100 talented Montrealers, both native and adoptive, and of francophone, anglophone and allophone origin), age 20-40, now living in Montréal or abroad. See appendix for sample composition.

The metropolis enjoys worldwide renown in the bio-medical sector for the quality of its institutions.

The Montréal Neurological Institute and Hospital is among the institutions that have made Montréal a world-renowned centre for bio-medical sector.

The MNI was founded in 1934.



Some facts about the Montréal Neurological Institute and Hospital:

- Houses the largest group of neuroscientists in Canada.
- Five of the Institute's professors have been elected to the prestigious Order of Canada: Dr. Donald Baxter, Dr. Gilles Bertrand, Dr. Brenda Milner, Dr. William Feindel and Dr. George Karpati.
- Dr. Milner is a pioneer of neuropsychology and has trained almost every one of the leading North American specialists in this field.
- The Institute is a leader in several fields, including functional surgical navigation, treatment of epilepsy, detection and healing of brain tumours, and treatment of multiple sclerosis.

Source: www.mni.mcgill.ca

Knowledge workers also appreciate Montréal's "neutrality" — the way in which it forms a natural bridge between North America and Europe, by reason not only of its geographical position but also its cultural, ethnic and linguistic diversity.

The people interviewed by the Committee believe that Montréal clearly fulfills many of the expectations expressed as regards the characteristics of a knowledge city (see tables on following page).

Despite lower salaries than in the U.S. and a tax system that no one would describe as competitive, many knowledge workers pointed to Montréal's high standard of living as one of its key assets. Interviewees mentioned the relatively low cost of housing, short commutes, and the accessibility of outdoor activities and choice artistic and cultural activities.

Montréal's marked disadvantages

The fact remains that, while knowledge workers tend to appreciate the quality of life in Montréal, they clearly identify the difficult tax situation as the city's principal disadvantage. It is obvious from the interviews held by the Committee that if Montréal is to attract and retain knowledge workers, Québec's provincial income tax rates must be brought into line with those in the rest of Canada.

Second, declining infrastructures (e.g., roads in disrepair, graffiti, dirtiness of certain streets and Métro stations) are a significant handicap for Montréal.

Third, many of the Committee's interviewees believe that the diverse political debates that prevail in Montréal are a hindrance to initiative and cause the city to stray from its "natural trajectory of creativity and entrepreneurship."

Fourth, as has been mentioned repeatedly in this document, the limited pool of jobs available to knowledge workers represents one of Montréal's most marked disadvantages as a knowledge city.

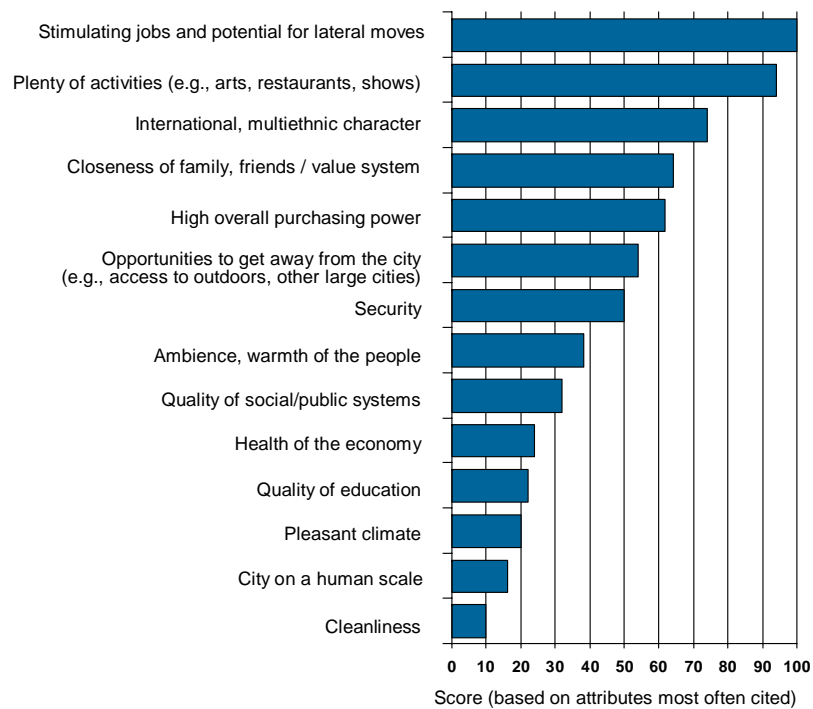
Montréal's harsh winter climate is also considered by many individuals to be a major disadvantage, insofar as knowledge workers ascribe great value to outdoor activities, and especially the city's enviable socio-cultural fabric, which only reaches its fullest expression in the summer, with its many festivals and vibrant neighbourhood life.

Among other disadvantages of Montréal, many knowledge workers told the Committee about experiencing a feeling of isolation stemming from the impression they are not at the heart of key developments in the world — e.g., in leading-edge sectors — or that they are missing out on certain significant societal trends at the frontiers of knowledge.

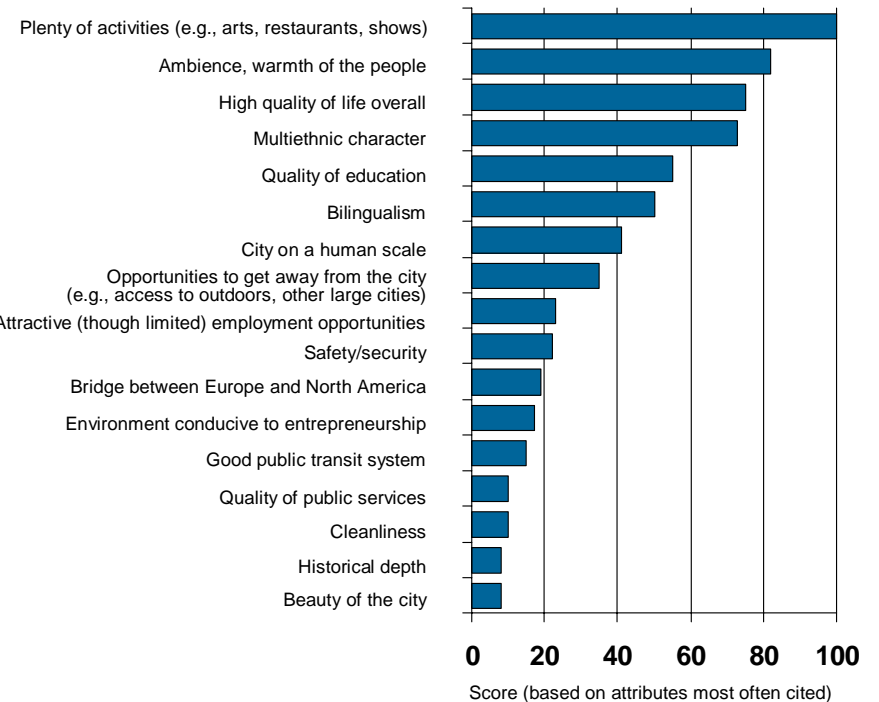
The Committee believes that such an impression speaks in large measure to the difficulty Montréal has in showcasing its assets and its networks, which are clearly "wired to the modern world."

The most important criterion lacking in Montréal: an adequate pool of high-knowledge jobs.

Attributes of a city that are **important** to Montréal knowledge workers



Montréal's assets in the eyes of Montréal knowledge workers



Source: One-on-one ideation sessions during spring and summer 2003 with 100 talented Montrealers, both native and adoptive, and of francophone, anglophone and allophone origin), age 20-40, now living in Montréal or abroad. See appendix for sample composition.

Strengths and weaknesses

We have seen that Montréal has some strong assets to carry it forward into the knowledge era, but also faces many challenges. And yet the attachment Montréal knowledge workers feel for their city is undeniable. The majority of workers the Committee spoke to said they would prefer it to any other city, were it not for the shortcomings mentioned.

For knowledge workers who have children, there is the extra dimension of the education system, which is a source of great concern. While acknowledging the quality of the system, founded on values of openness and modernity, they worry about the fact that it does not enable students to learn a variety of languages, which would better equip them for the globalization era.

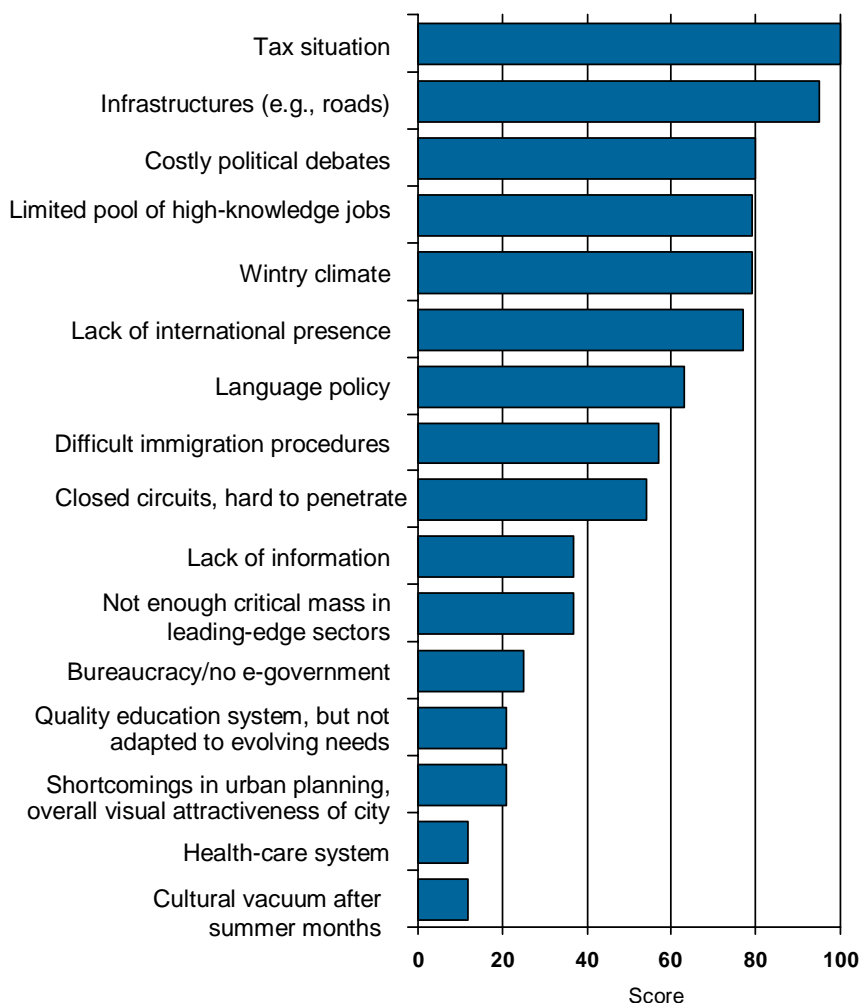
Overall, knowledge workers have conflicting feelings about Montréal, finding that it offers striking advantages and serious weaknesses at the same time. They covet the city and what it has to offer them and their children, yet in the same breath they worry about its “trajectory.”

The Committee believes that these messages must not be ignored, given the context in which major cities have become the playing field for competition among nations. All of the world’s metropolises are jockeying for position in the knowledge era.

In many ways, this international competition is only just beginning to intensify. And one of the key challenges in this contest among urban centres remains attraction and retention of talented, creative individuals.

Perceptions regarding Montréal’s disadvantages: clear messages.

Disadvantages of Montréal according to Montréal knowledge workers
(attributes most often cited using similar terms)



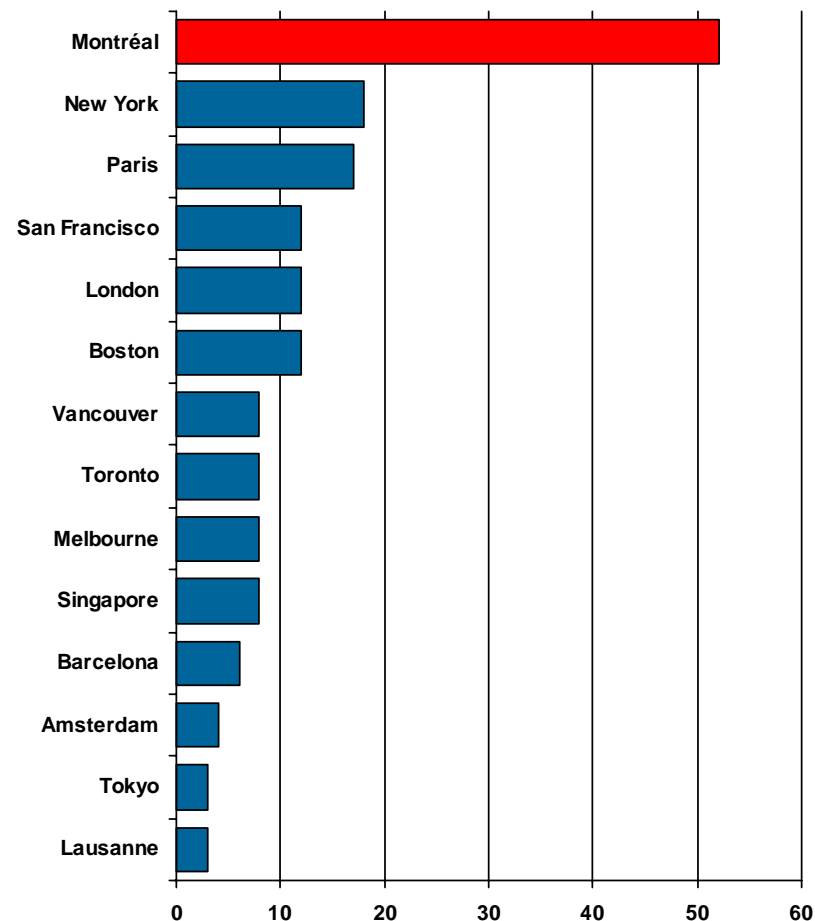
Source: One-on-one ideation sessions during spring and summer 2003 with 100 talented Montrealers, both native and adoptive, and of francophone, anglophone and allophone origin), age 20-40, now living in Montréal or abroad. See appendix for sample composition.

Faced with this situation, all of the leaders of the Montréal community have a duty to establish a clear vision to guide the metropolis in the years to come and pave the way for a strategy to make Montréal stand out as a knowledge city.

In the following chapter, readers are invited to see how other cities around the world have gone about discussing, developing and ensuring their positioning as knowledge cities. The examples presented are inspiring in several respects, not least the examples of leadership at the local level, provided by the private and public sectors as well as higher levels of government.

In large measure, Montréal meets knowledge workers' expectations — except for certain very specific constraints.

**Cities in which knowledge-worker interviewees would settle if there were no constraints
(15 cities most often cited)**



Source: One-on-one ideation sessions during spring and summer 2003 with 100 talented Montrealers, both native and adoptive, and of francophone, anglophone and allophone origin), age 20-40, now living in Montréal or abroad. See appendix for sample composition.

KNOWLEDGE CITIES: AN OVERVIEW

2.1 IDENTIFYING SUCCESS FACTORS FOR CITIES

2.2 A FOCUS ON STRUCTURE-ENHANCING IDEAS IN VARIOUS FIELDS

2.3 “FAILURE FACTORS” MUST NOT BE IGNORED

“The real difficulty lies not in developing new ideas, but in escaping from the old ones.”

J.M. Keynes

“People who say that it cannot be done should not interrupt those who are doing it.”

George Bernard Shaw

In recent years, many cities around the world have embarked on initiatives that involve discussions, collaborative efforts and establishment of strategies aimed at honing their competitive edge on the national, continental and international scale.

In this section the Committee looks at how certain cities (on every continent) have gone about ensuring their success in the knowledge era.

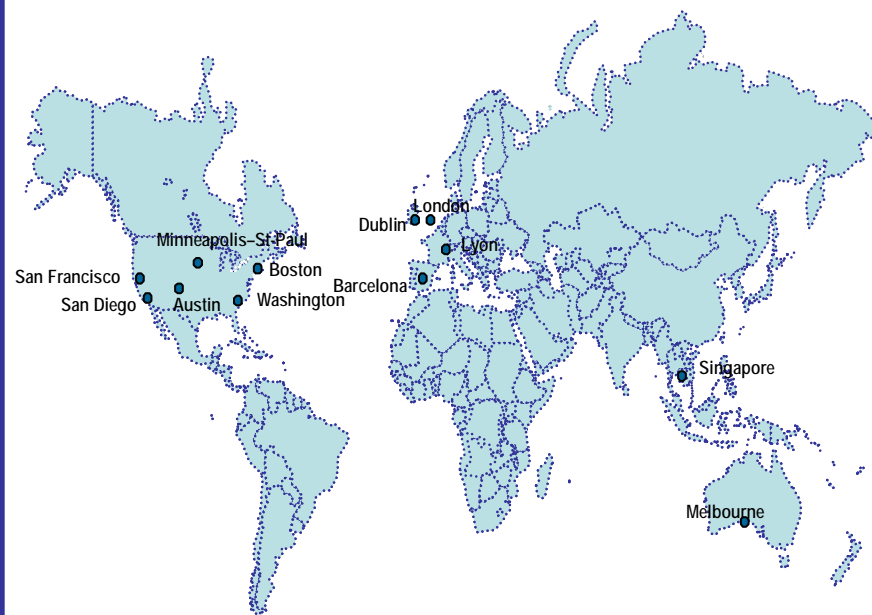
In several respects, the initiatives undertaken by these cities are in keeping with the development thrusts for knowledge cities described in the previous section:

- Building on a vigorous knowledge-based economy;
- Developing a pervasive knowledge culture; and
- Investing in an attractive, stimulating urban dynamics, e.g., to attract and retain talented workers.

Readers will note that efforts in these cities have been rigorously oriented toward a convergence of strategies — particularly as concerns economic development — and that positioning efforts have been particularly fruitful in cities where the private-sector leadership was strong.

Cities invest major efforts to improve their competitive positioning in the knowledge age; some are at the top of world competitiveness indices.

Main cities studied



Top 5 on the World Knowledge Competitiveness Index, 2002
(R. Higgins & Assoc. U.K.)
Minneapolis-St. Paul
San Francisco
Austin
Denver-Boulder-Greely
Washington, D.C.

Top 5 on the Creativity Index, 2002
(Richard Florida, U.S. cities only)
San Francisco
Austin
San Diego
Boston
Seattle

Cities appearing most often in the literature and in discussions with experts referring to the intensity and success of their efforts
Dublin
Lyon
Barcelona
Munich
Melbourne

Most competitive regions according to the IMD World Competitiveness Index, 2003; population 20 million or less
Finland
Singapore
Denmark
Hong Kong
Switzerland

2.1 IDENTIFYING SUCCESS FACTORS FOR CITIES

From cities with an international stature, such as Boston, London and Singapore, to medium-sized cities like Lyon, Munich and Stockholm and smaller ones including Waterloo, Ontario, Bilbao, Spain, and Portland, Oregon, urban areas around the world are taking steps to ensure their success in the knowledge era.

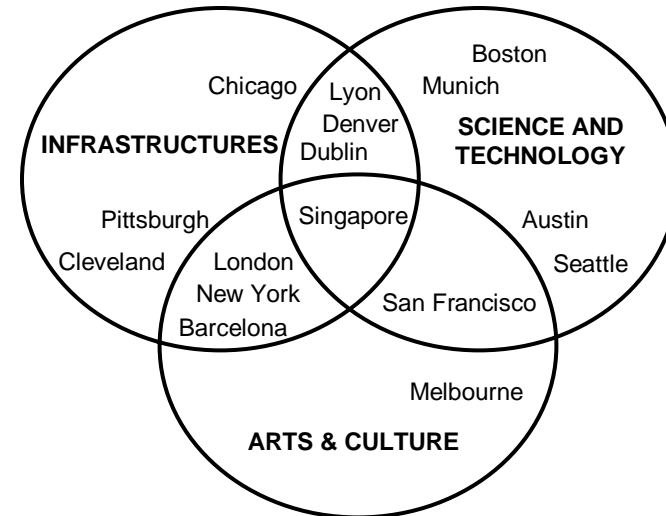
The Committee decided to study a certain number of cities that have undertaken outstanding efforts to position themselves as knowledge cities. Some of them clearly stand out today as high-knowledge cities, at the forefront of new scientific developments (as, for example, Boston). Others have undertaken considerable efforts to transform their industrial structures and invest in high technology (e.g., Dublin). Still others (Barcelona among them) have built on their specific cultural and artistic assets to assert themselves in the knowledge era. These examples can serve as avenues of inspiration for Montréal's strategies. They can clarify discussions on which approaches are most viable for Montréal — i.e., the ones that offer the best “fit” with the city's context and its vital forces.

The direction taken by cities in the knowledge era generally takes the form of a mix of science and high-technology investments, traditional infrastructure investments, and strategic investments in the arts and culture. Each city is distinctive in its particular mix of investments and implementation mode.

Chicago, for example, has opted for a positioning as a platform for knowledge exchange. Building on its centralized geographical location (typical 'hub'), availability of large real-estate sites that can house convention and conference centres, and its first-rate transportation infrastructure (air, road and rail), it has pursued a goal of attracting conventions, professional events and meetings in all areas of knowledge, from design to high technology to the bio-medical industries. The hosting of such events not only generates immediate economic benefits, but ensures the periodic presence of communities of professionals in dynamic knowledge fields.

To position themselves as knowledge cities, cities combine traditional (infrastructure-type) investments with new ones (arts, science, technology) according to their own specific mix.

Cities' positionings in the knowledge era



The infrastructures approach hinges on traditional investments, i.e., large-scale, fixed-capital projects that bring the city international recognition (e.g., NGOs, exhibitions, the Olympic Games, major financial centres, mega-convention centres).

The sci-tech approach fosters the development of institutions and R&D activities at the leading edge of knowledge (e.g., bio-science, information and communications technologies) as well as in high-tech sectors (e.g., telecommunications, aerospace).

The arts & culture approach emphasizes participatory activities (e.g., street life, participation of one and all in enabling activities, facilities accessible by all) and a melding of arts and high technology that propels the arts into a new dimension.

One may observe that the main direction taken by each city depends on three key factors:

- The city's degree of industrialization or post-industrialization;
- Specific advantages on which the city can build so as to differentiate itself;
- Cultural traits specific to the country and region.

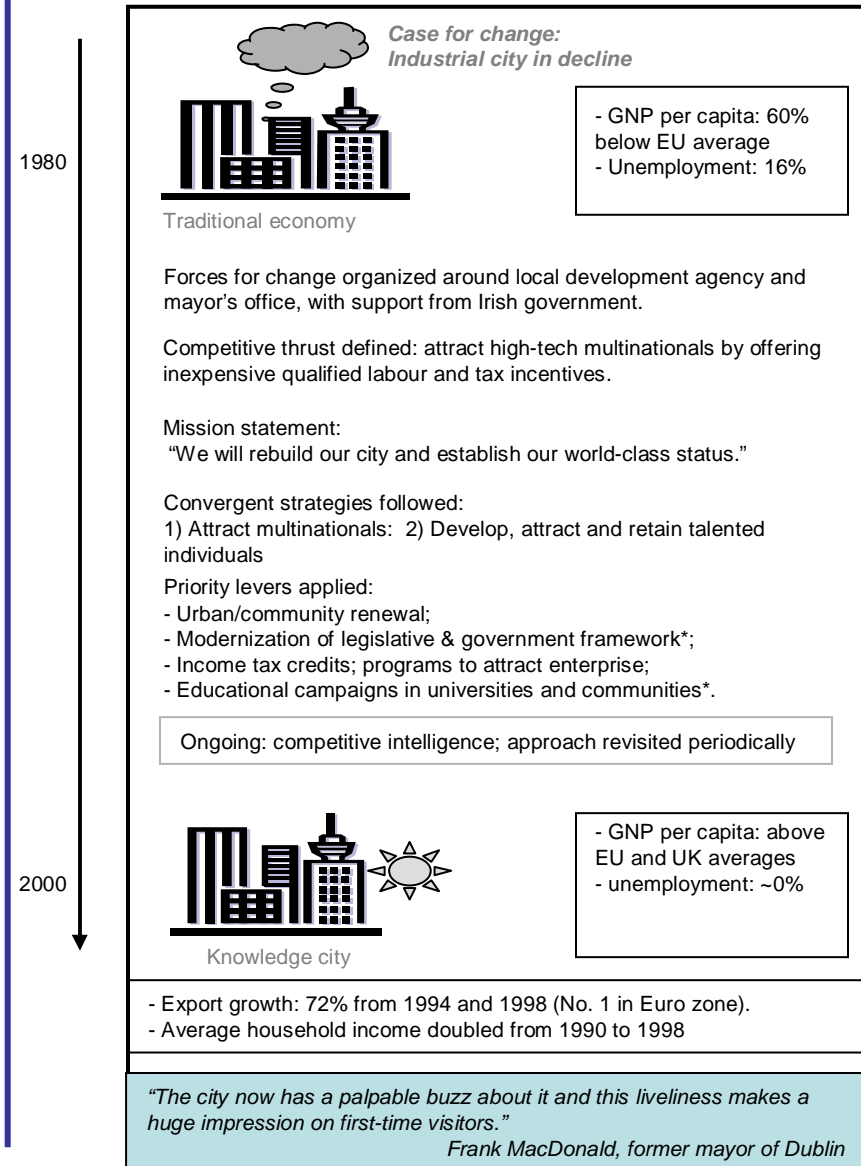
At the turn of the 1980s, the economic situation in Dublin, the capital of Ireland, was most unenviable: highly labour-intensive manufacturing industries, high unemployment, and a low level of schooling. The challenge of positioning Dublin as a knowledge city was a colossal one. The city succeeded in its transition via structured, systematic efforts, deployed in close collaboration with the Irish government, to attract high-tech investments and to ensure that its labour force was extremely well trained.

Dublin built on a specific advantage: Ireland's membership in the European Union. This gave it access to considerably large amounts of EU funding to aid in its transformation. EU membership also gave Dublin preferential access to multinational corporations, many of which were seeking to penetrate the European market and were in fact looking to do business in an English-speaking country. The Irish authorities also instituted a very competitive tax-incentive program, and Dublin invested intensively in manpower training and urban renewal.

The government of Ireland played a structure-enhancing, balanced role vis-à-vis the city of Dublin. Among other things, it issued powerful guidelines to support the transformations under way, in particular by inciting other cities in the country to follow Dublin's lead, and by promoting the creation of local development agencies.

Some cities overcome considerable handicaps in positioning themselves as knowledge cities; an example is Dublin.

Phases of Dublin's development



*Efforts originally undertaken in the 1960s

Among cities that have steered their transition to the knowledge economy in exemplary fashion, Singapore is in a singular position. In the 1960s this city-state embarked on a process similar to that followed by Dublin. Less than 30 years later, it had become one of the most dynamic economies in the world. Singapore began building its competitiveness by modernizing its port facilities. This was followed in the 1970s by the setting of a series of priorities:

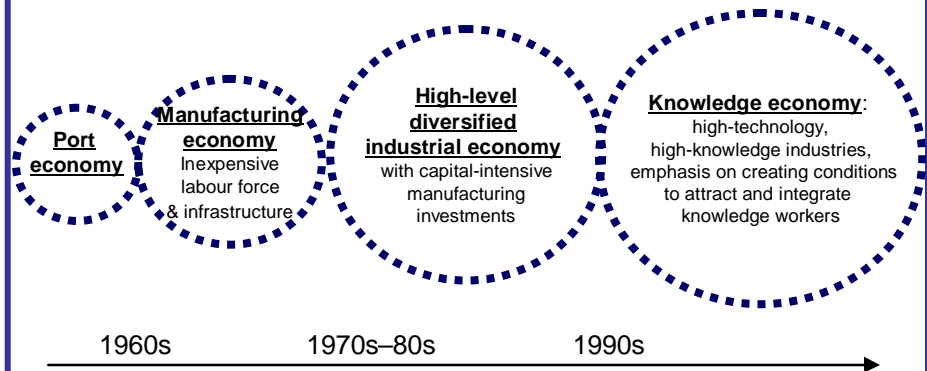
- Attract multinational companies by offering a flexible growth-oriented business climate;
- Progress to an accountable, competent municipal administration;
- Institutionalize strategic scenario exercises to weigh future options, so as to always remain a step ahead.

Today, Singapore is targeting biogenomics as a priority for the decade to come, and is investing massively in the field. True to its traditions, it has deliberately chosen a limited number of promising sectors in which it seeks to be the global leader. At the same time, it is continuing efforts directed at the IT and high-growth services sectors.

The approach developed for Singapore is in keeping with the traditional disciplined practices of Asian economic powers: constant analyses of strengths and weaknesses, opportunities for development, and active threats; prioritizing of selected areas of excellence; and introduction of measures to promote education as well as foster attraction and retention of competent, talented individuals from Asia and elsewhere.

Singapore's positioning has also been supported by an arts and culture strategy, articulated in part around international-calibre events celebrating both Eastern and Western artistic traditions. This led to the creation of the Singapore Lyric Opera and the Esplanade: Theaters on the Bay arts centre, which attracts performers from all over the world. A survey in the March 2002 issue of *The Economist* rated Singapore's quality of life higher than that of London and New York.

Other cities ensure that they remain constantly at the leading edge of knowledge, and always plan a step ahead. That is the case with Singapore.



Some facts:

- Island city-state barely larger than Montréal
- Population 4 million
- Standard of living and integration of technology in daily life on par with or superior to those of the U.S. and Switzerland
- 90% of the population has Internet access from home

- *Singapore is ranked by the World Economic Forum as Number 1 in global competitiveness.*
- *Forbes Global magazine rates Singapore second-best place in the world after the U.S. to do business*

Still with the objective of attracting and keeping talent, the government has instituted a program allowing prestigious universities to set up specialized graduate programs in Singapore while maintaining their identities and particular characteristics. Ten renowned universities now have campuses in Singapore, including INSEAD (MBA program), Massachusetts Institute of Technology, the Chicago Graduate School of Business, and Technische Universiteit Eindhoven.

Singapore's appeal as a knowledge city is many-faceted. Life there is keyed to the fast pace of scientific and technological advances, as well as cultural renaissance, and the city also derives considerable advantage from its centralized South-East Asian location, a few hours' flying time from the Pacific islands.

The role of the private sector

Other cities have favoured a more organic approach, in which partnership between the public and private sectors is vital and leadership by the private sector is a driving force. Dublin, mentioned earlier, is one such city; Austin, Texas, is another paradigmatic success story. A relatively unknown, unstimulating small city in the 1980s, it now occupies the top rungs on global indexes of knowledge cities, ranking second on Richard Florida's creativity index and sixth on his innovation index. It also places third among knowledge economies, according to the 2002 World Knowledge Competitiveness Index, which studies 300 cities around the world.

Today, Austin is THE destination for U.S. knowledge workers specializing in information technology. Its radical transformation, effected in less than 20 years, is the outcome of a long-term municipal strategy reaching back to the 1950s. Having decided to draw clean industries to the area, the city developed a plan to attract large corporations by touting its cost of living — lower than that of major U.S. cities — and the quality of its university graduates in engineering and technology (Austin is the seat of the University of Texas).

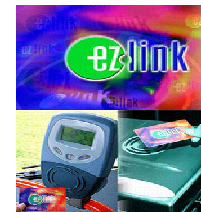
Singapore seeks to ascribe value to its symbols of knowledge and innovation in a wide variety of ways.

Genome Institute of Singapore (GIS), inaugurated in 2000

By the end of 2003, the Biopolis — a 180-hectare biomedical city within the Buona Vista Science Hub — will be home to the GIS. The GIS building will be adjacent to other biomedical institutes, such as the Singapore Institute of Molecular Biology, the Bioinformatics Institute, the Institute of Biomedical Engineering, the BioTechnology Center, the Biomedical Research Council and regional and multinational industrial R&D organizations. The Biopolis provides an environment conducive to the exchange of knowledge and collegial interactions. It was planned as a complete community that supports living, working, learning and playing.



At right, an illustration of a contactless general-purpose smart card for mass transit. (Users wear the card in their clothing or handbag, within range of a detector. The fare is deducted from the card and the balance remaining is displayed on the detector.) The card has multiple commercial applications.



The city attracts prestigious universities, which set up campuses to promote influx of foreign students:

INSEAD's sister campuses in Europe and Asia provide world-class facilities and resources for our students, faculty and staff. Located by the tranquil forest of Fontainebleau and the bustling city of Singapore, our visitors enjoy the best of both worlds - stimulating external environments and an on-campus experience that is uniquely INSEAD.



Later, in the 1980s, Austin undertook to redevelop its urban and cultural life, with a view to attracting and retaining talented individuals. This was accompanied by a systematic effort to develop research capabilities in technology and computer science at the University of Texas (funded in large part by the State of Texas and the federal government). City administrators played a significant role in the creation of Dell Computers and the arrival of IBM in Austin. Thanks to their efforts, the city was also able to attract Intel and Motorola. The presence of all these companies is a powerful catalyst for Austin's flourishing as a knowledge city.

This set of converging strategies, put forward in the Austin 20/10 Plan, drafted in 1980 by the municipality, the local chamber of commerce and the business community, have set Austin on an enviable course.

Austin's growth over the past 20 years can mostly be explained by:

- Significant private-sector investments (e.g., IBM, Intel, Motorola) stemming from efforts conducted jointly by private-sector players and the municipal administration: the mayor and business community leaders led joint missions to high-tech-intensive areas such as Silicon Valley to pinpoint practices of excellence and target companies deemed to be a good fit for Austin;
- Significant support from the public sector (municipal, state and federal governments).

On the technology front, Austin has attracted not only renowned firms, but also two major research consortiums: MCC (Microelectronics and Computer Technology Corporation) and SEMATECH (Semiconductor Manufacturing Technology). The municipality worked hand-in-hand with leading figures in the regional private sector to create an exemplary entrepreneurial climate and an open, flexible interface between government and business. It also works to promote networking among individuals as one of the Austin's intrinsic values, thus encouraging communication among different sectors of society and fields of innovation.

Some cities put forward a set of convergent strategies marked by strong leadership shared between the public and private sectors.

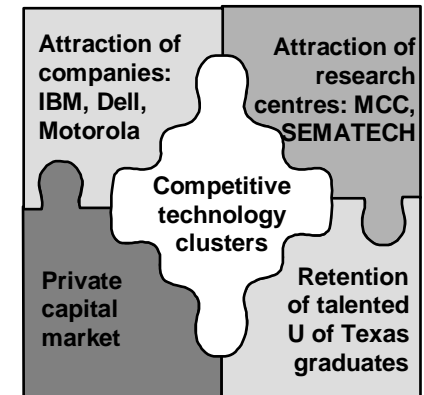
Some facts:

- 780,000 inhabitants, population growth 48% from 1990 to 1999
- 38% of private-sector employment in high technology; highest growth rate in the U.S. (more than 80% in 10 years)
- Increase in average wage (private sector) of 65% from 1990 to 1999; highest in Texas
- 4th most affordable U.S. city for workers in information and communication technology; wage differential of US\$18,000 compared to the San Francisco area when cost of living factored in



Distinguishing factors:

- Access to high-tech research and companies in an attractive setting at a lower cost than Boston or Silicon Valley
- Strong spread across key knowledge-based economic sectors: 1) IT- and computer-related manufacturing; 2) Instrumentation and electrical machinery; and 3) Communications and computer services and R&D.



Austin also stands out as a music city, stimulating development of new avenues of creativity and innovation. The city makes ongoing investments in development of a distinctive musical platform (as a capital of live music) and in the quality of life it offers knowledge workers:

- Novel performance genres with strong new-technology content;
- Public squares that promote informal exchanges and networking;
- A relaxed lifestyle, with arts and culture accessible to all;
- Strong ties between artists, the business community and government to encourage and reward musical innovation and avant-garde techniques.

To sum up, Austin stands out as an attractive destination for knowledge workers because of its well-developed urban and cultural fabric, diversity of cultural and social stimuli, openness to diversity and efforts to preserve its authenticity, its unique cultural assets and its ethnic diversity. The cost of living is also relatively low, as is urban congestion, adding to the city's advantages.

Success factors common to all the cities

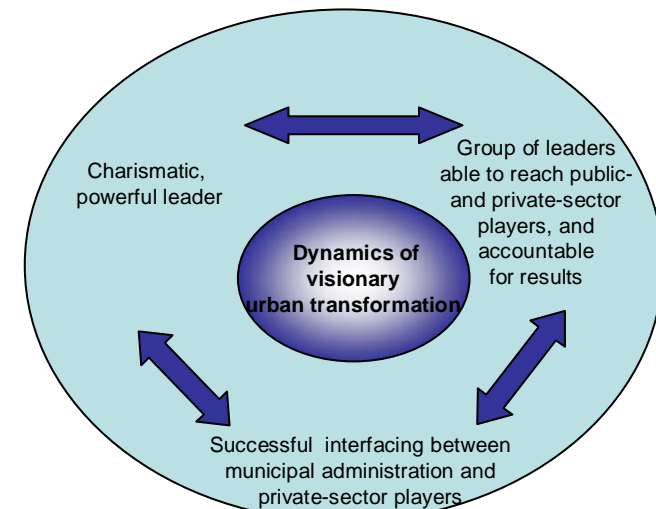
The majority of the cities that seek to position themselves as knowledge cities go through the same stages: in-depth analysis of the situation, definition of a vision and strategy, implementation of action plan with particular attention paid to fundamental aspects such as regeneration of traditional infrastructures and investment in technology infrastructures.

But there are some specific conditions for success that are shared by all.

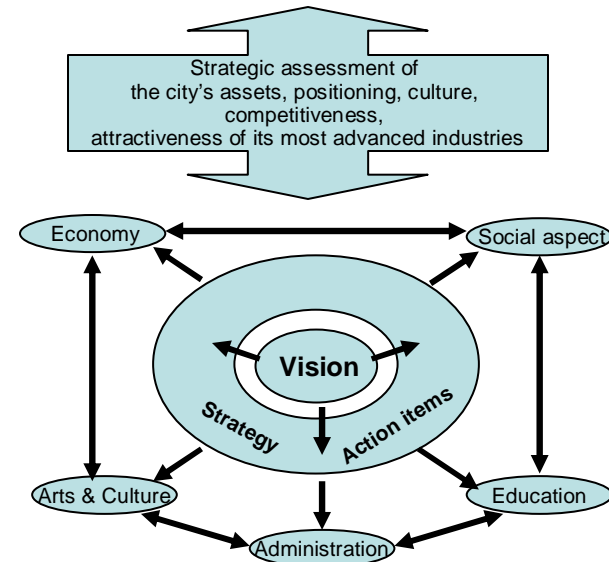
The first has to do with a **sense of urgency**. There must be belief in the necessity for change. Cities that have undertaken major repositioning efforts in the knowledge era have done so in response to difficult situations, e.g.:

Cities that stand apart share common success factors

Establish a coalition for change



Target opportunities for value creation and develop detailed strategies



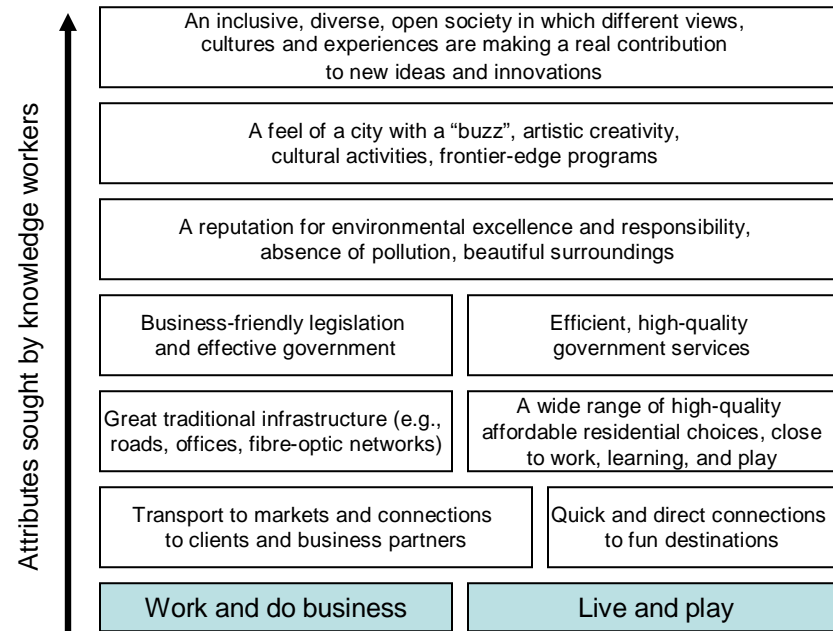
- The decline of their key industries (industrial sector in Dublin and Lyon, the end of military contracting in San Diego, the dissolving of Eastern European markets in Stockholm);
- Scarcity of local resources (e.g., raw materials are absent in Austin, Singapore, Seattle and Stockholm);
- Depreciation of the downtown core in favour of the metro region (Boston, San Francisco, Chicago, Denver).

A second success factor is the **frontline role assumed by local players**. It goes without saying that a city cannot succeed without clear support from higher levels of government, but it is also true that it cannot achieve significant results without assertive actions from the local leadership.

In Stockholm, for example, institutions of higher learning have, since 1998, clearly defined accountability with respect to local and regional economic development, and take part in the founding of new companies. In addition, in most cities' private-sector players have a front-line role in defining and implementing vision and strategy. The private sector was closely associated, for instance, with the renaissance of cities like Lyon, Barcelona and Austin.

A third condition for success is **targeting of opportunities and consistency in the implementation of strategies**. Community leaders in top-tier knowledge cities have typically chosen to target a few sectors only, but set ambitious goals for each, aiming at nothing less than global leadership. They have also sought to balance the interests of the chosen sectors against available resources and the competitiveness of the metropolitan area. Lastly, they have placed great stock in development of a quality system of higher education, enviable quality of life, and progressive social principles.

Top-tier knowledge cities have all invested massively in the basic prerequisites for an expanding knowledge-based economy: anything that helps knowledge workers live, work, and play.



These cities have also relied on consistent application of their vision and strategy. In Dublin, for example, any new initiative must dovetail with the urban strategy. In Stockholm, all new development projects must be in line with one of the four key sectors in which the community has chosen to excel (information technologies; new media and the Internet; biotechnology and biomedicine; and environmental technologies).

The fourth condition for success involves **strong financial investments and sustained pursuit of goals** so as to promote marked and sustainable changes. The investments are considerable and long-term. They are supported by visionary leadership, expressed over a long period. All of the cities studied by the Committee have obtained maximum leverage from public and private financial resources, by applying various tax schemes, but also by attracting public funding at the national and supra-national levels.

These cities have also taken steps to ensure that the basic factors conducive to the development, attraction and retention of knowledge workers are present for the years to come. Denver invested US\$3 billion to redevelop its downtown core, while Boston has spent US\$60 billion in urban renewal and global-connectivity improvements to its mass-transit system. Similarly, massive investments have been made over the past several years by Barcelona, Lyon and Dublin.

Lastly, the success of these initiatives is also dependent upon efforts to ensure that **day-to-day existence in these transformed cities is efficient and pleasant**. In Barcelona and Boston, particular care has been taken to preserve the distinctive character of heritage districts. Foreigners who come to Barcelona to do business are provided with an office equipped with a computer and Internet connection.

Successful knowledge cities also develop smart projects to be recognized as practising sustainable development, a factor valued by knowledge workers.



“Earth, water, air and light meet”
Hammarby Sjöstad Project, Stockholm

- Green redevelopment of a run-down port and industrial area as part of larger Environment 2000 program
- Fruit of a shared vision between public authorities, property owners and promoters

Cities that successfully make the transition to the knowledge era also invest in effective e-government initiatives. Dublin, for example, has set up one Web-based service for individuals and another for businesses. Boston began a successful transition to e-government a few years ago when it set up Web solutions enabling citizens to pay for traffic violations and make permit requests online.

As well, the cities studied pay particular attention to sustainable social and ecological development. Stockholm in particular excels in this regard. Denver has created a mile-long pedestrian-only zone in its downtown core. Barcelona has set itself the goal of allowing pedestrian access throughout the city and ensuring its remarkable beauty endures. In 2001, Taiwan mapped out a strategic plan to become a “green silicon island.” The plan is built along three main thrusts: a knowledge economy, sustainable environmental development, and a welcoming society.

To sum up: cities that succeed in the knowledge era invest massively in strategies to make themselves attractive in the eyes of knowledge workers.

Cities that succeed in the knowledge era build on the multiple assets that a post-industrial society offers.

- *Cities that have successfully achieved major transformations have done so through intensive investments made over a period of at least 20 years.*
- *Five success factors distinguish the top-ranked knowledge cities:*
 - 1) *Sense that urgent change was necessary;*
 - 2) *Front-line role assumed locally by both public- and private-sector players;*
 - 3) *Exploiting of targeted development opportunities; consistency in the implementation of strategies;*
 - 4) *Massive state investment and sustained pursuit of goals;*
 - 5) *Focus on the basic prerequisites for growth in a knowledge economy: i.e., everything that allows knowledge workers to live, work and play.*

KNOWLEDGE CITIES: AN OVERVIEW

2.1 IDENTIFYING SUCCESS FACTORS FOR CITIES

***2.2 A FOCUS ON STRUCTURE-ENHANCING IDEAS
IN VARIOUS FIELDS***

2.3 “FAILURE FACTORS” MUST NOT BE IGNORED

2.2 A FOCUS ON STRUCTURE-ENHANCING IDEAS IN VARIOUS FIELDS

By analyzing the initiatives taken by successful knowledge-based cities, one can pinpoint a number of practices notable both in their simplicity and in their potential for value creation. Four of these merited the Committee's attention in particular:

- Building of comprehensive, high-quality Web sites;
- Creation of "microcosms de creativity";
- Establishment of spaces for ongoing societal dialogue;
- Alliances among knowledge cities.

Comprehensive Web sites

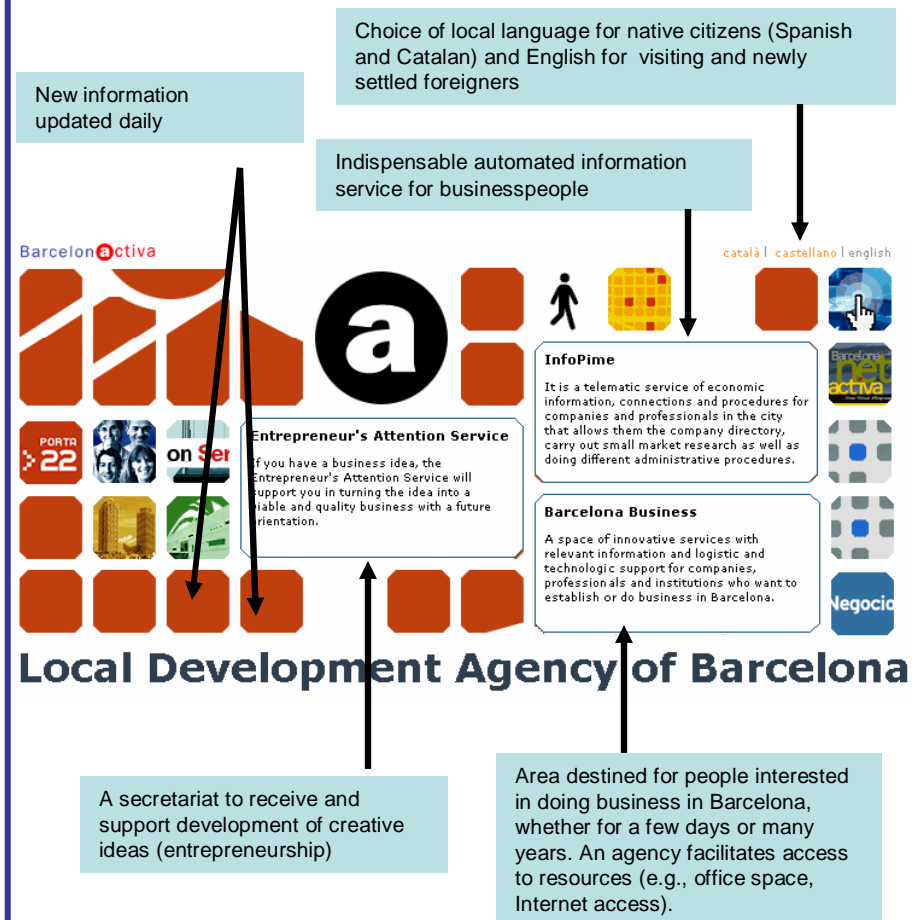
The top-ranked knowledge cities in the world have all deployed comprehensive, lively and stimulating communications tools to convey their messages. Their Web sites are the most visible examples.

Here are some distinguishing features:

- A single portal, rather than several sites for the various municipal or regional bodies. The site administrator is usually the local development agency or regional chamber of commerce.
- A targeted client base, rather than a vague group of citizens. The typical target client is a knowledge worker who has recently settled in the city and is seeking a wider range of information than one who has been living there longer. Beyond ongoing training initiatives, for example, this information may include an entertainment calendar, a focus on strong trends in local high-tech industries, or on ways of taking part in city life, information about income taxes, working visas and so on.
- A site oriented toward global concerns of knowledge workers, rather than excessively specific information.
- A modern, visually appealing site, responding to so-called usability criteria (stimulating browsing experience; concise, relevant texts).

A knowledge city's creativity and appeal are reflected in the quality of its Web site.

Illustration of Barcelona's Web portal



Source: www.barcelonactiva.com

- A site that holds many possibilities for access to information, with links to other well-designed sites. Such sites are always rich in information and offer many levels of browsing.

Singapore's Web site, for instance, has all these features. It is amusing and stimulating. It is managed by the Economic Development Board of Singapore, which is mentioned only in the header. The most important aspect is the logical structure of the information provided for knowledge workers: making career choices, deciding to move to Singapore, preparing for the move, arriving in Singapore, information about what the country has to offer in terms of employment, innovative facilities, living and entertainment, etc. Each section provides detailed up-to-date information and contains links to many related sites. It is a vibrant, comprehensive site that offers many possibilities.

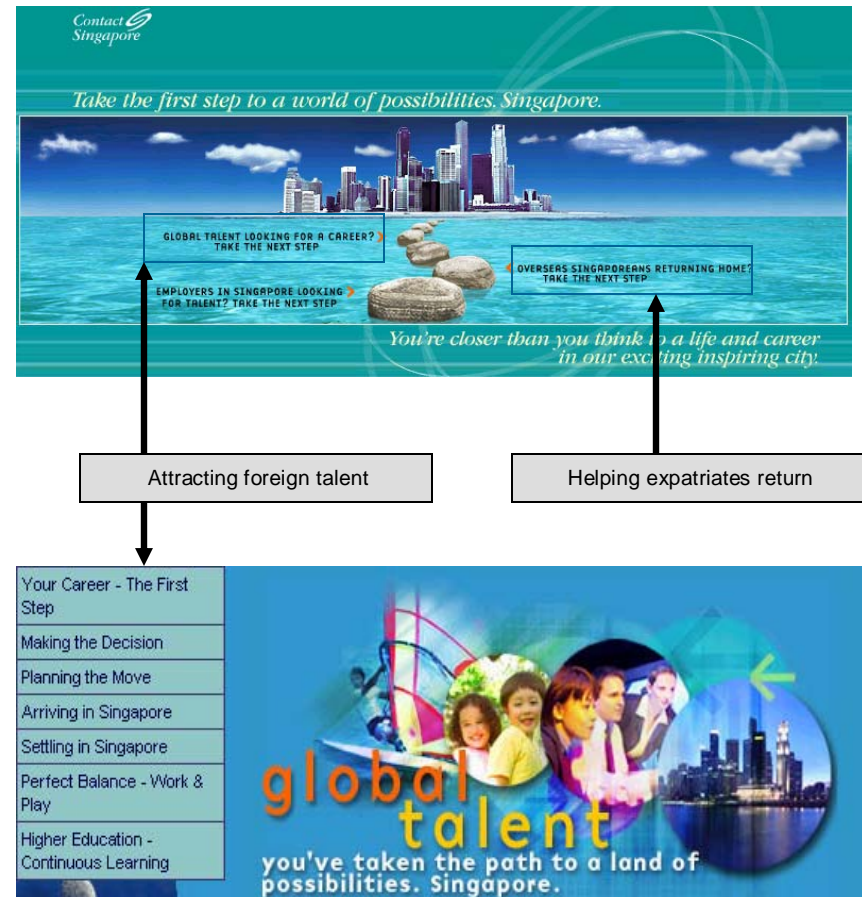
Microcosms of creativity

Following the successes achieved by major industrial areas such as Silicon Valley, the North Carolina Research Triangle Park and Route 128 in Boston, cities are now making an effort to re-create, in their downtown cores, the factors that helped these areas achieve their goals.

Microcosms of creativity are therefore being established around the biosciences and communications technologies, as well as other promising fields. They often involve both private-sector players and community organizations as well as a significant contribution from local institutions and municipal and regional governments.

Cities design Web sites tailored to provide knowledge workers with the specific information they are seeking.

Case study: Singapore's Web portal



Source: www.contactsingapore.org.sg/global_talent/gtindx.htm

Toronto's MaRS centre is an excellent example of this type of project. It is a physical environment run by a non-profit organization to promote research and facilitate the marketing of services and products in the medical field and related sciences. Yet another example is the Digital Hub in Dublin, which is involved in regenerating historical areas to facilitate new connections among residents, media experts, businesspeople, and so on. The development of these small hubs of creativity is based on three assumptions for success:

- Shared challenges and objectives or similar problems to resolve. The aim is to avoid all artificial cohabitation of people who do not share that many similar values or goals.
- A process of innovation driven by informal networking. The objective is to develop a natural environment for the exchange of ideas, providing a forum in which people with very different background and areas of expertise come together.
- An open definition of players who can participate, as there are many different areas in which various types of knowledge can intersect fruitfully.

Toronto built on the integration of history and technology in creating the MaRS project. It is located on a site (a wing of a university) that is part of the city's medical research heritage. The project has also highlighted the integration of different areas of expertise; it organically teams researchers, clinicians, financiers, communications experts, pharmacists and lawyers. The physical space is flexible enough to accommodate growth and changes within the organizations; this architectural principle is becoming increasingly popular worldwide.

Cities are establishing "microcosms of creativity" in their downtown cores using the factors that have made such innovative models as Silicon Valley a success.

Characteristics of the MaRS (MARS Discovery District) centre in Toronto



"The global research is absolutely clear: innovation, competitiveness and prosperity arise out of the tight geographical agglomeration of highly skilled human capital. They don't cluster randomly, but are drawn by a fertile environment for their work. MaRS can be a critical element of the draw that makes Toronto a magnet for the future of medical and related sciences."

Roger Martin, Dean, Rotman School of Management, University of Toronto

MaRS establishes an internationally recognized new technology convergence centre and facilitates the emergence of exciting new businesses in the heart of the medical research community of Toronto.



Example of the Digital Hub area in Dublin



The Digital Hub is situated in an already vibrant community in the historic core of Dublin City. The Liberties/Coombe area has a tradition of industry and trade and is one of Ireland's oldest urban communities.

The Digital Hub has an abundance of innovative projects. Below is a description of a recent project that combines heritage development with children's education and the use of new technologies.

"Storytelling in the Liberties" Web site hosts 210 stories, all produced by school children from the Liberties area. The project was designed to develop and enhance the Liberties' oral tradition of storytelling through the learning of new digital audio-visual skills and production processes.

Source: www.thedigitalhub.com/storytelling

"The real beauty of this project lies in its simplicity. Storytelling ranks amongst the oldest forms of entertainment in Ireland, and here in the Hub they are recreating that very simplicity, yet marrying it with new technologies."

Minister Mary Hanafin

Permanent spaces for societal dialogue

Some knowledge cities have instituted procedures, which are part of predetermined and permanent participatory spaces, in an effort to mobilize residents.

These spaces provide a forum for ongoing reflection on the current and future challenges facing the city, and give the public a chance to express their points of view. The areas for debate primarily provide an opportunity to assess the advantages and disadvantages of ongoing projects, thereby allowing for specific adjustments. Examples of such participatory structures are the Strategic Planning Association of Barcelona and the Conseil de Développement de l'Agglomération Lyonnaise (Greater Lyon board of development).

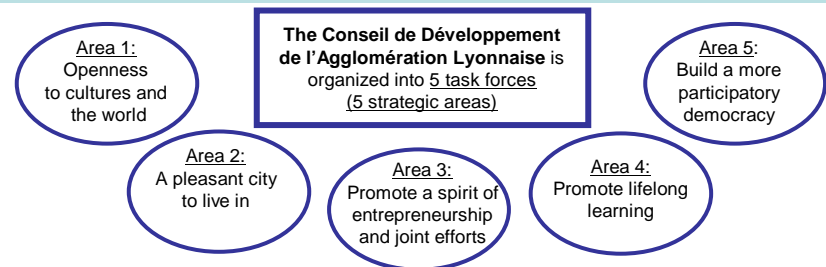
These participatory structures are run in close collaboration with an executive committee or a development board, which is in charge of prioritizing the most interesting ideas, based on the city's overall strategic orientations, implementing them and establishing criteria with which to evaluate selected projects. Although these executive bodies are restricted in their makeup, members consist of representatives of the key areas of activity in the region. For instance, the executive committee of the Barcelona Strategic Planning Association is made up of representatives of the institutions that founded the Association. They include the City of Barcelona, the Chamber of Commerce and Industry, the Port of Barcelona, the Trade Fair and Exhibition Centre, the general workers' union and the university. In the case of Greater Lyon, the development board permanently manages five task forces that consist of representatives of consular chambers, universities and research centres, local communities, professional unions, and businesses.

These permanent participatory spaces for dialogue are organized around a mutual vision and shared objectives. General overall co-ordination is provided by a small team responsible for operations and logistics, which works in close co-operation with or is controlled by the municipal administration.

Some cities have successfully leveraged the benefits of participatory dialogue with all community stakeholders.

Lyon: A metropolis implementing participatory democracy

- **Action plan for a technopolis** including joint actions, circulation of information, shared evaluation, rules and active partnership with all stakeholders: e.g., consular chambers, universities and research centres, local communities, professional unions, businesses.
- The **Conseil de Développement de l'Agglomération Lyonnaise (Greater Lyon development board)**, is in charge of:
 - Ongoing, shared dialogue on all major issues;
 - The promotion of public debate based on the charter on public debate;
 - Consultations on the urban agglomeration project, its implementation and its evaluation.



Barcelona: The method matters as much as the outcomes

The mission of **Barcelona's strategic planning association** is to:

- 1) Develop and lead the process of strategic planning;
- 2) Promote and disseminate the culture and methodology of strategic planning as an instrument for encouraging citizens to take part in economic and social development.

General council (participatory structure of the process): 215 representatives of key organizations and institutions, chaired by the mayor of Barcelona

Executive committee, whose role is to:

- Formalize the contents of the strategic plan;
- Define performance indicators; and
- Identify which institutions will be responsible for implementation of the priority actions.

General co-ordination is provided by a person designated by the mayor and a team of four people.

Outcome:
mobilization of the entire system of stakeholders—
1.6 million residents and more than 200 institutions involved in developing and implementing the strategy.

Austin: A strategic networking approach

"The Austin Network is not a new organization — Austin doesn't need a new organization. It does not try to duplicate the important work established by existing groups. It is, instead, a network of networks; a connector of people, institutions and resources. It facilitates the collaboration of teams of entrepreneurial stewards to do serious work on serious issues." Peter Zandan, CEO of Pazzaz & Chairman of Zilliant

Alliances of knowledge cities

Over the past few years, several think tanks have been created in the United States to reflect on the roles of cities in the knowledge era.

CEOs for Cities, which is described on the opposite page, is one of the efficient networks that has been set up as a result.

The quality criteria required of efficient networks of knowledge cities include:

- Alliance of cities of similar sizes and aspirations;
- Combination of private, public (municipal and community) and academic perspectives;
- Active presence of influential stakeholders: corporate leaders, chairs of organizations and mayors are actively involved, they do not delegate;
- Specific attention to the quality of information: the cities pool their resources to conduct rigorous studies and analyses and ensure their actions are based on facts;
- Frequent meetings of subgroups that share similar interests and develop networks for sharing efficient and relevant experiences;
- Support for initiatives based solely on thoroughly verified information and strong trends.

CEOs for Cities focuses primarily on 1) gathering information on the competitiveness of cities; 2) studying trends in economic models and paradigms for city change; 3) drafting public policy documents likely to help its members in their lobbying of major issues before the U.S. government.

Several networks have been created in North America to reflect on the new sources of competitiveness among cities. Some of these networks stand out for the quality of their content and in-depth debates.

Paul Grogan, an urban expert and a vice-president at Harvard, and the author of *Comeback Cities*, pulled together a group of mayors, corporate executives, university presidents and others, called CEOs for Cities, a national organization that focuses on building the economic competitiveness of cities and that constantly draws on the broad perspectives of government, business and universities.

CEOs for Cities recruits its principals, by invitation only, from among the leadership of public, private and non-profit organizations in major U.S. cities. Leaders are **recruited in "clusters," including a mayor, corporate CEO, university or college president, and nonprofit leader from each of the 15 member cities.** The "leadership team" includes, among others, Richard Daley, Mayor of Chicago; Dr. George Rupp, President of Columbia University; Thomas Menino, Mayor of Boston; and Norm Coleman, Mayor of St. Paul.

The think-tank commissions studies and sponsors meetings that allow member cities to learn from one another and adapt competitive principles to their realities.



[home](#) > [research](#) > [federal policy](#) > [competitive cities - a new urban agenda](#)

Competitive Cities: A New Urban Agenda

CEOs for Cities, Spring 2001

CEOs presented this federal policy position paper to President George W. Bush and the 107th Congress. The paper proposes that the federal government rethink its relationship with cities based on new trends and opportunities in urban areas that have helped to lead cities on a comeback. The report proposes specific investments and incentives, as well as a realigned role for the federal government to better respond to and nurture innovative and entrepreneurial activities at the heart of this comeback. Spring 2001.

The Eurocities group plays essentially the same role in Europe. The organization, which was originally constituted in 1986 around six European cities (Barcelona, Birmingham, Frankfurt, Lyon, Milan and Rotterdam), is currently the biggest network representing large cities in Europe, with 113 members. It is renowned for the quality of its expertise and is consulted regularly by European institutions.

Eurocities has three objectives:

- Ensure that urban affairs are placed high on the European Union's policy agenda.
- Promote transnational co-operation projects among its member cities across Europe.
- Encourage members to share their experiences and to create networks among Europe's large cities.

Lyon remains the leader of the organization. Since December 1998, the city has been leading a task force on development strategies for European metropolises. The work of this task force is part of Lyon's Millennium 3 approach. It is using these projects to institute a new form of co-operation among the members of the Eurocities network.

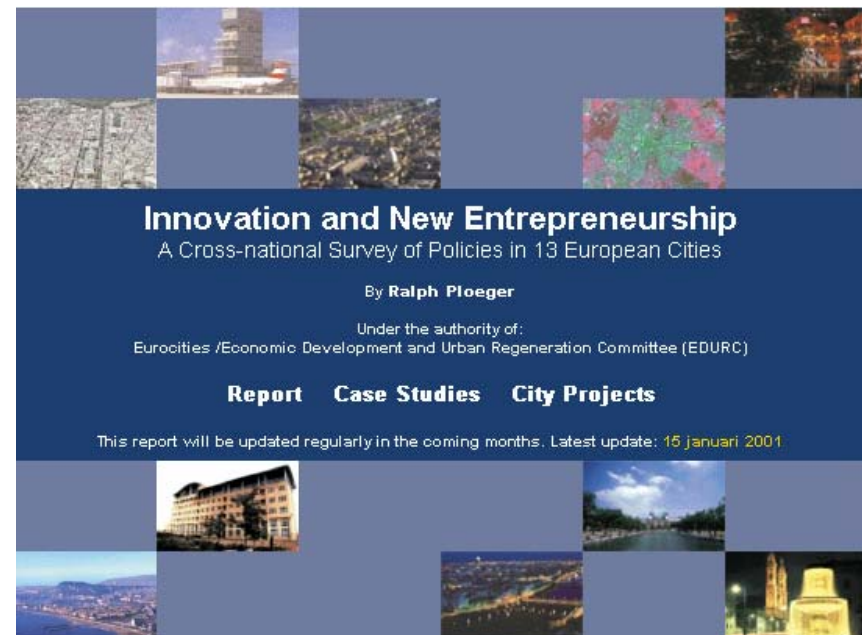
Elsewhere in the world, cities are seeking to reproduce these successful models and are focusing on fields of work that will help improve their competitiveness in the knowledge era.

In England, for instance, several major cities have joined forces to set up the Core Cities network. Together, they commission studies and strategy documents. The Core Cities movement is co-ordinated by local municipalities in conjunction with a large variety of local private, public and community organizations. Member cities organize annual conferences during which they share experiences and all stakeholders are invited to play an active role.

The Eurocities network has been conducting such activities in Europe since the end of the 1980s.

"I have always believed that the next 15 years would be decisive ones for major cities such as ours. In Europe, there will be an emergence of a dozen or 15 cities. They will emerge on the economic, cultural and intellectual level and our city must be on the list of major centres that expand their international scope. "

G rard Collomb, Mayor of Lyon, 2002



KNOWLEDGE CITIES: AN OVERVIEW

2.1 IDENTIFYING SUCCESS FACTORS FOR CITIES

*2.2 A FOCUS ON STRUCTURE-ENHANCING IDEAS IN VARIOUS
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2.3 “FAILURE FACTORS” MUST NOT BE IGNORED

3.3 “FAILURE FACTORS” MUST NOT BE IGNORED

Professor Richard Florida has coined the term “institutional sclerosis” to describe urban centres, such as his native Pittsburgh, that fail to successfully make the jump to a knowledge city. Pittsburgh launched major projects to transform heavy industries in its surrounding regions into clean industries. The city invested in a new airport and ultramodern sports stadiums. Surveys still rank Pittsburgh high among U.S. cities in terms of quality of life.

Unfortunately, the economy has been stagnant for several years and businesses are slowly but steadily moving out of the area. Even more serious, the population is continuing to decline, especially as well-trained young people move to other centres.

According to Richard Florida, Pittsburgh needs to pay special attention to the expectations of knowledge workers. City managers are taking all the steps that have been successful traditionally. Although useful, these measures are not sufficiently effective.

Pittsburgh has focused primarily on renovating its airport and on the traditional tax-incentive-type assistance to businesses setting up in the area. The city has done very little to highlight the efforts at lifestyle enhancement that its local agents have made. Many of Pittsburgh’s attractions, such as the Andy Warhol Museum, do not feature in the current strategy.

Other cities have also made considerable efforts, but often in the wrong direction. This is the case of Baltimore. The city decided to focus on tourism rather than follow the lead of Boston; i.e., develop a dynamic industry around an international-calibre medical institution (in this case, Johns Hopkins Hospital and Health System). The strategy has been successful in some ways; e.g., redevelopment of the port area.

The overall economy of the city is stagnating, however, and even though many jobs have been created, they are mostly in the traditional service industry, are low-paying, and have a high workforce turnover rate.

Failure to successfully transform a city is often linked to a poor grasp of dominant trends.

the warhol



Pittsburgh has invested heavily in the renovation of its airport and in traditional ways of attracting business. However, it has not been highlighting assets valued by knowledge workers, such as the Andy Warhol Museum.

Baltimore offers the kinds of entertainment opportunities sought after by knowledge workers; however, it has failed to capitalize on development of Johns Hopkins University, which was the first world-class university research centre in the U.S.



The impact of historical accidents on the prosperity of a city cannot be neglected either. For example, in spite of all the efforts made in Cleveland, restructuring and mergers of multinationals led to a decline in the number of major head offices located in the city in the 1990s, causing a collapse of the local economy that is still felt today. Conversely, the downturn in high-tech stocks in 2000, combined with an increase in costs in Silicon Valley, has largely benefited the development of the city of Denver.

Artificial or incomplete change often leads to failure.

Some characteristics of failures

- Artificial nature of redesigned districts; focus is solely on tourism and not knowledge; artificial integration of residents and knowledge workers.
- Artificial nature of the new infrastructures aimed at promoting technology clusters; spaces shared by people who are not conducting the same type of R&D or working on similar strategic issues; predetermined selection of specific sectors with no consideration given to the increasingly multidisciplinary nature of knowledge areas.
- Excessive attention to infrastructures of the past, such as sports stadiums.
- Too little focus on the intensity and quality of knowledge flow: little valuing of institutions such as university hospitals; artificial or incomplete development of cultural heritage.
- Excessive focus on attracting businesses; too little on attracting knowledge workers.

SPEEDING MONTRÉAL'S TRANSFORMATION

3.1 ESTABLISHING PRIORITIES

3.2 ENSURING THAT CONDITIONS FOR SUCCESS ARE IN PLACE

"A town is not simply an agglomeration of individuals and equipment; it is a state of mind."
Robert Park, U.S. sociologist

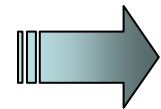
"A city has collective feelings."
John Steinbeck

In this section, the Committee describes the fundamental elements that should serve as a basis for the priority actions Montréal needs to take in order to assert itself as a knowledge city.

In the previous sections, the Committee focused mostly on the attributes of a knowledge city in terms of quality of life, in particular its cultural dynamism.

Major urban centres must also have a sufficiently large pool of jobs to attract knowledge workers. The high-knowledge job market must be rich and flowing, thereby facilitating lateral moves and cross-fertilization of ideas; the jobs available must be linked to high-calibre projects or ones that have international scope. This requires maintaining a diversified economy while specifically cultivating a limited number of niches of excellence that will draw in talented individuals from all over the world and provide a sustainable engine for economic growth.

To make its mark as a knowledge city, Montréal must also focus on the quality of its educational institutions. The better the quality of its colleges and universities, the higher the calibre of candidates it will attract worldwide. This will also help strengthen its reputation as a knowledge city.



3.1 SETTING PRIORITIES

Obviously, in the current age of knowledge and globalization, Montréal is in direct competition with metropolises all over the world. Safeguarding and strengthening its status as a knowledge city hinges on maintaining the proper focus on its distinctive assets.

Earlier in this document, the Committee focused extensively on the need for Montréal to strive to improve its processes of innovation, development of human capital, and immigration. These issues are vital for several reasons:

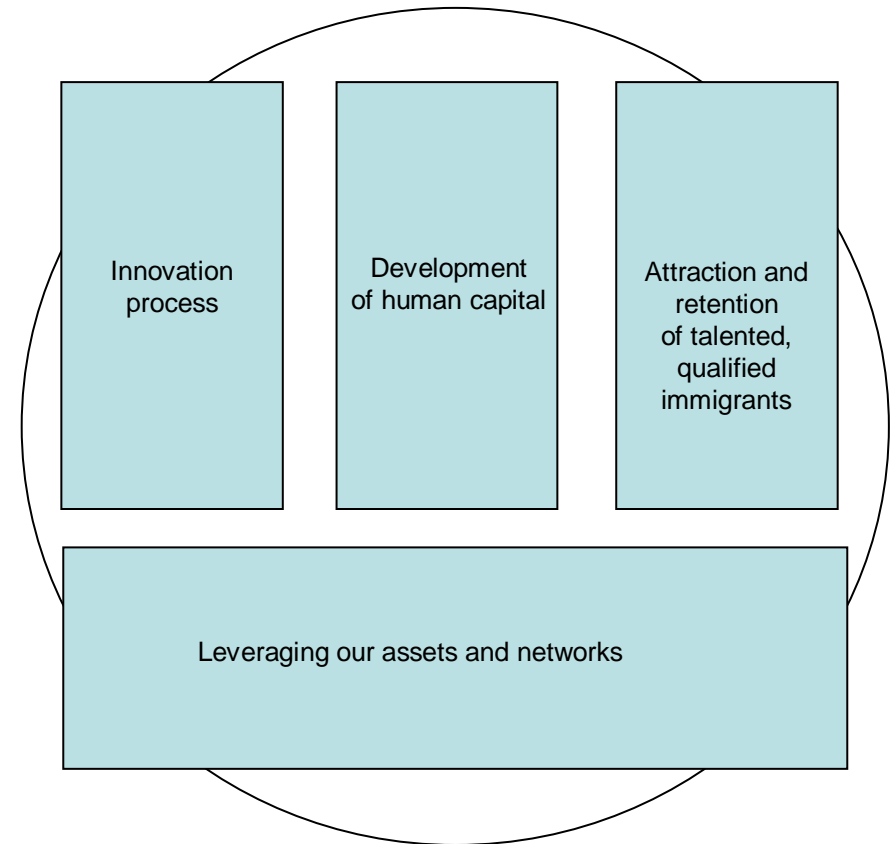
- They are linked to short-term requirements and the conditions for long-term success.
- They have a multiplying effect: improving the situation in the three areas will help grow and expand the culture of creativity in Montréal.
- They call on higher levels of government to participate and require strong local leadership from both the private and public sectors.

As has been extensively mentioned in this document, higher levels of government also have a vital role to play, for example in terms of fiscal policies and e-government initiatives. Regarding the latter issue, pilot e-projects can be carried out over the short term in Montréal. We believe these projects have every chance of achieving immediate success.

It is important to stress that the priorities identified by the Committee and by all the knowledge-based communities interviewed are clearly in line with the orientations of higher levels of government. The governments in both Ottawa and Québec City recognize the vital role that knowledge plays in the increasingly competitive world economy.

Montréal must address four priority issues if it is to safeguard the assets it has acquired as a knowledge city and strengthen its overall position.

Four priority areas for Montréal as a knowledge city:



These areas are interdependent. They have a ripple effect on one another.

The priorities set also dovetail with the recommendations of the Montréal Summit. Several proposals and courses of action mapped out at the Summit focused on:

- Integration of immigrants;
- The fight against poverty and school drop-out rates;
- The need to invest in high-tech industries (e.g., complex for research and spinoffs in nanoscience and nanotechnologies, West Island centre for life sciences, Greater Montréal Bio-Health District);
- Montréal's international reputation (e.g., *Cité étudiante internationale*); and
- Enhancement of Montréal's assets and networks, neighbourhood by neighbourhood, to promote a close-knit, knowledge-driven society that is accessible to all (e.g., development of the library network).

The issue of knowledge is also tackled in one form or another in the various strategic plans and policy statements issued recently by the City of Montréal.⁵ It is to be hoped that the issues are also being addressed in recently begun exercises.⁶ The Committee firmly hopes that the notion of knowledge city will be a vital component in the City of Montréal's strategic plan for 2004.

In short, it is fully in the interests of Montréal to capitalize on the momentum at the local, provincial and federal levels so as to fulfil its mission of a knowledge city.

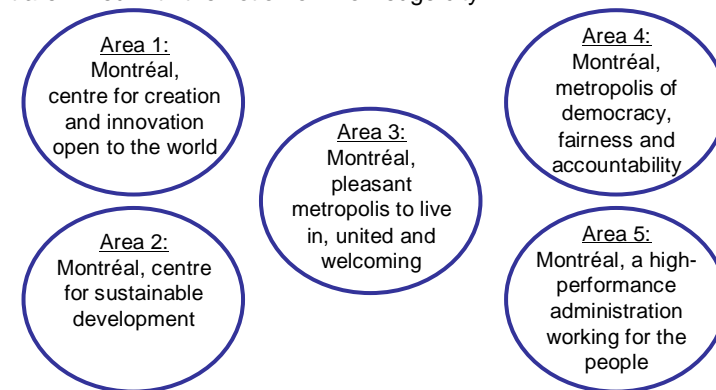
5. Recent plans include:

- The City of Montréal's statement on cultural policy, which primarily focuses on the importance of heritage conservation and enhancement of the technological arts;
- Montréal International's 2003-2005 strategic plan; the priority objective of the plan is to strengthen knowledge;
- The Montréal Metropolitan Community's vision statement for 2025, which focuses on growing a competitive economy to ensure that Montréal outranks the metropolises of the Americas in terms of talent, tolerance and technology;
- The Island of Montréal's 2000-2005 strategic plan, in which the regional development council's partners point to development of knowledge and culture as a primary economic and social challenge.

6. These include the policy regarding Montréal heritage as well as the City of Montréal's urban plan, cultural development program, social and community development plan and economic development strategy.

The priorities identified are in keeping with various recent improvement proposals and recommendations. Montréal must capitalize on the current momentum to cement its status as a knowledge city.

The five areas of development that emerged from the 2002 Montréal Summit are linked with the notion of knowledge city:



Recent commitments made by higher levels of government focus on the challenges related to knowledge:

"A learning society like Canada understands, for example, the fundamental importance of early childhood development and of lifelong learning, which starts in infancy and continues well after the final degree or diploma is granted. It also understands the importance of a progressive immigration policy.

"[. . .] We need a fundamental change in the way that our research institutions assess the economic potential of their discoveries. [. . .] We need a culture change beyond the labs too. The other obstacle is the dearth of private capital to invest in Canadian start-ups at the earliest stages, when they are still in gestation."

Excerpt from Paul Martin's speech "Building the 21st Century Economy" Board of Trade of Metropolitan Montréal, September 2003

"Our plan of action is aimed at increasing Québec society's contribution to research and development to 3% of the GNP."

Excerpt from "Hausser le niveau de vie des Québécois, Priorités d'actions politiques pour atteindre notre potentiel de prospérité économique" [Raising the standard of living in Québec: Priority policy actions for reaching our potential for economic prosperity], Québec Liberal Party, March 2003

"We are going to create an online government in order to offer all applicable services via the Internet."

Québec Premier Jean Charest at the Montréal Conference, May 2003

In this section, the Committee again takes up Montréal's fundamental weaknesses in terms of innovation, education and immigration so as to outline possible avenues for action.

1) Improve the innovation process

The Committee feels the Montréal community must capitalize on the fact that the Canadian and Québec governments are setting ambitious targets in terms of innovation. A metropolitan round table for innovation was recently created to study Montréal's overall process of innovation and recommend changes. It is vital that the exercise be successfully carried out. Improving Montréal's innovation process will require substantial changes, including:

- Better marketing of research in university faculties and government research laboratories operating in the city.
- Increased financial assistance at the start-up stages for new high-tech products and services.
- Financial institutions involved in the start-up and growth of businesses should provide superior expertise for evaluating the market potential for new products and services.
- Greater involvement of the private sector in the funding and support of young businesses.

The improvement of the city's innovation process must also include a better understanding and improvement of the R&D conducted in the private sector especially, since 85% of Québec's private R&D is carried out in Montréal.

If it is to successfully improve its innovation process the region will also have to develop major projects, such as university hospitals — which, in turn, have a multiplying effect on the number of patents issued and new businesses created.

To reinforce the process of innovation, Montréal must work harder at developing and rewarding creativity. The state, universities and leaders in the private sector must adjust their roles and create the best conditions possible for stimulating entrepreneurship.

Innovation process

Actions to take	Why	Stakeholders (main leadership)
<ul style="list-style-type: none"> • Develop measures that will stimulate the creation of private equity markets. 	<ul style="list-style-type: none"> • Promote start-up and growth of young knowledge-intensive businesses. • Avoid takeover bids and premature foreign buy-outs. 	<ul style="list-style-type: none"> • Government of Québec in conjunction with leaders of Montréal's private sector (e.g., venture-capital investors, business leaders).
<ul style="list-style-type: none"> • Strengthen Montréal's network of support for researchers and young knowledge-intensive businesses (increase their organizational and managerial capabilities). 	<ul style="list-style-type: none"> • Increase the number of patents and promote the start-up/growth of start-up companies. 	<ul style="list-style-type: none"> • Private-sector leaders (e.g., CEOs, leading management consultancy firms, etc.).
<ul style="list-style-type: none"> • Create a watchdog for higher levels of government to protect the excellence of R&D conducted in Montréal. 	<ul style="list-style-type: none"> • Make every effort not to discourage innovation resulting from R&D conducted by the private sector and the public arena (government laboratories) as well as by universities and hospitals. 	<ul style="list-style-type: none"> • Municipal administration in conjunction with leaders from the different sectors.

2) Develop human capital

In a true knowledge city, learning is accessible for life. Young people are encouraged to continue their studies. Institutions of higher learning seek to attract youth and every player involved, at its own level of responsibility, must make every effort to ensure that the educational environment is a stimulating one.

Access to top-quality educational institutions is not restricted to young people from all social backgrounds. High numbers of workers also register for ongoing training programs, which become a major source of financing for academic institutions.

To succeed in this area, the city must be home to a vast network of institutions equipped to fulfil their obligations to the community in a responsible manner.

In this vein, the Committee feels the time has come for in-depth reflection on the manner in which the education system is funded and organized. The Government of Québec must be encouraged to study new avenues that will help improve its educational institutions. The government currently provides the majority of the funding for Montréal colleges and assumes a large part of the funding granted to universities. These amounts should be complemented by other types of funding.

As indicated in this document, some colleges in Montréal cannot admit new students for strictly budgetary reasons. They should study new ways of introducing additional fees for foreign and mature students seeking to continue their training and who can afford the cost. Authorities should study measures that could remove the obstacles currently preventing colleges from obtaining alternative funding through foreign and mature students.

Success in terms of human capital hinges on creating multiple conditions conducive to development of a learning culture.

“Education must become the obsession of Montrealers.”

Process of human capital development

Actions to take	Why	Stakeholders (main leadership)
<ul style="list-style-type: none"> • Change the rules governing financing for colleges and universities. 	<ul style="list-style-type: none"> • Provide top-quality training for regular and mature students. 	<ul style="list-style-type: none"> • Government of Québec in conjunction with universities and colleges.
<ul style="list-style-type: none"> • Increase the number of decompartmentalization projects among institutional levels (secondary school, college, university) and among universities. 	<ul style="list-style-type: none"> • Encourage young people to stay in school and give them the incentive to pursue higher education — one of the key building blocks of a knowledge economy. 	<ul style="list-style-type: none"> • Colleges and universities.
<ul style="list-style-type: none"> • Increase the number of decompartmentalization projects among schools and the work environment (e.g., the Polyglobe program) and with other educational institutions in Montréal. 	<ul style="list-style-type: none"> • Encourage young people to stay in school and continue on to higher education. 	<ul style="list-style-type: none"> • Organizations that provide assistance for economic development (e.g., Board of Trade). • Organizations that provide assistance for joint actions (e.g., regional development council).
<ul style="list-style-type: none"> • Develop a collective strategic plan for long-term support for persistence in school and academic success. 	<ul style="list-style-type: none"> • Promote exchange / transfer of practices and knowledge among individuals and organizations dedicated to helping students stay in school and achieve academic success. 	<ul style="list-style-type: none"> • Organizations that provide assistance for joint actions (e.g., regional development council, Round table for joint action on academic retention and completion).

Montréal has many individuals and organizations that provide voluntary assistance for primary and secondary school dropouts to return to school and achieve academic success. This is a priceless strong point that must be capitalized on. "Since we are evolving in a knowledge-driven society, the next generation and training are now an unavoidable challenge for Montréal. In spite of this, it is surprising to note that many major stakeholders are not getting involved in education; the Government of Québec is practically the only stakeholder in this field. It would be desirable to see other players, starting with the City of Montréal, the MMC and the business community, playing an active role in education issues. The idea here obviously is not to replace the Ministry of Education but rather to seek additional actions."⁷

The issue of academic retention is very complex and affects several segments of the population. Parents and educators are first in line in terms of responsibility; their territory cannot be invaded. However, all members of the general public can contribute in their own way, even if it is simply by fulfilling their roles in society. The work ethic and the desire for success can be transmitted to young people in many ways; it can range from the cleanliness and beauty of public areas to seeing the example of people, especially their loved ones, working and making a contribution.

Montréal society would also benefit significantly from decompartmentalization. The city must be able to multiply the bridges between colleges and universities, between universities themselves, and between schools and the work environment. It must also be able to provide training for mature students seeking to improve their knowledge. As things stand, knowledge workers find it difficult to register for university biology or physics courses (e.g., a finance specialist working in biotechnology). A true learning city must be able to eliminate institutional barriers that take the spontaneity out of learning and intellectual curiosity.

It is vital that we progress in developing a culture of learning, so that we can be proud of our successes and make any changes required.

Some indicators of success:
Human-capital development

- Significant increase in academic retention, completion and success at the primary, secondary, college and university levels (number of diplomas, reduction in the drop-out rate).
- Fluidity between secondary, college and university levels (e.g., joint programs, research teams accepting talented young people).
- Increased bridges between universities (e.g., interdisciplinary programs, mutual marketing efforts to attract foreign students).
- Increase in the support provided by volunteers (e.g., community organizations, private businesses) helping students stay in school and achieve academic success (e.g., private companies "adopt" schools, financing excellence programs and providing new school supplies; individuals network in support of academic success).

7. Benoît Labonté, President of the Board of Trade of Metropolitan Montréal, in *Proceedings of the Montréal Colloquium 2017: A 375-year-old City*, April 30 and May 1, 2002.

3) Improve the immigration process and procedures for welcoming knowledge workers

A knowledge city imports and exports talent; however, it seeks to import much more than it exports. Talented individuals who leave the city are not entirely lost; they help create global networks. Mobility is an ongoing phenomenon; some people leave and return with more expertise.

Montréal has the crucial task of attracting highly qualified immigrants, in particular because population growth in Montréal is by far the lowest among Canada's five largest census metropolitan areas. It is therefore essential to compensate for this shortcoming by attracting qualified knowledge workers from other parts of the world. Montréal universities alone will have to recruit more than 300 new professors and research fellows annually over the next 10 years. Many of these recruits will have to come from abroad.

A knowledge city must meet the needs of its new knowledge workers. It must facilitate exchanges between current and new residents as part of knowledge networks. Integration is easy in such a city because information, be it about major trends in high-tech industries or the contents of local museum holdings, for example, is readily available.

The identity of a knowledge city is exemplified largely by the efficient and intelligent manner in which it helps its new arrivals integrate.

To successfully attract and retain foreign talent, Montréal must promote the emergence of local initiatives and encourage leaders to take them under their wings. It must cultivate leadership at all levels.

"Each stakeholder, in his/her role, doing more and doing better."

Immigration process

Actions to take	Why	Stakeholders (main leadership)
<ul style="list-style-type: none"> • Increase numbers of qualified immigrant knowledge workers (categories O, A, B*). 	<ul style="list-style-type: none"> • Compensate for low population growth. 	<ul style="list-style-type: none"> • Ethnic communities; • Alumni networks; • Organizations, such as Montréal International, that have an international scope.
<ul style="list-style-type: none"> • Set up a single-window system to receive and integrate foreign knowledge workers (categories O, A, B*). 	<ul style="list-style-type: none"> • Attract and retain talent; • Improve the current negative image of Montréal. 	<ul style="list-style-type: none"> • Organizations, such as Montréal International, that have an international scope.
<ul style="list-style-type: none"> • Develop a targeted e-government project with the state to provide most immigrant services (e.g., health insurance cards, driver's permits**) online. 	<ul style="list-style-type: none"> • Speed the integration of knowledge workers; • Improve the current negative image of Montréal. 	<ul style="list-style-type: none"> • Municipal administration in conjunction with higher levels of government.
<ul style="list-style-type: none"> • Develop a Web site to help knowledge workers integrate** (see Singapore model). 	<ul style="list-style-type: none"> • Attract and retain talent; • Confirm Montréal's status as a knowledge city. 	<ul style="list-style-type: none"> • In conjunction with the municipal administration, develop a new entity to create the Web site that leverages Montréal's talents in multimedia: a user-friendly Metropolitan site worthy of Montréal's reputation for creativity and talent.

*Refers to the National Occupational Classification.

**Can benefit both immigrants and Montréal residents.

Leveraging our assets and networks

Montréal has exceptional knowledge-based institutions, such as universities, research centres and a plethora of creative establishments and laboratories. It is each institution's responsibility to draw attention to these assets.

To be a true knowledge city, Montréal must believe in the quality of its assets and networks and must promote them.

Montréal would do well to **target areas of excellence** for the future by highlighting its distinctive expertise. The city must invest in fields in which it has depth and recognized expertise.

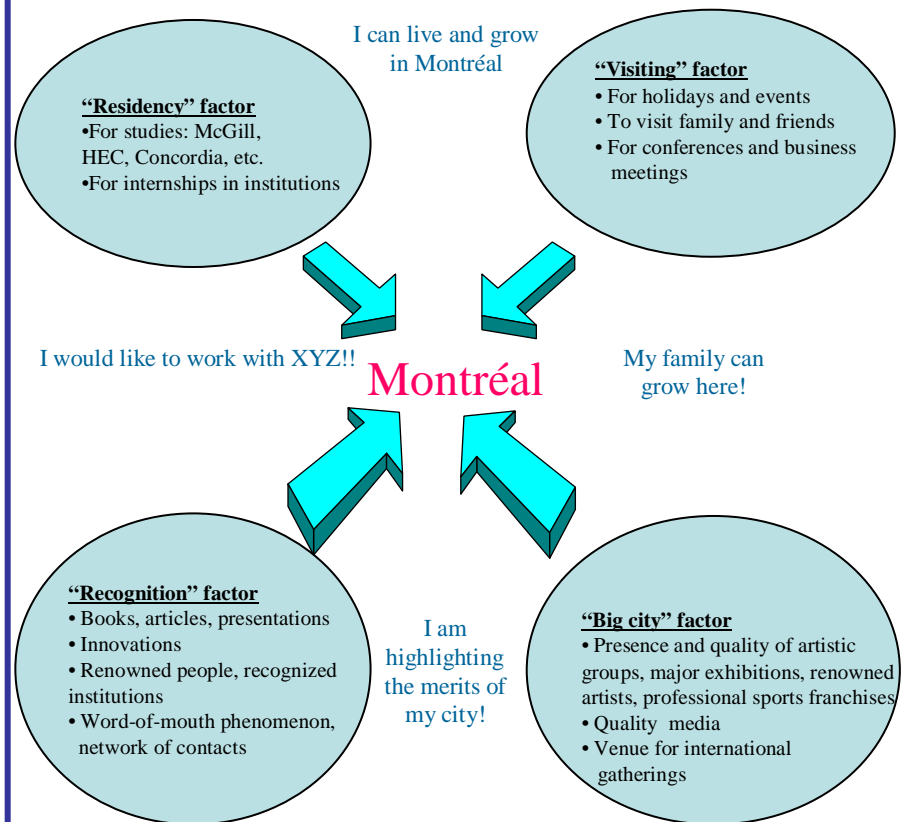
For instance, Montréal excels in the media/entertainment sector and has many activities and companies specializing in the field, including the world's leading stage manufacturer and one of the world's most prestigious jazz festivals.

The biomedical field is yet another highly developed niche in Montréal. The city is home to two faculties of medicine and several world-renowned research institutes. Approximately half of all pharmaceutical research conducted in Canada is carried out in the region. With its longstanding tradition, the life-sciences industry is today identified as one of the most promising in terms of economic and social development worldwide.

Metropolitan Montréal is also renowned worldwide for its aerospace expertise; the entire industry value chain is present. Colleges and universities also provide well-developed training programs in the field.

Montréal must capitalize on its natural strengths and authenticity to draw attention to its assets and networks.

Montréal as a knowledge city



SPEEDING MONTRÉAL'S TRANSFORMATION

3.1 ESTABLISHING PRIORITIES

***3.2 ENSURING THAT CONDITIONS FOR SUCCESS ARE
IN PLACE***

3.2 ENSURING THAT CONDITIONS FOR SUCCESS ARE IN PLACE

Montréal can be acknowledged as a top-tier knowledge city if it assesses its situation and learns from the experiences of foreign cities.

The key conditions for success include the deployment of explicit leadership at the local level, shared among the city administration, the private sector and various associations. This type of synergy played a vital part in transforming Austin into a knowledge city.

It is also important to ensure that immediate attention is paid to fundamental issues at stake in the areas of education, immigration and innovation. In this area, Montréal must adhere to a distinctive pace and dynamics of change that are in keeping with its status as a metropolis.

Lastly, the active participation of the citizenry is an essential condition for success and one that has proven its worth in other cities of knowledge that are thriving on the world stage. It is also a key asset most valued by workers in the knowledge economy who wish to play an integral part in the development of their metropolis and its emergence as a knowledge city.

Three conditions must be fulfilled to ensure Montréal's ascendancy as a knowledge city.

1) Explicit leadership at the local level (provided jointly by the mayor of the central city and other leaders in the private sector and associations, representative of the various areas of knowledge in the metropolis).

- Establish a vision of Montréal as a knowledge city;
- Identify strategies and areas of development for a knowledge city;
- Select priority investments;
- Develop success indicators as a knowledge city; follow up on performance.

2) Expeditious processing of priority issues in conjunction with higher levels of government.

- Attract and welcome knowledge workers;
- Transform the education system;
- Organize the private equity market and develop organizational expertise among researchers and start-up knowledge-intensive companies.

3) Timely organization of discussion forums for all Montrealers.

- Create permanent participatory space for residents (follow-up to the Montréal Summit);
- Open point of service/reception for knowledge-intensive initiatives and projects;
- Organize innovative conferences and forums.

Stakeholders' commitment

The success of any knowledge city is based largely on the commitment and perseverance of stakeholders: businesspeople, researchers, creators in various sectors, as well as volunteers working with the many organizations involved. Governments also play a vital role. The successes in Dublin and Singapore, for instance, have been achieved over a period of approximately 20 years during which local and other governments made commitments and renewed them in order to ensure their success.

Things are no different in Montréal. The successes achieved to date (in science, music, dance and many other areas) stem largely from various efforts and initiatives made by governments. These types of commitments will also be required to ensure Montréal's future success as a knowledge city.

Montréal requires various types of contributions from government, including adequate financial support for knowledge-based institutions and significant improvements in the efficiency of state systems and services that have a direct impact on the city's performance (such as education, immigration and e-government). The region must also be able to count on public policies and structural guidelines to support its ascendancy as a knowledge city.

For example, immediately after its release in the spring of 2000, the working paper of the Québec Ministry of Research, Science and Technology on Québec's scientific policy obtained strong consensus on the need to increase Québec's R&D efforts to the average level of the G7 nations. The Québec government's scientific and technology policy, made public the same year, set a clear direction and garnered a strong level of commitment from the key stakeholders involved to reach the objectives set.

Strong support from higher levels of government is a must.

Some bodies of higher levels of government that have enabled Montréal institutions to position themselves in the knowledge era are listed here, along with recent elements of Canadian and Québec public policy that can serve as a frame of reference for the metropolis.

Fonds de recherche
sur la nature
et les technologies

Québec

CRSH
CONSEIL DE
RECHERCHES EN
SCIENCES HUMAINES
DU CANADA

CRSNG
NSERC

Fonds de recherche
sur la société
et la culture

Québec

Fonds de la recherche
en santé au Québec

IRSC CIHR
Canadian Institutes
for Health Research

Public policies

Launch of Canada's Innovation Strategy	2002
Adoption of the Québec Policy on Science and Innovation	2001
Strategy for industrial clusters in Québec	1991
Québec's economic policy statement	1982
Green paper on scientific research policy in Québec	1979

Initiatives demonstrating the will of higher levels of government to commit to innovation and knowledge

Canada:

- Chairs of excellence in 21st-century research;
- Connectivity program;
- Updating of the intellectual property program;
- Technology Partnerships Canada;
- Canada Foundation for Innovation;
- Millennium scholarships;
- Expert Panel on Skills
- Industrial Research Assistance Program (IRAP).

Québec:

- Assistance for R&D through refundable tax credits for SMEs and large corporations;
- Tax incentives for recruitment of foreign researchers and managers;
- Efforts to support the biotechnologies industry (e.g., Cité de la Biotech in Laval and Bio-Levier program).
- Tax incentive schemes in various designated sites.

In addition to its basic responsibilities for all matters involving the quality of urban life, the municipal administration is clearly becoming an increasingly important tool for bringing residents together around common causes. The development of knowledge is a fine example. In this context, citizens expect their administration to show leadership, vision and drive in defending, before higher levels of government, metropolitan agendas that are vital for a knowledge-based city.

With regard to the private sector, community leaders are in a position to play a vital role in several areas. They may work in conjunction with elected municipal officials to establish a clear, inspiring vision for Montréal. They may also participate in the mapping out of strategic thrusts that will help make the vision a reality — be they urban infrastructures, attraction of talented individuals or identification of promising areas in which Montréal has real assets.

Structure-enhancing actions to be taken in the immediate future

To safeguard and strengthen Montréal as a knowledge city, it is vital to first build on immediate initiatives that can be implemented in the weeks and months ahead.

The Committee feels it is important that these initiatives and actions be a primary focus for local leaders; they must capitalize on their individual strengths, be they businesspeople, artists and creators, or researchers.

Here are a few examples of actions that could be taken:

The City could take steps to implement a secretariat to handle pro-bono knowledge-related projects and ideas that citizens want to promote. The body, which would be very small, would ideally have no links to the administrative apparatus. It would use volunteers to carry out some of its duties, but might initially have access to funding from the city for services that must be paid for.

The City could also establish an organization to create and manage a comprehensive Web portal, similar to the model set up by Singapore and other cities that have achieved success in this area. Like the above-mentioned secretariat (to which it could be linked), the organization would be able to play an important role in activating the network of knowledge-intensive workers and initiatives as well as highlight Montréal's hidden treasures in this area.

Generally, the municipal administration should not underestimate the basic contributions it can make to the development of a true knowledge-based city: cleanliness, safety, traffic quality, high architectural and urban planning standards, promotion of structure-enhanced and innovative architectural projects, and so on. Nor should it underestimate the importance of employing a neighbourhood-by-neighbourhood approach to enhance Montréal's assets and networks and to develop a climate conducive to exchanges and creativity. In this respect, enhancements to the neighbourhood and school library systems are paramount.

Lastly, municipal leadership must include a drive to defend and promote the interests of Montréal as a knowledge-based city with the higher levels of government and all decision-makers who can have an impact on the city. More than ever, residents and decision-makers expect their administration to take these steps.

The municipal administration is already active on the knowledge front, of course. Its efforts must be complemented by initiatives such as the ones we are recommending. The most important aspect is to promote the vision and to persevere. In the cities currently enjoying the greatest success in the knowledge-based economy, the municipal administration has been supporting efforts for two or three decades now.

Conclusion

In this document, the *Montréal, Knowledge City* Committee has focused on pinpointing the characteristics of a knowledge-based city, on assessing Montréal's positioning as such a city, on taking stock of the initiatives undertaken and the successes of certain cities in their efforts to position themselves, and on identifying priority areas of action required to safeguard and strengthen Montréal's status in the knowledge era.

The Committee has decided to propose certain areas of action on which Montréal's community leaders must focus in the coming months and years to cement the city's position as a knowledge city. The Committee did not, however, wish to compile a list of strategies and specific steps, as it feels it is incumbent upon elected officials and duly constituted bodies to map out a detailed strategy.

This document must not be seen as an end result, but rather a tool to be used to encourage all Montrealers to embrace the idea of Montréal as a knowledge city.

Cities all over the planet are seeking to attract and retain talented individuals. They all wish to maximize their knowledge flow and excel in new, high-growth areas like bio-sciences.

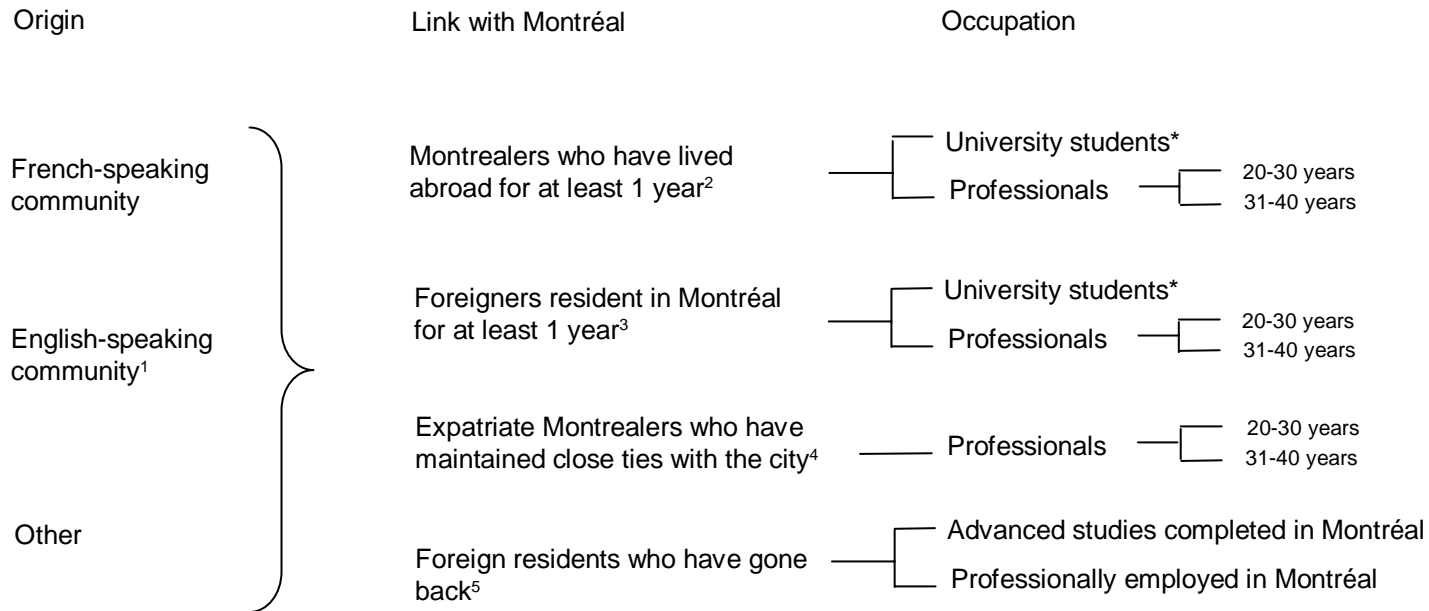
Given this context, Montréal is extraordinarily well-equipped to make its mark in the knowledge era.

That is why, from this moment on, Montréal must vigorously pursue its mission of being a true knowledge city.

Appendix

Details on the 100 interviews conducted with knowledge workers

Characteristics of people interviewed



We ensured that 30% of respondents were women. We also ensured that we interviewed talented individuals from several sectors, including the life sciences, information and communications technologies, finance, arts, management, etc. The respondents were identified by peer groups based on excellence criteria (e.g., academic and professional success, leadership qualities).

1. Includes English-speaking Canada, the U.S., the U.K. and Israel.

2. People born in Québec; people who currently live in Montréal or will be returning soon; people who went abroad for higher education, to take knowledge-intensive courses or to work. A year is equal to 12 consecutive months.

3. Individuals born and raised outside Québec; individuals who came to Québec for higher education, to take knowledge-intensive courses or to work.

4. People born in Québec who studied or worked professionally in Montréal and who have been living abroad for the past one year. They have family, social or professional ties in Montréal.

5. Individuals born and raised outside Québec, aged between 20 and 40. People who studied (higher education or knowledge-intensive courses) or worked in Montréal for at least two years after 1990.

*Also includes non-university students who meet the required talent criteria.

Topics discussed with Montréal knowledge workers

Montréal, Knowledge City

What is your idea of a 21st-century knowledge city?

In your opinion, does Montréal have the assets required to be a knowledge-based city (as you have described it)?

What local or foreign cities do you think are the epitome of a knowledge city?

Your city of choice

What determining factors/vital aspects do you currently look for when selecting a city in which to live and grow (e.g., closeness to immediate family, safety, income-tax situation, international character)?

If you had the choice, which cities would you like to live in, including Montréal? What would your selection criteria be?

Conversely, what elements would put you off a city entirely? What would make you eliminate a city, even if it is interesting, from your list of possible places to live (e.g., lack of high-tech businesses, closed culture, high unemployment, city too large)?

Your background

Description of the respondent's background, primarily the countries/cities in which she/he has studied and worked.

How and why did you choose Montréal along the way?

Why have you decided to stay in or leave Montréal?

What aspects would make you want to move to another city today? Would you move if your employer were to relocate?

Montréal's positioning

In your opinion, what assets does Montréal have that can be used to attract and retain talented individuals (i) in your profession; (ii) in general (e.g., availability of venture capital, diversity of industrial sectors, quality of the universities, cultural life)?

Are there any points that Montréal is seriously improving on?

In your opinion, what are the disadvantages and shortcomings that prevent Montréal from attracting and retaining talented personnel (i) in your field (ii) in general?

Are there any areas in which Montréal is seriously failing?

Improving Montréal's competitiveness

In what way/by what means can Montréal's positioning be strengthened, in your opinion?

What type of strategy/action does Montréal need to rank among the world's leading knowledge cities?

What concrete and immediate actions should the following entities take: (i) municipal administration (mayor of the city); (ii) university rectors; (iii) company heads and the business community; (iv) individuals like you?

Additional question for expatriate Montrealers

Do you still have ties with the Montréal community? If so, through what channels/institutions (e.g., family, alumni associations, business community)?

Basic information

- Citizenship (original and current);
- Year of birth;
- Year of arrival in/departure from/return to Montréal;
- Current city of residence and number of years;
- Mother tongue and other languages spoken;
- Marital status (e.g., single) and country of origin of spouse, if applicable;
- Number and age of children;
- Country in which majority of family ties are established;
- Number of years' professional experience;
- Country/ies in which respondent studied or worked for more than three months;
- Academic level (highest diploma obtained, e.g., MBA); institution and subject.

Contributions

We would like to thank the following people for helping us interview Montréal's knowledge workers:

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- Involvement in interviews conducted with Montréal knowledge workers, data entry and statistical analysis

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- Involvement in interviews conducted with Montréal's knowledge workers

We would also like to thank all of Montréal's knowledge workers who agreed to take part in our interviews, as well as all the people in the business, arts and education communities who agreed to talk to us about their vision of a knowledge city. Their thoughts and opinions were a valued contribution to our work.

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