uOttawa

L'Université canadienne
Canada's university

FACULTÉ DES ÉTUDES SUPÉRIEURES ET POSTOCTORALES

uOttawa

L'Université canadienne
Canada's university

FACULTY OF GRADUATE AND POSDOCTORAL STUDIES

Rhea Halfnight LeFlufy

AUTEUR DE LA THÈSE / AUTHOR OF THESIS

M.A. (Communication)

GRADE / DEGREE

Department of Communication

FACULTÉ, ÉCOLE, DÉPARTEMENT / FACULTY, SCHOOL, DEPARTMENT

From Industrial Cities to Cybercities:
A Look at the Influence of Municipal Policy in Montreal

TITRE DE LA THÈSE / TITLE OF THESIS

Lise Boily

DIRECTEUR (DIRECTRICE) DE LA THÈSE / THESIS SUPERVISOR

CO-DIRECTEUR (CO-DIRECTRICE) DE LA THÈSE / THESIS CO-SUPERVISOR

EXAMINATEURS (EXAMINATRICES) DE LA THÈSE / THESIS EXAMINERS

Daniel Paré

Caroline Andrew

Gary W. Slater

Le Doyen de la Faculté des études supérieures et postdoctorales / Dean of the Faculty of Graduate and Postdoctoral Studies

From Industrial Cities to Cybercities:
A Look at the Influence of Municipal Policy in Montreal

Rhea Halfnight LeFlufy

Thesis submitted to the
Faculty of Graduate and Postdoctoral Studies
in partial fulfilment of the requirements
for the MA degree in Communication.

Department of Communication
Faculty of Arts
University of Ottawa

Your file Votre référence
ISBN: 978-0-494-50885-5
Our file Notre référence
ISBN: 978-0-494-50885-5

Table of Contents

Tables & Figures

Abstract

This thesis examines the influence of municipal policy visioning initiatives on the transformation of industrial cities into cybercities. The emergence of the cybercity is mapped, and the role of municipal policy visioning initiatives in its development is examined.

Two fields guide this research: communication and urban studies. The cybercity concept draws on both fields, and both are necessary to answer the research questions posed: How do municipal policy visioning initiatives influence a city's transformation into a cybercity?

Montreal is used as a case study, and document analysis forms the core of the research strategy. Industry profile reports, government statistics and official organization websites provide supporting evidence.

The policy visioning document examined supports the development of Montreal as a cybercity only where that development coincides with the city's development as a creative city. Improvements to future municipal policy depend on the inclusion of specific benchmarks that enable the effectiveness of policies to be measured.

1.0 Introduction

"Wherever and whenever societies have flourished and prospered, rather than stagnated and decayed, creative and workable cities have been at the core of the phenomenon."

(Jane Jacobs, Forward to The Death and Life of Great American Cities – 1993 ed.).

1.1Background

Ever since people first began to gather together, settlements have been a catalyst for innovation and change (Mumford, 1961; Jacobs, 1989). As such they provide a platform from which to assess currents of socioeconomic transformation. Urban spaces are an expression of the people who produce, use and inhabit them. As the classic anthropologist Edward T. Hall (1966) asserts, they are "an expression of the culture of the people who produced [them], an extension of the society that perform[. . .] many complex and interrelated functions" (p. 167). As such, the shifts in the new urban setting both arise from, and give rise to, shifts in social practices, economic trends and technological developments. Cities are a physical expression of our societies, and for the purposes of this thesis, they are taken as the location from which we understand the major trends of our age.

Over the past century, the development, adoption and proliferation of new information and communication technologies1 (including, but not limited to: telephones, fax machines, cell phones, computers, the Internet, and email) have led to a number of changes in the way we organise our societies, our economies and our cities. These changes are

[1] Information and Communication Technologies are hereafter referred to as ICTs.

incremental and do not constitute a sudden break from past ways of living. Rather, they are one step of a gradual evolution that has been occurring for generations. In the urban context, this evolution is evident in the transformation of industrial cities into a new kind of city, the cybercity. The cybercity is not a virtual or online place. It is a way of conceptualizing contemporary cities that arises from observing them. It is a rearticulation of the city that encompasses the intertwining of contemporary urban space, ICTs and urban social practices (Boyer, 1996; Graham, 2004). As will be explained in Chapter Two, the cybercity is a place inhabited by a society which is increasingly reliant on technologically mediated forms of interaction to supplement face-to-face interaction, and where the economy is based on creativity and knowledge production.

As parts of the world shift away from industrial economies, it is important to understand what structures and drives the knowledge-based economies that are emerging. In a knowledge-based economy, thriving cities are key to the wealth of nations (Jacobs, 1984; Brender, Cappe & Golden, 2007). For example, Budapest, Helsinki, Seoul, Dublin and Brussels are each responsible for nearly half of their respective countries' gross domestic product (OCED, 2007). In Canada, Toronto, Montreal and Vancouver are each respectively responsible for the majority of their province's economic output (OCED, 2007). Because of this, it can be argued that Canada's success as a nation is dependent upon its major cities (Brender et al, 2007).

Over 80% of Canadians live in urban areas (Statistics Canada, 2007). Despite this, Canada's upper levels of government have not paid sufficient attention to the nation's major cities over the past several decades. This neglect has exacerbated a number of the challenges

these cities and their residents face today (Bradford, 2004; Brender et al, 2007). Consequently, as Canada's cities rally to compete in the knowledge-based economy and to be sustainable places for the majority of the nation's population to live, they are forced to become more innovative in their policy-making in order to succeed.

As a result of this need for innovative urban policy, and in response to the changes occurring in contemporary cities, municipal policy makers are working to develop strategies to help their cities cope, even thrive. One such strategy is the creative city strategy. Based in part on the ideas of Richard Florida (2002), the creative city strategy builds on the assertion that cities need successful knowledge-based economies to thrive. This strategy focuses on attracting knowledge-workers to a city in order to foster and strengthen the city's knowledge-based economic sectors.

1.2 Statement of the Research Questions

The literature reviewed in Chapter Two shows that there are a number of ways in which cities are changing as a result of the use of ICTs. The individual shifts, like the pieces of a jigsaw puzzle, must be assembled to form a coherent picture. Further, the dynamic nature of these 'puzzle pieces' may be affected by municipal policies that either support or hinder a city's transformation from industrial city to cybercity. This leads me to ask the following question around which I focus my research:

- **How do municipal policy visioning initiatives influence a city's transformation into a cybercity?**

In order to answer this question, Montreal will be used as a case study and the following four questions will be addressed:

1. What is the major undercurrent of transformation occurring in contemporary cities?
2. What model identified in the academic literature is foundational to current policy visioning initiatives?
3. How is this model used in Montreal's policy visioning initiative Montréal, Knowledge City: Report of the Montréal, Knowledge City Advisory Committee?
4. To date, has this policy visioning initiative been successful in achieving its stated goals?

1.3 Theoretical Location of the Thesis

This project brings together a number of fields of study. It is situated at the intersection of communication (media studies, social informatics, policy studies, knowledge economy, urban communication) and urban studies (urban and social geography, urban policy studies, urban planning). While this thesis draws on a number of fields, it sits squarely in the domain of communication. Cities are by nature venues of interaction and communication. The relationship between cities and the communication process is rich, stretching back to the birth of the first human settlements. Cities and the people living, interacting and communicating within them are continually engaged in the rearticulation of one another. This is a dynamic relationship where cities are an expression of the society that lives in them. As Castells writes, "[s]pace does not reflect society, it expresses it" (2004, p. 83).

Throughout this thesis, the city is understood as a place of communication and interaction, and from that perspective, contemporary city-building is explored as a way of fostering communication. The city, however, is equally able to be a locus of alienation and exclusion, which means that the planning, development and redevelopment of physical environments is a delicate process. In order for cities to be successful loci of communication, their role must be understood as such and nurtured.

1.4 Potential Contributions

This research contributes to the limited literature on cybercities. More specifically, it addresses the transformation of industrial cities into cybercities. It also contributes to the more robust accumulation of literature on creative cities by providing an analysis of the application of creative city ideas to real-life planning strategies. This aspect of the thesis is beneficial both for scholarship and for public policy. It provides insight into the changes occurring in contemporary Canadian cities. The visioning process cities use to develop strategies for future growth will benefit from this analysis of an existing municipal initiative. In particular, this study will help guide cities, especially Canadian cities, as they make concerted efforts to promote themselves as knowledge and culture hubs in the global arena.

1.5 Method

Document analysis and archival work form the core of the case study component of this research. This is so that a thorough understanding of current policy strategies will enable

the findings of the thesis to inform future policy. The document analysis is supported by data from Canadian and Québécois government statistics, and an overview of major research and cultural institutions' websites which are used to answer the four research sub-questions listed above.

1.6 Thesis Overview

This thesis is organised into five chapters. Following the Introduction, Chapter Two reviews the academic literature and theory supporting this study. At the outset, the nature of the city is defined and the myth of the 'death of the city' is addressed. This is followed by a description of the ways in which industrial cities are being transformed into cybercities, creative cities, and global cities. Last, the implications of this transformation for municipal policy and city visioning strategies are examined with particular attention paid to Florida's (2002) talent model and the critiques of his work.

Chapter Three elaborates on the research strategy introduced briefly above. This overview includes a statement of the research question and sub-questions and a description of how the research was carried out (a combination of academic literature review and document analysis with reference to data from Canadian and Québécois government statistics, and major research and cultural institutions' websites). This is followed by the justification of the research strategy, an explanation of how the study area (Montreal) and data sources were selected, and a description of the research tools used.

Chapter Four presents the results of the research and the analyses necessary to answer the research questions. There are three parts to this chapter. The first part outlines the main points presented in Montréal, Knowledge City and identifies the contributions of Florida's (2002) talent model to the report. The second part provides a summary of the empirical findings that underpin the analysis classifying Montreal as a knowledge city, a creative city and a cybercity. The third part of this chapter integrates the findings from the previous two parts enabling an analysis of Montreal's effectiveness in attaining its stated goals. This chapter concludes with a discussion of why Montreal can be described as a cybercity and a creative city. The discussion includes an assessment of the role of Montréal, Knowledge City in Montreal's development as such.

Chapter Five concludes the thesis. It comprises a summary of the primary assertions of this research, discusses their pragmatic implications and makes some suggestions for further research on the intersection of cybercity development and municipal policy.

2.0 Literature Review

Chapter Two is a review of the academic literature presented in support of this research. First, a definition of the city is established. From this foundation the 'death of the city' myth is explained and refuted. In its place, an argument for the transformation of the city is presented. Next, parallel to this notion of urban transformation, a link is drawn between urban form and phases of economic development. The emergence of a distinctly new urban form (the cybercity), resulting from current urban transformations and economic developments, is proposed. To better define the term cybercity, world cities and creative cities, as sub-categories of the cybercity, are also described. This is followed by an examination Florida's (2002) talent model, its critiques, and the implications of the application of this model in current policy initiatives.

2.1 The City

As the classic urbanist Gordon Childe (1950) clearly states, a single concise definition of the city is difficult to pinpoint. Cities can be distinguished by a number of things, among them scalar measures such as population, density and territory2. They can

---

[2] While these measures are important and useful, they become problematic when applied to cities across history. The population and density of cities are dependent on the ability of the surrounding area to supply the city with food, an ability that depends on the availability of natural resources, the techniques for making use of those resources, and the ability to transport and preserve those resources once they are extracted (Childe, 1950). Thus, the specific population, density and territory indicative of a city has varied greatly over time. Similarly, Blumenfeld (1964) explains that early industrial cities were generally limited to a radius that could be walked in about one hour (about 3 miles). With the advent of new modes of transportation the radius of the city has continued to expand.

also be defined as discreetly bounded units, distinct from the countryside surrounding them3, and distinguished by a concentration of non-agricultural workers4 (Blumenfeld, 1964). However, cities are continuously evolving over time. They are fluid entities that defy static indicators. This undermines the validity of such indicators as consistent measures of the city, which makes the concept of 'city', in and of itself, mutable, reflecting the dynamic nature of the processes occurring within it (Harvey, 1989). Which means that, as Max Weber (1958) writes, the only thing all definitions of the city share is the notion that a city is a collection of dwellings5. This leaves us with a rather abstract definition of the city as a spatial agglomeration of individuals that facilitates interaction and communication. The city is thus, in essence, a locus of interaction.

Beyond this foundational definition of the city, Mumford (1961) attributes three distinct functions to the city: magnet, container and transformer. Throughout history cities have attracted people from different ethnicities, cultures, technological traditions and languages with the promise of fresh opportunities (Mumford, 1961). Cities have then acted as the containers in which these people intermix, interact and communicate (Mumford, 1961). Cities thus accumulate, store and conserve a wide variety of social structures, and in doing so they create the milieu, and the opportunity, for transformation (Mumford, 1961). In

---

[3] According to Blumenfeld (1964), the traditional definition of city as static unit, confined within a set boundary, with an internal organization that follows a specific pattern, each part of which has a stable relationship with the whole, is inadequate because cities are perpetually growing and changing, expanding beyond their established boundaries.

[4] Cities provide the milieu for certain segments of the population (initially only the aristocracy and priesthood, but gradually an increasing number of individuals) to engage in activities not purely related to survival (i. e. creative activities) (Mumford, 1961). In this way, the city has always been tightly bound to the creative process.

[5] Even this assertion can be called into question given recent developments in virtual worlds and communities which are often referred to as cities despite their distinct lack of dwellings.

this way the city becomes not only a container but also an incubator – an incubator for creativity and innovation (Jacobs, 1961; 1984). Further, as Mumford (1961) suggests, one of the key characteristics of the city is its ability to harness this creativity and innovation in order to adapt to the needs of its residents.

Moving from this most general description of the city to a more precise definition of the industrial metropolis of the mid-twentieth century, we see that the city continues to evolve. It is becoming increasingly complex in both its functions and its form. According to Blumenfeld (1964), the industrial metropolis is both a centre of leadership and material production. Its population is large, as is the territory it covers (Blumenfeld, 1964). Within this kind of city there are distinct patterns of land use, whereby the central business district, industrial areas, and residential areas are separate (Harris & Ullman, 1945; Blumenfeld, 1964). These cities are characteristically monocentric and have a single core or central business district with residential and industrial areas arranged around it in concentric circles or ray-like sectors (see Appendix A).

Over the last century there has been a shift away from these traditional monocentric cities towards a new "polycentric" or "multipolar" urban form (Hall, 2003, p. 145; Ascher, 2000, p. 191; Gospodini, 2006). This shift to a more polycentric urban structure occurs because new communications and transportation technologies modify the traditional monocentric urban form, causing the city to function increasingly as a network of nodes (Castells, 1999; 2004; Sassen, 2000). This means that instead of having a single concentrated centre, the city can have multiple centres, also known as cores or epicentres,

focused towards different activities and services (Ascher, 2000; Hall, 2003; Gospodini, 2006).

According to Hall (2003) the polycentric city typically has five cores. They are: a traditional business core centered around a port or the historical city centre; a secondary business core made up of offices and entertainment venues; a tertiary business core with newer offices and sometimes entertainment activities; an outer "edge city" that is often towards the airport; and one or more outermost edge cities which are often planned new towns and are specialized concentrations with large amounts of space as a result of urban regeneration or land reclamation (Hall, 2003). Typically these different cores are located close to a single preferred area of development although they may also be dispersed across the city, anywhere from the geographic centre, to the edge of the metropolitan area (Hall, 2003).

Similar to this, Gospodini (2006) describes the post-industrial city as having four epicentres. They are: a high culture epicentre where cultural buildings and complexes are clustered in order to establish milieus for creativity and cultural production; an inner-city popular leisure epicentre, concentrating bars, restaurants, cafes, popular music halls, fashion shops, book and music shops and small avant-garde theatres; a culture and leisure epicentre that is, wherever possible, generally regenerated waterfront that was once industrial and has now been redesigned as museums, galleries, condominiums, etc; and, on the edges of the post-industrial city, there is a transitional space between dense urban space and rural space, characterized by a kind of sprawl that follows highways and major roads instead of forming small neighbourhood centres (Gospodini, 2006).

There are a number of pragmatic and theory-based explanations for these transformations. As will be shown in the following sections, from a pragmatic perspective, developments in ICTs and transportation technologies play an important role in this shift. From a more theoretical perspective, Castells uses the interaction of two "competing logics", namely the "space of flows" and the "space of places" to explain the transformation (1999; 2004, p.85). The 'space of flows', is a kind of communicative space; it is the interactive network that links geographically distinct people and places, enabling communication between them (Castells, 1999; 2004). The 'space of flows' refers to the organization of space around flows, which he defines as transfers of information, people, cargo, images, sounds, technologies, and capital (Castells, 1999; 2000). Although cities as spaces of interaction have always encompassed an element of the 'space of flows', this is hugely enhanced as a result of ICTs. As new technologies are developed, the 'space of flows' becomes increasingly important in the interactions between individuals of the network society.

Lash and Urry (1994) advance a framework for the analysis of flows that is complementary to Castell's space of flows. They understand that the increasingly rapid circulation of capital, labour, commodities, information and images is causing physical space to become more abstract and "empty" (Lash & Urry, 1994, p.13). This is because an understanding of space as a location is becoming less relevant. Rather, space is seen more as something we move through. To explain this occurrence within the context of the city, they cite Mumford who asserts that in the pre-modern city, streets were places to live in, whereas now, they have become places to move through (Lash & Urry, 1994). City streets, by this

interpretation, instead of being places of interaction themselves, are simple the channels through which these flows pass.

In opposition to the 'space of flows' Castells describes the "space of places" (Castells, 2004, p. 85). The 'space of places' is the more traditional understanding of place as a geographically bounded location in which experiences and activities occur (Castells, 2004). The 'space of places' is the static counterpart to the dynamic 'space of flows'. Cities are made up of a combination of these two kinds of space, and, as new ICTs are developed, the relative importance of these two kinds of space changes (Castells, 2004). New technologies are disrupting the past balance between communicative networks and physical space. They are forcing the creation of a new balance that better meets the needs of the information society. As the balance evolves, the way in which people make use of the city adapts, and the city itself changes.

As the city evolves in response to developments in ICTs and transportation technologies, the ensuing strengthening of the 'space of flows' makes it necessary to map the transformations so that we can understand them better. Over the years, numerous explanations and potential futures have been explored. What follows is an explanation of two of the dominant schools of thought. One supports the decline and dispersal of the city, the other its transformation and flourishing.

2.1.1 The 'Death of the City' Myth

It has been suggested that the development, adoption and proliferation of ICTs (telephones, cell phones, the Internet, email, etc) are undermining cities by diminishing our need for them. Historically cities developed because, as concentrations of people, they facilitated interaction. These 'death of distance' and 'death of the city' arguments assert that since ICTs permit people to locate most activities anywhere, the need for people to gather together in urban places is diminishing (Webber, 1968; Pascal, 1987; Cairncross, 1997). In the same way that the telephone was the catalyst for the initial movement of city dwellers into the suburbs (de Sola Pool, 2004), the argument is that the continued development of ICTs is enabling ever increasing dispersal out of the city.

Webber (1968) asserts that the sole purpose of the city is to concentrate people within a specific area since physical proximity reduces the cost of interaction. According to Cairncross (1997), as the cost of communicating over long distances decreases to zero with email and cheaper long-distance phone charges, location will no longer be a significant advantage. Because of this, the necessity for the concentrations of people found in urban centres will diminish. This is particularly true for businesses, as more and more, they are free to employ skilled workers regardless of their respective locations (Cairncross, 1997). Conversely, due to ICT developments, workers will no longer be forced to emigrate to find jobs, as they can telecommute via phone and internet6 (Mitchell, 1995; Cairncross, 1997). It

---

[6] Gillespie and Richardson (2000), however, observe that there is insufficient empirical data to support the claim that telecommuting eliminates the need for physical presence in the workplace. While they admit that telecommuting is changing traditional commuting patterns, based on their research, they suggest that workers are generally still required to commute physically to their offices the majority of the time.

has become possible to locate anywhere (provided that location is serviced by the telecommunications network), be it a mountain top or a remote island, and maintain consistent and intense contact with acquaintances and business associates. The question that must be raised here is that, while it may be possible, is it necessary?

Webber (1968) and Cairncross (1997) insist that this capacity for dispersal will lead to the demise of the city, and yet, there is increasing evidence to the contrary. While they are correct in identifying the huge potential for urban change that ultimately results from the development of ICTs, the specific outcomes they predict prove less accurate. It is true that some of the most important social ties (those of direct face-to-face communication and interaction) that once bound people to spatial settlements appear to be eroding as ICTs permit people to disperse over ever wider areas (Webber, 1968; Pascal, 1987; Mitchell, 1995, 1999; Cairncross, 1997; Hall, 2003; Castells, 2004). This is not, however, leading to the decline of the city. While certain activities and groups of people are dispersing7, others continue to concentrate themselves in the urban core (Sassen, 1991; Castells, 2004). As we will see in the following section, it is more accurate to claim that the changes occurring as a result of ICTs are playing an integral role in the city's transformation not its dissolution.

---

[7] In certain fields, ICTs permit any place to compete with any other as long as it has a qualified labour force and competitive cost of doing business A clear example of this is call centres. Call centres are increasingly located away from the urban centres they service (Pascal, 1987; Hall, 1998). For example, places like Jamaica Digiport International in Jamaica and Cyberjaya in Malaysia provide data processing and call centre services to international companies (Skinner, 1998; Bunnel, 2004).

2.1.2 The City Transformed

Despite the dire predictions of theorists like Webber (1968) and Cairncross (1997), the city endures. For the first time ever, in 2008, the world's urban population will equal its rural population from which point on the urban population will be the majority (UN: DESA, 2008). By 2050 it has been projected that more than 70% of the world's population will live in cities (UN: DESA, 2008), and the 2006 Canadian Census showed that 25 million Canadians, over 80% of the population, already live in urban areas (Statistics Canada, 2007). Based on these statistics, it appears, in fact, that the city is thriving. Contrary to the 'death of the city' argument, it now seems that although the transfer of information through ICTs is replacing some of the need to move physical bodies over physical distances, the new technologies do not negate the reality of space, place and distance (Hall, 1998, 2003; Plaut, 2004). Similarly, while ICTs may change the ways that people interact, they do not eliminate the need for face-to-face interaction (Gaspar & Glaeser, 1998; Panayides & Kern, 2005).

The 'death of distance', understood to be the result of ICT development, turns out to be a bit of a misnomer. While in some circumstances ICTs do negate the need for physical travel, this is not universally true. As is often the case, the situation is more complex, and in effect, it is more accurate to say that telecommunications networks act as a complement to transportation networks not a replacement (Graham, 1997; Hall, 1998; Plaut, 2004). Communications and transportation networks function together to connect physically disparate places, allowing people to be present in a given place either by travelling there, or

by connecting to that place electronically8. Similarly, services may be delivered, and transactions completed, physically and/or electronically. As Hall (1998) explains, there is a notable parallel between the development of transportation technology and communication technology. Over time, they have developed in stages that serve similar geographical distances; local telephone correlates with urban rail in the 1900s; broadcasting with car travel in the 1920s; long-distance telephone with international air travel in the 1960s. Each pair enables communication and/or travel across a similar distance, illustrating two lines of innovation responding to the same expanding sphere of human interaction.

The relationship between communication and transportation can be categorized in two ways: as substitutive (where communication technology eliminates the need for travel) or as complementary (Plaut, 2004). Complementary relationships take on two forms: enhancement (where communication leads to additional travel)9, and efficiency (where one reduces the resources necessary to perform the other) (Plaut, 2004). As Plaut's (2004) analysis shows, the interaction between transportation and ICTs is complex, and can rarely be restricted to a simple substitutive relationship. Thus, given that ICTs cannot replace

---

[8] This leads to the dynamic that Mitchell (2004) refers to as the 'economy of presence' in which a value is given to presence. He defines presence as the act of being in a specific place at a specific time (also called co-presence (Boden & Molotoch, 2004)), and it is valued differently than telepresence, which he defines as presence mediated by communication technology. For example, although a face-to-face business meeting is more direct and immediate than a phone conference, the cost, in terms of time, transportation, coordination of availability and the use of a physical meeting place, is greater (Mitchell, 2004). It also requires a higher level of attention, sincerity, and commitment from the participants (Boden & Molotoch, 2004). Consequently, although telepresence is cheaper than presence, it is less intense and less immediate. People must continuously choose between the various forms of communication available to them, weighing the costs and benefits of each, and selecting the form that best suits the situation at hand.

[9] Graham (1997) suggests that tourism, international conferences and global trade are examples of this.

transportation, the complete negation of space, place and distance is impossible, and the importance of the city as a locus of interaction remains.

Similar to the discussion of ICTs and transportation above, the suggestion that intense face-to-face interaction occurring in the urban milieu might be replaced by ICT mediated interaction is flawed. ICTs disrupt the traditional patterns of face-to-face communication by creating new opportunities for interaction mediated by an increasing variety of technologies (Mitchell, 1995, 1999, 2004; Ascher, 2000). Because of this they have had a significant effect on everyday urban social practices. Even so, they do not negate the need for face-to-face interaction. This is evident both in Gaspar and Glaeser's (1998) empirical study of ICT use in cities, and in Panayides and Kern's (2005) follow-up study. Both studies found that electronic communication not only increases the opportunities for face-to-face interaction, but also makes that interaction more complex. According to them, in the contemporary city, most social activities are carried out through a combination of electronic and face-to-face communication (Gaspar & Glaeser, 1998; Panayides & Kern, 2005). For example, an individual will sometimes interrupt a face-to-face meeting to answer their cell phone, causing them to carry out two sets of interaction simultaneously.

Thus, while the effect of distance as a barrier or impediment may be diminishing, the principle of urban agglomeration (the concentration of people in urban centres) still holds true (Hall, 1998; 2003). This true is for a number of reasons, among them that ICTs can never fully replace physical travel or face-to-face interaction. Although ICTs create the possibility for people to locate themselves anywhere, significant numbers of people still choose to live in the close proximity afforded by urban centres. Cities are the location in

which intense face-to-face interaction flourishes, creating the social infrastructure that Sassen (1991) and Florida (2002) suggest is of utmost importance for the success of cities in the emerging knowledge-based economy. Thus, as ICTs create new opportunities for interaction, they continue to reinforce the place-based meaning of cities (Graham, 1997; Waitt, 1999).

At this point it is important to note that while ICTs do not eliminate the importance of distance, they do provide a means to overcome some of the barriers imposed by it. While place remains highly relevant, space does decrease somewhat in importance. As the barrier of physical distance is broken down, the specific characteristics of a place become more important (Waitt, 1999). The qualities that make a city unique and interesting are crucial in distinguishing it from other cities that are now, thanks largely to new innovations in ICTs and transportation technologies, equally accessible (Waitt, 1999). This is where place-marketing and the repackaging of cities as consumable goods comes into play. As ICTs level the playing field between cities, an intense inter-city competition arises to attract not only investment and tourism, but also new residents who comprise the social capital that fuels knowledge-based economies.

2.2 Urban Economies

Different phases of economic development have often been linked to distinct urban forms. For example, the merchant economy with medieval market towns, nineteenth-century capitalism with the classic factory town, and assembly line mass production with the industrial city (Ascher, 2000; Hall, 1998; Sassen, 2006; Scott, 2006). Similarly, the rise of

knowledge-based economies heralds the emergence of a new urban form. This new urban form, like the knowledge-based economy, is characterized and defined by the creation, use and experience of knowledge and new technologies.

2.2.1 The Transition from Industrial to Knowledge-Based Economy

While knowledge and the ability to invent and innovate have always played a key role in economic growth, over the past few decades there has been a marked intensification of knowledge-based activities in all sectors of the economy (Foray, 2000). This has lead to what is arguably a new economic structure, distinct from the industrial economy that came before. According to Foray (2000), the knowledge-based economy10 results from the interaction of two trends: first, the continued expansion of knowledge-related investments and activities (such as corporate research and development); and second, a technological revolution (the proliferation of new ICTs) that has transformed the production and transmission of knowledge and information. The rise of this new economic structure is not confined to the expansion of prior knowledge-based economic activities such as banking, electrical engineering and pharmaceuticals, or the growth of high technology industries, such as biotechnology and software engineering. It is more accurately described as the spread of knowledge-based activities across all sectors of the economy (Ascher, 2000; Foray, 2000).

---

[10] Foray (2006) describes the four main characteristics of the knowledge-based economy as: intense knowledge creation; accumulation of human capital; management of information, knowledge and expertise; and exchange of knowledge and information as economic goods. It should also be noted that this new economic structure is closely linked to Florida's (2002) notion of the creative class and the creative economy as in both cases the creation of new ideas, new technology and new creative content is paramount.

At the forefront of this knowledge-based economy are business and financial services, law, media, design and high-technology industries (Florida, 2002; Scott, 2006).

Various critiques of Castells' work on the information society bring up some important questions regarding the emerging knowledge-based economy. Webster (1997), for one, questions the novelty, size and significance of what he terms 'informational labour' in the workforce. While he is correct in asserting that many of the knowledge-based fields (banking, electrical engineering, and pharmaceuticals to name a few) have roots as far back as the early part of the twentieth-century (Webster, 1997), he is neglecting one key distinction: the issue is not the newness of these fields, but their intensification and proliferation in recent years. A similar argument can be made regarding the proportion of these activities in the new economy. The issue is not so much the current size (about 30% of the working population in the USA11), but rather the rate of growth and the important catalyst-like role they play in the economy and society. Florida (2002) compares the influence of the creative class to that of the managerial class who set the tone for the American public in the 1950s (Whyte, 1956, as cited in Florida, 2002)12.

---

[11] Since the beginning of the twentieth century the size of the creative class (people employed in information and communication technologies, architecture, engineering, science, education, the arts, design, health care, management, finance, legal affairs, and marketing) in the USA has grown from about 3 million to 38 million, doubling in the last 20 years (Florida, 2002). While the service sector has also grown over this period and is currently the largest segment of the American workforce (55 million people), Florida (2002) asserts that this class is not nearly as influential in the overall economic picture.

[12] While the organization men can be associated with homogeneity, conformity and a growing divide between workers and leaders, the creative class favours individuality, self-expression, and openness (Florida, 2002).

To sum up, the emergence of the new knowledge-based economy does not signal a break with past economic models. Rather, it is the intensification of an incremental transition away from the industrial model begun decades, ago. As during previous economic eras, there are remnants of what came before, and seeds of what is yet to come, and it is through the integration of these elements that we achieve a complete picture of the current situation. To suggest that we are not experiencing a shift in the predominant economic structure simply because there are still places where an industrial-style economy dominates or because there were knowledge workers 50 years ago is an oversimplification that overlooks the complexity of the situation.

2.2.2 The 'New' Economy & the City

There are three primary characteristics of the new knowledge-based economy identified by Scott (2006) as clearly illustrating the link between the knowledge-based economy and the contemporary city. First, in the contemporary city, production in knowledge-based sectors occurs in dense and flexible networks of highly specialized firms (Scott, 2006). When producers are located in close proximity they are able to easily draw on their network connections to acquire necessary goods and services as needed, instead of tying up capital by maintaining stock piles or large staffs (Scott, 2006). As Florida (2003) points out, this clustering reinforces the place-based significance of cities. Second, the labour markets associated with the new economy tend to be competitive and fluid, with a significant percentage of workers engaging in freelance, part-time and contract work (Scott, 2006). This necessitates a relatively large pool of knowledge workers with a variety of high-level skills (Sassen, 1991; Florida, 2002; Scott, 2006). Such a pool not only supports the existing

knowledge-based sector in a city, it also attracts new corporate investment and new knowledge workers, concentrating them in specific urban centres (Florida, 2002; Scott, 2006). In addition, companies cluster to benefit from these concentrations of talented individuals (Florida, 2002: 2003). Third, increasingly widespread niche markets have caused producers to compete more and more on the basis of the uniqueness and innovativeness of their products (Ascher, 2000; Bradford, 2004; Scott, 2006). This means that cities, as dynamic places that foster creativity and innovation, become strategic sites for the production of highly-specialized knowledge-based goods (Sassen, 1991; Bradford, 2004; Scott, 2006).

2.3 The Cybercity

As cities change from sites of industrial production to sites of knowledge production, they undergo a fundamental transformation. This transformation can be viewed as a paradigm shift, in Thomas Kuhn's (1962) traditional sense of the term. Kuhn (1962) describes a paradigm shift as the process of changing from one worldview to another, with the new paradigm emerging to replace the previous one because it better represents and explains the situation at hand. In the case of the contemporary city, this shift is occurring at several levels, from the raison d'être of the city, to the ways in which it is inhabited, experienced and represented. The emergence of a new urban paradigm is a process still underway and as such I will attempt only to describe the main currents of the transformation. In this way I will provide a sketch of the new paradigm and create an overview that better enables an examination of some of the specific changes occurring in the contemporary city.

The 'cybercity' is one way of conceptualizing the emerging urban paradigm. It is neither a virtual community nor an online place (Boyer, 1996). It brings the tangible elements of the built environment of the city together with the intangible elements of the communication and interaction that occurs within the city. It is best understood as a physical city that encompasses the intertwining of the built environment, ICTs, and contemporary urban lifestyles (Boyer, 1996; Graham, 2004). These various elements of the cybercity are not simply overlapping or intersecting. They are interacting in a dynamic fashion, furthering the evolution of ICTs, the contemporary city, and the city residents, as all three grow and change in concert with each other.

As was noted earlier, an important aspect of the city is its ability to harness creativity and innovation (Mumford, 1961). In the case of the cybercity, it is specifically the creation, use and experience of knowledge and new technology that are characteristic (Graham, 2004). As the economy shifts away from traditional industrial economy towards the valuing and subsequent exchange of knowledge as the primary economic good, there is a diffusion of intense knowledge-based activities throughout every sector of the economy (Foray, 2000). Further, as the economy becomes increasingly digital, the need for complex social infrastructure in addition to technical infrastructure grows, resulting in the pooling of talented and creative people in certain, often urban, locations (Sassen, 1991; Florida, 2002). This creates a milieu that mixes a specific set of resources and talent primarily related to the production and exchange of knowledge. In this way, the urban setting of the cybercity is as important to the development of new technology, as that technology is essential in changing the form, shape and experience of the city (Graham, 2004). Technology, social practices and

the built environment are thus engaged in a continuing, cumulative and generative rearticulation of each other.

The main distinctions between the industrial city and cybercity can be seen by isolating the four shifts described in Table 2.1.

Table 2.1 – From the Industrial City to the Cybercity

Industrial City	Cybercity
• Intertwining of physical space, urban social practices and industrial production.	• Intertwining of physical space, urban social practices and ICTs.
• An urban society that is primarily reliant on face-to-face interaction.	• An urban society that is increasingly reliant on technologically mediated forms of interaction to supplement face-to-face interaction.
• An economy characterised by industrial production.	• An economy characterised by creativity and knowledge production.
• There is a symbiotic relationship between urban form, experience of place and industrial production.	• There is a symbiotic relationship between urban form, experience of place and the development and use of ICTs.

The cybercity is an overarching concept that aims to explain the paradigm shift that is occurring in all cities as they move from the industrial age to the information age. Cybercities come in a variety of shapes and sizes among them global and world cities (Friedmann, 1986; Sassen, 1991; Beaverstock et al, 1999) and creative cities (Landry & Bianchini, 1995; Florida, 2002). These different classifications are not mutually exclusive and, in fact, often overlap. An example of this is New York City which is consistently ranked as one of the top tier world cities (Beaverstock et al, 1999), and also rates highly as a creative city (Florida, 2002).

2.3.1 The Global or World City

The decline of former industrial capitals through the geographic dispersal of traditional centres of manufacture and industry, combined with the reorganization of production, the centralization of ownership, and the internationalization of finance, has

resulted in a simultaneous "spatial dispersal" and "global integration" leading to the emergence of global cities (Sassen, 1991, p. 3).

Global cities have four characteristics that distinguish them from regular cities. They are: first and foremost, central command nodes of the global economy; secondly, important locations for specialized service firms, finance firms in particular, which have supplanted manufacturing in the economy; thirdly, production sites for the leading industries, which include the production of innovations; and fourthly, markets for the innovations and products they produce (Sassen, 1991). Sassen (1991) names three cities as full global cities: New York, London and Tokyo.

Numerous other theorists also discuss the notion of global or world cities (see Friedman, 1986; Beaverstock et al, 1999; Hall, 2003). These theorists often use the term 'world city' to distinguish their conception of such cities from Sassen's notion of the 'global city'. Unlike Sassen and her global cities, world city theorists elaborate an extensive ranking of world cities (alpha, beta and gamma[13]), and include a much broader range of cities. They base their classifications on a variety of criteria, among them population, corporate economy, internationalization and concentration of specialized services (i. e. media, advertising, banking, culture, fashion). These global or world cities form an interconnected network that transcends national boundaries and concentrates finance, culture, social, service and information industries in specific locations (Sassen, 1991, 2000; Graham, 1999). They rely

[13] Alpha world cities are global service centres in four areas: accountancy, advertising, banking and legal services; beta world cities are global service centres in three of these sectors; while gamma world cities are global service centres for only two sectors (Beaverstock et al, 1999; see Appendix B for a table of world city rankings).

heavily on information and communication networks, and grow through the accumulation of resources (such as a talented labour pool) that are valued by corporations, finance firms and specialized service firms (Sassen, 1991; Graham, 1999).

2.3.2 The Creative City

All cities are incubators for creativity and innovation (Jacobs, 1961; 1984). A creative city, in particular, is a city characterised by its intense and continuous knowledge production (Michaud, P. & A. Tcheremenska, 2003). While Jacobs suggests this is true of all cities, it is particularly true of creative cities. Specifically, a creative city is defined by its ability to develop innovative products, processes and services from its raw knowledge capital. The majority of the creative city's economic activity, including its key industries, are based in creative sectors, with a high concentration in areas like research and development, and strategic management (Hospers, 2003; Michaud, P. & A. Tcheremenska, 2003). The production of knowledge is necessary in a creative city, and, in order to maintain it, it is essential to foster the development of human capital, and to invest in attracting and keeping both qualified immigrants and new knowledge-based companies. Both Sassen (2000, 2004), who states that the social infrastructure necessary to foster knowledge production exists in major cities as a result of the pooling of knowledge workers14, and

[14] Knowledge workers, described by Richard Florida (2002) as the "creative class", typically have university degrees, and hold positions requiring strong creative abilities and high levels of knowledge. They are generally people employed in information and communication technologies, architecture, engineering, science, education, the arts, design, health care, management, finance, legal affairs, and marketing.

Florida (2002), who posits that creative people are typically drawn to places that are urban and score highly on his creativity index15, support this assertion.

While cities always thrive on creativity and diversity (Jacobs, 1984), creative cities are particularly dynamic and stimulating places where new ideas, experimentation, and innovation flourish (Florida, 2002; Hospers, 2003; Bradford, 2004). Ideally they are places that provide a diverse, accepting and supportive social and cultural milieu for people from all walks of life (Florida, 2002; Bradford, 2004; Scott, 2006). They attract and concentrate talented and creative people, and they are centres for research and development of new technologies (Florida, 2002; Bradford, 2004; Scott, 2006).

The transition from industrial city to the various forms of the cybercity (global city, creative city, etc) is inextricably bound to the proliferation of new ICTs (Mitchell, 1995; 1999; Graham, 1999; 2004; Ascher, 2000; Castells, 2000; 2004; Hall, 2003; 2004), and the emergence of the knowledge-based economy (Sassen, 1991; 2000; 2006; Hall, 1998; Florida, 2002; Scott, 2006). The contemporary city provides the milieu in which these trends meet and interact, a process through which the city itself is transformed. The cybercity provides a geographically specific location that facilitates the interactions between firms, concentrates knowledge workers, and provides the necessary dynamic for innovation. This environment is characterized by competence and performance, and works as a catalyst both for enhancing creativity, and putting it into practice.

---

[15] In short, these places are characterized by their openness to and acceptance of diversity, a significant percentage of individuals working in creative sectors and a high level of innovation and technological development. For greater detail, see *The Rise of the Creative Class* by Richard Florida (2002).

2.4 The Creative City & Municipal Policy

Creativity is playing a key role in current policy discussions in Canada and in cities across North America (among them: Austin, Baltimore, Cincinnati, Detroit, Memphis, Montreal, Pittsburgh, Tampa Bay, Toronto, Vancouver and Winnipeg). The presence of people employed in creative sectors, and their relationship to urban regional growth is increasingly considered to be pivotal in municipal policy. Without a vibrant creative workforce (what Florida (2002) calls the 'creative class') made up of artists, musicians, designers and writers, as well as engineers, scientists and intellectuals, a place lacks the knowledge-base necessary to be successful in the knowledge-based economy (Venturelli, 2002 as cited in Flew, 2005). This issue began to show up in civic policy discussions as early as the 1980s. For example, Hannigan (2007) quotes Vancouver's "Arts Means Business" survey report from the early 1980s in which it is stated that the arts and various arts-related activities "constitute one of the few growth industries in [Vancouver]," leading to the further statement that "[Vancouver's] economy can be said to depend on the vitality of its cultural life" (p.65). Similarly, another report by the City of Vancouver, Toward the Creative City, published in 1993, recognises the importance of creativity for its economic, social, intellectual and spiritual benefits in the information age (as cited in Duxbury, 2004).

Over time such observations about creativity have evolved into creative city strategies. Most recently, such strategies have come to play an important role in urban policy initiatives, with Richard Florida's (2002) ideas taking a central position. As Donald and

Morrow (2003) write, Florida's work represents one of the "most significant contributions to the urban economic development literature in recent years" (p.ii).

The element of Florida's (2002) research most relevant to cities is the notion that the creative class, the drivers of the knowledge economy, are choosing to locate themselves in creative centres rather than traditional corporate communities, working class centres or sunbelt regions. Creative centres are places with thick labour markets, well developed and attractive urban amenities, and an urban culture characterized by the acceptance of diversity (Florida, 2002; Hospers, 2003; Bradford, 2004). Because of their high concentrations of creative class people and high creative economic outcomes, these centres seem to be the economic success stories of our age (Florida, 2002). Most importantly, they are thriving because creative people want to live there, not because of traditional indicators of economic viability such as access to resources, connectivity through ports and highways, and availability of jobs (Florida, 2002).

The part of Florida's (2002) argument that has been most widely accepted by urban policymakers is the suggestion that, once a sufficient pool of creative individuals has accumulated in a given place, a vibrant and dynamic local economy will naturally arise from the group's intrinsic entrepreneurial and creative energies. It follows then, from this perspective, that in order to ensure success, it is incumbent upon a city to use whatever assets it has to attract and retain the creative people who function as a catalyst to spur economic growth. This concept has intuitive appeal and, in light of the distinct lack of innovative ideas in recent urban policymaking (Harvey, 1989), civic leaders struggling to reconfigure their

cities in the face of the shift from industrial to knowledge-based economies have been quick to take it up (Chatterton, 2000; Peck, 2005).

Florida (2002) has observed that three conditions are necessary for a city to attract the knowledge workers that he refers to as the creative class. They are: talent, technology and tolerance16 (Florida, 2002). Florida (2002; 2003) defines talent as the presence of individuals with a bachelor's degree or higher, technology as concentration of innovation and high technology in a city-region, and tolerance as openness and inclusiveness of diversity. From these three conditions Donald and Morrow (2003) distil the 'talent model'. The talent model is comprised of the three components: a thick labour market (related to both the talent and technology conditions), cultural diversity and inclusiveness (related to the tolerance condition), and quality of place17 (related to attracting talent). The talent model tells us that, by catering to knowledge workers through urban amenities, a city can attract a pool of qualified talent sufficient to the expansion needs of its knowledge-based economic sectors.

---

[16] Florida's use of the word 'tolerance' to designate recognition and acceptance of both visible and invisible diversity is problematic. While tolerance fits neatly with technology and talent to make "the 3 Ts", a catchy and easily remembered way of encapsulating the pillars of Florida's theory, the word is increasingly considered to bear negative connotations. This is exemplified by UNESCO's 2007 workshop on World Cultural Diversity (report forthcoming). I have used the word 'tolerance' only to refer specifically to Florida's (2002) work. Wherever possible I have replaced the term with either 'inclusiveness' or 'acceptance of diversity'.

[17] Quality of place, in this instance is understood as the presence of desirable amenities such as an attractive natural environment, recreational activities, arts and entertainment.

2.4.1 Critiques of Richard Florida and Creative City Strategies

Despite the attractiveness and popularity of Florida's ideas, some areas of his work have been heavily criticised. Donald and Morrow (2003) divide these criticisms into two main categories: the first focuses on the adoption of his model in municipal policy without sufficient understanding of its real-life outcomes, and the second on the quality of his actual research.

To examine this first concern in more depth, there is the inherent problem of seeking to artificially create the authentic, culturally vital environment that Florida argues is attractive to the creative class and causes the creative economy to thrive (Donald & Morrow, 2003; Malanga, 2004). While Florida (2002) is clear in his description of the qualities that distinguish creative cities, he is less clear regarding the direct connection between these qualities and their ability to give rise to a successful urban economy. As Scott (2006) suggests, the simplicity of Florida's argument neglects the intricate synchronic and diachronic connections that must occur in a city before a dynamic and innovative environment is likely to emerge. There is a lot to urban socio-economic vitality that relies on specific timing and location, which is difficult if not impossible to predict, let alone simulate. In fact, even Florida admits that, despite a city's best efforts to foster creativity, there is no predicting exactly where creativity will take root and flourish (as cited in Peck, 2005). This validates the question of whether the simple presence of skilled, qualified and creative individuals is sufficient to foster an innovative milieu. Because of the failure to address this question, Florida's work falls prey to the simplistic and reductive perspective that Chatterton (2000) argues often characterizes regional and urban development when framed within the

creative city context. It is problematic when policy that focuses on attracting creative individuals is adopted without sufficient evidence to prove that this is an effective strategy for achieving the desired result of boosting economic vitality. For this reason, Glaeser (2004) suggests that urban policy makers would do better to focus on providing things like safe streets, good schools and low taxes, factors which are already linked to growth and known to be desirable to prosperous people.

In fact, little is yet known about the specific conditions that foster creativity, or the mechanisms, processes and resources necessary to turn ideas into innovation (Bradford, 2004; Stolarick & Florida, 2006). This lack of direct understanding reinforces the need for further investigation into the suggestion that the presence of creative people is sufficient to stimulate innovation. Based on Florida's (2002) research, a correlation (but not a causality) exists between the presence of the creative class and economic growth. It is still unclear exactly how these two factors (the presence of creative people and the vitality of a city's economy) interact. It is possible that there is another, as yet unidentified, variable that plays an equally instrumental role in ensuring the economic success of cities.

The second set of objections to Florida's argument involves a more direct critique of his research. Donald and Morrow (2003) raise questions regarding the data used to rate cities on various indices. The gay index is based on census figures of same-sex households which includes all households made up of two persons of the same gender, irrespective of their sexual orientation (Donald & Morrow, 2003). The talent index measures the number of people with bachelor's degrees and beyond but does not include other forms of post-secondary education, or informal forms of education (Donald & Morrow, 2003). The

melting pot index (also called the 'mosaic index' in some Canadian studies) measures the number of foreign born individuals but does not include the American (or Canadian in the case of Canadian cities) born racial or ethnic population (Donald & Morrow, 2003).

Donald and Morrow (2003) also suggest that Florida's (2002) research ignores life cycle and gender issues, as well as the relationship between income inequity, racial segregation/integration, and high-tech urban growth. Some of the most highly ranked creative places are also those with the most obvious forms of social inequality (Bradford, 2004; Peck, 2005). Because of this, Florida's work can be seen as contributing to a body of new economic work that goes against other recent scholarship looking at the conflict between entrepreneurialism and social justice18 (Donald & Morrow, 2003).

The last concern regarding the creative city concept that must be addressed here, is that Florida's ideas for enhancing creativity apply, for the most part, only to large cities which by virtue of their size are often already home to a large cosmopolitan, educated workforce (Bradford, 2004). This is similar to global cities research that has focused primarily on a select few of the largest of the world's cities at the expense of other urban regions (Robinson, 2005). By focusing research so narrowly its usefulness as a widespread contributor to urban policy is diminished and there are gaps left in our comprehension of the broader urban situation.

---

[18] The relationship between the growth of the knowledge economy and social polarization is an important issue facing urban policymakers today (Donald & Morrow, 2003; Peck, 2005; Bradford, 2007). The cities that rank highly on Florida's creativity index are also those with the sharpest social and economic polarization (Donald & Morrow, 2003; Peck, 2005; Bradford, 2007).

2.4.2 Despite the Criticism . . .

Although these important questions remain, a growing body of evidence supports the notion that creative activity plays a crucial role in shaping the character of a city (Gertler, 2004). Creative activity is seen to enhance innovative capacity and quality of place, and both are deemed necessary to attract and retain creative and skilled knowledge workers (Gertler, 2004). In light of this, there has been an increasing trend toward fostering the creative capacity of cities.

Cities thus seek to bolster their knowledge-based economies by nurturing a creative environment and by working to attract and retain creative individuals (Florida, 2002; Duxbury, 2004; Gertler, 2004; Scott, 2006). They also work to identify and develop niches in the global economy (Duxbury, 2004; Gospodini, 2006). In order to do either of these things, they must capitalize on their existing assets (location, geography, culture, skills and knowledge) and they must employ a multi-faceted approach to develop and use these assets to their advantage (Duxbury, 2004). This multi-faceted approach involves attracting and retaining mobile knowledge workers, investment, and jobs; improving quality of place through investment in infrastructure19 and amenities20; and building on unique local

---

[19] Access to efficient public transit is often cited as one of the key infrastructures looked at by creative individuals when selecting a city to live in (Florida, 2002). Toronto Mayor David Miller in his presentation to the CORIM (Le conseil des relations internationales de Montreal) on June 13th, 2007 entitled 'Relever les défis de la mondialisation: le rôle des villes', speaks repeatedly of the importance of transit and the necessity of establishing a national transit strategy in Canada.

[20] Florida (2002) suggests that knowledge workers look for amenities like a vibrant street life and café culture, access to arts and music through small independent venues, and the ability to engage in outdoor activities. What differentiates these things from the large-scale artificial spectacular consumption spaces described by Hannigan (2007) (sports stadiums, casinos, megaplex cinemas, virtual reality arcades, aquariums, themed restaurants, etc) is the feel of

identity and pride through branding and place marketing (Hospers, 2003; Duxbury, 2004; Waitt, 1999). For example, since the 1980s, Dublin has nurtured their high-tech industry through a program of urban regeneration aimed at creating the cultural milieu that is attractive to skilled knowledge workers (Graham & Marvin, 1999; Ó Riain et al, 2004). Further, when the Temple Bar area in Dublin emerged organically as an attractive inner urban district, the city supported its economic and cultural growth (Graham & Marvin, 1999).

Despite the prevalence of these movements, as Donald and Morrow (2003) suggest, the solution should not be to indiscriminately apply a 'creative city bandage'. Rather, they suggest that ailing cities should be treated with a combination of the creative city model, and the social policy objectives of promoting social and cultural inclusion and eliminating exclusivity (Donald & Morrow, 2003). To quote, "[t]he intersection of [Florida's] talent model and broader social policy is fundamental to creating and maintaining the necessary conditions for the economic success and well-being of Canada and its city regions" (Donald & Morrow, 2003, p.iii). Policies that combine economic opportunity and social inclusion21, policies that nurture cultural vitality in land-use and urban public space planning22, and

---

authenticity and the ability to participate actively in the experience. Florida (2002) argues that these qualities are essential to the creative process.

[21] According to Donald and Morrow (2003), policy that aims to achieve equality of economic opportunity must do three things. It must work to eliminate exclusion of people of diverse cultures, ethnicities, sexual orientations and abilities. They must also attempt to break down barriers for participation in the workplace though workforce re-entry training programs, income redistribution and educational upgrading. Finally, they must focus on improving cultural diversity and inclusion.

[22] Donald and Morrow (2003) identify important approaches to land development including mixed-income, mixed-use, housing developments (such as False Creek in Vancouver and St. Lawrence in Toronto), and the preservation of historic buildings and cultural landscapes

policies that promote social inclusion in day-to-day cultural consumption23 are suggested as more viable courses of action (Donald & Morrow, 2003). Although doubtful of their effectiveness, Peck (2005) tells us that attempts to combine creative city policies with more socially inclusive policies are already being implemented in the United Kingdom and Canada.

2.5 Government Roles in Canada

In order for these elements to come together to form a successful strategy, it is necessary to identify and coordinate the contributions of all three levels of government. There are a number of direct ways that governments can foster creativity. Among these are: the construction and operation of cultural facilities, provision of funds for arts programming, preservation of heritage sites and support for arts festivals and other special events (Donald & Morrow, 2003; Bradford, 2004). There are also a variety of less direct policy measures that all three levels of government can take to assist cities. While the importance of municipal government is the most immediate, provincial and federal policies do have a significant effect on the ability of a city to support its creative community. Especially since, as Toronto Mayor David Miller has stated "the success of our major cities will determine the

---

(which are increasingly recognized to regenerate and revitalize self-esteem in disempowered communities).

[23] Donald and Morrow (2003) use food as an example of the integration of social inclusion into everyday cultural consumption. They suggest that Vancouver, Montreal and Toronto are becoming globally recognized culinary capitals with food informed by over 150 different national cuisines. Further, programs like FoodShare, an organization that works to improve access to healthy and affordable food in Toronto, are an example of a non-profit organization that straddles entrepreneurial and social service sectors.

success of our country"24, it is in the best interest of federal government (and this holds true for provincial governments) to support major cities.

All three levels of government influence the vitality of cities. In the case of Canada, there has been criticism of both the federal and provincial governments for their lack of concern for urban issues (Bradford, 2007). In Canada there is no official urban agenda. The former Prime Minister Paul Martin sought to establish a federal urban policy agenda to ensure a stable long-term revenue stream for cities, encourage tri-level government collaboration, and to establish a framework to assess and to improve the outcomes of federal activities relating to cities (Bradford, 2007). When the current Prime Minister Stephen Harper came into power he put forward a very different urban vision. His vision required that the federal government step back and focus on its own jurisdictions (national defence, foreign affairs, border security and the economic union) only stepping beyond these domains on projects of 'national significance' (Bradford, 2007). This kind of ebb and flow in the support for urban issues from the higher levels of government is characteristic of Canada. However, as cities become increasingly important to the country's economy, it is incumbent upon the state to create a more coherent strategy (Bradford, 2007). After decades of neglect, the challenges that face major Canadian cities are significant, but not insurmountable (Brender et al, 2007).

As Gertler (2004) explains, federal policy must foster the health, prosperity and social stability of Canadians through support for the positive evolution of urban regions. The effect of federal cultural policy and regulation (ie. support for the arts, freedom of expression,

[24] Quoted from Toronto Mayor David Miller's presentation to CORIM (see footnote 19).

protection of intellectual property) have a direct effect on prosperity and vibrancy of the creative arts (Bradford, 2004, 2007; Gertler, 2004). Similarly, immigration policy impacts diversity and subsequently the capacity for inclusiveness of regions (Bradford, 2004, 2007; Gertler, 2004). These are all areas that are likely to have an influence on a city's ability to implement a creative city strategy.

In parallel, provincial policies regarding healthcare, education, social assistance and social housing play a key role in determining quality of life in a city region (Bradford, 2004; Gertler, 2004). Also, the ways that provincial governments shape land-use planning policies has a significant influence on cities(Bradford, 2004; Gertler, 2004). Further, they are responsible for ensuring that the unique and distinctive elements (heritage) of the existing urban fabric are preserved and strengthened, that the natural environment is protected, that employment and residential densities are high enough, and that alternatives to automobile travel (i.e. efficient public transit systems) are available (Bradford, 2004; Gertler, 2004). Again, these are influential areas that can either hinder or support the implementation of a creative city strategy.

Municipal policy affects many of the same areas as provincial policy. At this level, however, the connection between policy and its outcomes is more direct. Worldwide since the 1980s, there has been an increasing demand for civic governments to come up with new and more innovative approaches to policy (Harvey, 1989). In the 1980s and 1990s this manifested itself through the shift from a managerial to an entrepreneurial approach to governance (Harvey, 1989). This entrepreneurial model is characterised by public-private partnerships which are inherently entrepreneurial, and the construction of place rather than

territory25 (Harvey, 1989). In Canada, urban governments have been forced to develop new policy solutions due the lack of consistent support from upper levels of government (Andrew, Graham & Phillips, 2000). They have risen to the challenge through collaboration with private and volunteer organisations to implement innovative policy strategies (Andrew et al, 2000). An example of such innovative policies is the creative city strategy. Creative city strategies work well with the entrepreneurial model of urban governance as they build on similar notions of enhancing certain of a city's unique qualities in order to attract new residents and investment. They also sit well with liberal urban policy practices as they reaffirm the notion that social legislation and amenities are more important to the economic growth than tax incentives and business friendly policies (Malanga, 2004).

2.6 Some Approaches to Creative City Development

Duxbury (2004) outlines four approaches currently used by Canadian cities attempting to enhance various aspects of their creativity. First, the Innovative Knowledge City approach focuses on developing research and education centres that are internationally recognized (Duxbury, 2004). Montreal is employing an approach of this sort and, as a result, there is a distinct lack of emphasis on supporting arts and culture in the city's new vision statement (Duxbury, 2004). In this case, arts are valued for their ability to attract knowledge workers rather than as an intrinsic part of the knowledge and innovation milieu (Duxbury, 2004). Second, the Niche Economic Development approach, as seen in Saskatoon and St.

---

[25] Harvey (1989) distinguishes between the construction of place and territory. Construction of territory involves projects (relating to housing, education, etc) aimed at improving living and working conditions. Construction of place focuses on enhancing a place through projects like industrial parks, civic centres, and enhancing the conditions of a place by intervening in local labour markets, and by implementing retraining schemes.

John's, focuses on creating an international reputation for leading-edge research and industry in a few key industries (Duxbury, 2004). Third, the Local Community/Economic Development with a Cultural Component approach focuses on building better communities and local economies with priority placed on incorporating arts and culture into the city's official vision (Duxbury, 2004). Fourth, the Creative City approach being used in Ottawa (City of Ottawa, 2003), Toronto (City of Toronto, 2003) and Vancouver (Creative City Task Force, 2007) focuses explicitly on the inclusion of arts, culture and heritage in the future visioning and planning for the city (Duxbury, 2004).

Creative city plans like those we see in Toronto, Montreal, Ottawa and Vancouver, when used as a complement to larger strategies to build stronger regional economies are an important tool for developing thriving cities (Bradford, 2004; Gertler, 2004; Peck, 2005). These plans focus on the cities' individual culture, infrastructure, industry, identity and creative capacity, and capitalize on the cities' unique qualities (Gertler, 2004). Another important municipal policy initiative that can be taken as an example is the Toronto Act 2006, proclaimed January 1st, 2007 that establishes a framework granting the city more autonomy with regard to by-laws, land-use planning, and financial management (City of Toronto, 2007). This act enables the city to make necessary decisions unencumbered by its previous reliance on approval from higher levels of government (City of Toronto, 2007).

2.7 Beyond Government

In order for these strategies to be effective, it is also essential that a city have the will and the capacity to make the necessary changes (Duxbury, 2004). According to Duxbury

(2004), the most important enabling conditions and resources are: collective will to mobilize resources, take risks and persevere; resonance between the community's vision and its particular circumstances and possibilities, including local assets and restraints; the existence of strong community networks; strategic resources including money, people with expertise/skills/knowledge, and spaces for networking; time to allow plans to unfold over long periods, and timing, which may mean speeding up processes as opportunities arise, or delaying to a more opportune moment; and flexibility since implementing innovative policies is by nature experimental, and requires flexible approaches (Duxbury, 2004).

In addition to the active involvement of all three levels of government, non-governmental initiatives are essential in strengthening the social space and 'connective-tissue' necessary for creative activities to flourish (Gertler, 2004). Particularly important in creating sustainable creative communities are active arts communities (Gertler, 2004), university communities (Florida, 2002), and bridging organizations like Toronto's Artscape[26] that aims to fill the gaps left between policy planning and implementation.

2.8 Conclusion

This review of literature examined some of the major changes occurring in the contemporary city as a result of the development of ICTs. These changes range from social

[26] Artscape is a Toronto-based non-profit organization that builds creative communities and expands knowledge about the dynamics of creative places. Their work includes building creative places, developing creative districts & clusters, and cultivating creative cities. While it remains strongly connected to its roots in the arts community, it has built strong relationships with planners, economic developers, environmentalists and community activists, in order to bridge between the two distinct spheres. For more information, visit the Artscape website at http://www.torontoartscape.on.ca/.

(interaction and communication) to economic (the rise of the knowledge-based economy) to geographic (evolving urban form and the decreasing importance of space and the increasing importance of place) and suggest a paradigm shift from industrial city to cybercity. From this review, the question is raised regarding how urban governments should be acting with respect to the changes occurring in their cities. While certain policy mechanisms (in particular creative city strategies) have been implemented in response, the success of such strategies remains uncertain. This is where I will focus my research. By asking how municipal policy initiatives influence a city's transformation into a cybercity, I hope to better understand both the currents of change in the contemporary city and contribute to future policymaking.

3.0 Methodology

This chapter includes an overview of the research strategy employed in this thesis, a justification of the strategy, and a description of the selection of the study area, documents, data sources and research tools used.

3.1 Research Strategy: Overview

3.1.1 Research Question & Sub-questions

The objective of this research was to better understand the role of municipal policy visioning initiatives in the transformation of industrial cities into cybercities. In order to achieve this objective, the following research question was asked:

- **How do municipal policy initiatives influence a city's transformation into a cybercity?**

The following four research sub-questions are used as a guide in answering the above research question:

1. What is the major undercurrent of transformation occurring in contemporary cities?
2. What model identified in the academic literature plays a key role in current policy initiatives?
3. How is this model used in Montreal's policy initiative Montréal, Knowledge City: Report of the Montréal, Knowledge City Advisory Committee?
4. To date, has this policy initiative been successful in achieving its stated goals?

The research was carried out in four stages. What follows is a brief outline of each stage. Each of these four stages relates to one of the sub-questions used to answer the primary research question.

3.1.2 Research Strategy

Including the review of academic literature, the research was carried out in four stages. Each of these four stages related to one of the sub-questions used to answer the primary research question. The answers to the first two questions emerged directly from the academic literature, while the latter two were addressed through a case study built on unobtrusive research methods that included document analysis and archival work. The document analysis and archival work led to qualitative findings which were complemented by empirical evidence. The analysis of this body of data was largely qualitative. A qualitative approach was deemed appropriate for this exploratory study since it enabled themes and generalizations to be extracted from the collected data, and organized to present a coherent, consistent picture. What follows is a brief outline of each of the four stages of the research.

The first and second stages of the research were carried out primarily by engaging with a range of academic literature. For this reason, I will only touch on them briefly here. First, from the academic literature I identified the evolution of the industrial city into the cybercity. It is important to note that, while it is possible to identify the trends that occur during a city's evolution from industrial city to cybercity, the process of measuring such a

transition is complex and was not the primary focus of this research. Rather, for the purposes of this thesis, the transition from industrial city to cybercity was recognised as the overarching context within which the contemporary urban issues examined in this thesis could be explored.

Second, in order to understand the role of municipal policy visioning strategies in the transformation of industrial cities into cybercities, a link between the academic literature and the examined policy documents was sought. This stage of the project involved identifying some current municipal policy visioning initiatives, and isolating the academic model or models that formed their roots.

The third and fourth stages of this thesis required a more developed methodology. A case study approach was selected because it enabled the examination of a single situation in which Florida's (2002) talent model was applied. This approach made possible an in-depth look at several trends shaping a particular city. As Walton (1992) states, "[t]he logic of the case study is to demonstrate . . . how general social forces shape and produce results in particular settings" (p. 122). Consequently, by considering the specific context of a case (the emergence of the cybercity) and the configuration of its parts, the defining characteristics of the cybercity were revealed, and the patterns of the case as a whole were established. By examining a single city, my exploratory study was able to engage in a deeper analysis of the forces shaping the emergence of the cybercity.

Qualitative document analysis and archival work were selected as the central pillars of the case study component of this thesis. The document analysis component enabled the

main themes that run through the documents to be elucidated. After isolating these themes it was possible to compare them to the academic literature in order to determine the ways in which academic literature, official discourse and policy development converged and diverged.

The document analysis component of the thesis was complemented by an archival component. The archival work conducted in this thesis included an examination of industry reports, government statistics, the official websites of organisations that support research and innovation, and the official websites of major cultural institutions. The object of the archival work was to locate real-life evidence to support the themes isolated in the document analysis. As a result, the archival work was focused in the areas identified in the document analysis and served to verify the presence of those qualities that characterise a creative or knowledge city.

3.1.3 Hypotheses

Based on the academic literature reviewed, I postulated that municipal policy visioning initiatives currently being implemented, particularly creative city strategies, would have only a minor influence on a city's transformation into a cybercity. While these policy initiatives might serve to foster some elements of cybercity development, their current scope was unlikely to be broad enough to foster cybercity development as a whole.

In the case of Montreal, I anticipated that *Montréal, Knowledge City* would repeat at least some of the deficiencies found in Florida's talent model. I anticipated this because,

from my initial reading of the document, its theoretical foundation appeared to rely almost exclusively on Florida's work. Instead of drawing on the diverse work and experience of other urban theorists to shore up those areas where Florida's work is most often criticised, I predicted that Montreal policy-makers had focused too narrowly and missed the opportunity to develop and adopt a truly innovative policy strategy.

3.2 Justification of the Research Strategy

The research strategy employed in this thesis was designed in four stages to reflect the four research sub-questions used to answer the primary research question. This strategy enabled me to rely on existing academic literature to answer the initial questions while assembling a case study from policy documents, industry profile reports, provincial government statistics and information about research and cultural organisations in the Montreal region, to answer the subsequent questions. The strategy followed a progression from broad to narrow focus in order to isolate the elements needed to answer the overall research question.

Document analysis and archival work were selected as the central components of the case study because the research question pertained directly to the policy visioning document and its implementation. These unobtrusive methods were selected because they permitted a direct analysis of the message presented by the authors of the document *Montréal, Knowledge City*. This document was specifically intended to be used as a resource for the creation of concrete guidelines for future policy, and this method of analysis permitted a simulation of how future policymakers might interpret the document.

By isolating the stated intentions and assertions of *Montréal, Knowledge City* I was able to compare this policy visioning initiative to the academic model that it stems from, and to the effect it has had on Montreal. By looking both to the academic literature that supports it, and to the results of its implementation, I was able to bridge from the scholarly literature, through policy, to real-life outcomes tracing the concept of the creative city as it diffuses through these domains.

Other research on creative cities, particularly that of Richard Florida (for example Florida, 2002; Stolarick & Florida, 2006) has used interviews and focus groups as the primary means of data collection. I have chosen not to replicate this methodology for three reasons. First, Stolarick and Florida (2006) have already published an interview and focus group based study dealing specifically with the capacity of the Montreal region for creativity. While their study touches on issues that are relevant to my project, the focus is not the same, and thus neither are the findings. By examining a related but distinct area, I ensure that my research elicits different material regarding the development of Montreal as a creative city. Further, my findings, as they relate to existing studies, can be easily situated in the larger framework of current scholarship in this area. By employing the approach I have selected, I ensure that I am not replicating existing work, and am able to make a coherent contribution to the current body of knowledge.

The second reason relates more directly to the nature of this research. While a series of qualitative interviews provides valuable information regarding the experiences and perceptions of creative individuals, it does not treat policy documents directly (although it

would provide relevant information regarding the writing and implementation processes), nor can it empirically measure the success of a creative city strategy. Document analysis permits the message of the authors of the policy visioning initiative as it was presented in the document to be examined directly. Thus, in order to address the specific questions driving this research, a systematic analysis of relevant documentary evidence was deemed the most effective strategy.

Third, one of the objectives of this research is to contribute to future urban policymaking. In order to do this, a thorough understanding of the advantages and disadvantages of the current policy, and the issues surrounding it, is necessary. In order to establish this level of fluency, it is valuable to take a different approach from that which generated the policy in the first place (in this case, interviews and focus groups played a key role). The intent here is that by taking a new perspective I will either highlight the deficiencies in the existing strategy or reaffirm its strengths.

3.3 Study Area, Document Selection & Data Sources

Montreal was the city selected as the lens to focus this research, and what follows is an outline of how it was selected. Following that is a discussion of the documents selected for analysis (*Montréal, Knowledge City, Life Science: The Metro Montréal Cluster: Strategic Profile of a Success Story, The Metro Montréal Aerospace Industry* and *Metropolitan Montréal's Information and Communications Technology Industry*) and all additional data sources used.

Montreal was selected as the area of study for three reasons. First, it was selected because of the recent policy visioning initiative *Montréal, Knowledge City* and the subsequent industry profile reports (*Life Science: The Metro Montréal Cluster: Strategic Profile of a Success Story, The Metro Montréal Aerospace Industry* and *Metropolitan Montréal's Information and Communications Technology Industry*) published by Montréal International to raise awareness of the status of Montreal's knowledge-based industries. *Montréal, Knowledge City* is a policy visioning initiative which aims to foster a cultural infrastructure that sustains innovative activities, and works as an inducement for companies and company headquarters to settle in Montreal.

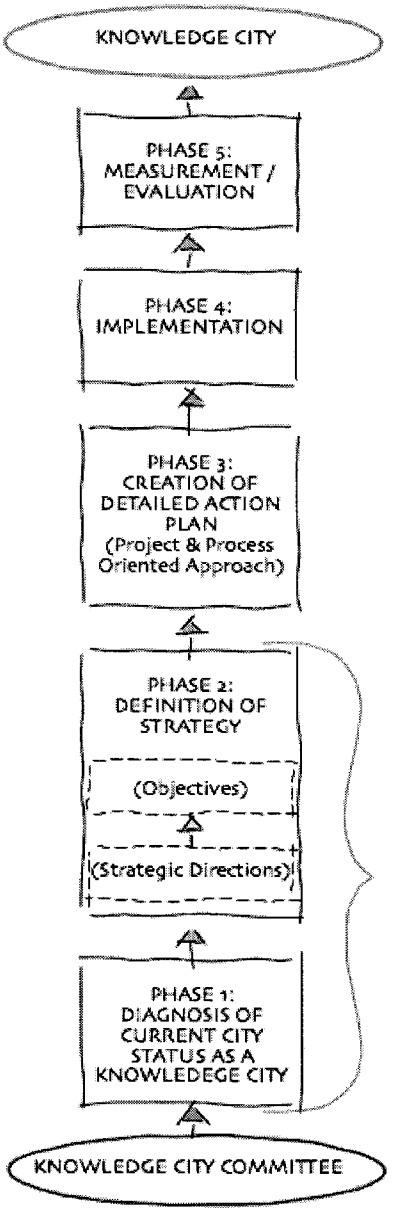
Second, Montreal was selected because it has a growing knowledge-based sectors (particularly in aerospace, life sciences and ICTs) that they wish to support and enhance. The presence of such knowledge-based sectors and the will to support them is characteristic of a creative or knowledge city. The presence of these sectors contributes the real-life evidence needed to support the document analysis component of the research.

Third, because of Montreal's unique history of bilingualism and its cultural diversity, its population density and its concentration of universities and research centres, the city is advantageously situated to become a crucible for innovation, stimulating the regional economy. It meets many of the criteria espoused by Florida's (2002) talent model and will consequently make a valuable case by which to examine the application of this model to a policy visioning initiative.

The documents examined in this study were selected in tandem with the study area as it was necessary for the selected city to be in the process of implementing a creative city policy visioning initiative. *Montréal, Knowledge City, Life Science: The Metro Montréal Cluster: Strategic Profile of a Success Story, The Metro Montréal Aerospace Industry* and *Metropolitan Montréal's Information and Communications Technology Industry* were considered particularly appropriate documents for this study because all four were commissioned by Montréal International. Montréal International is an organisation that seeks to contribute to the economic development of Metropolitan Montréal and to increase the region's international status through collaboration with the Government of Canada, the Government of Québec, the Communauté métropolitaine de Montréal, the City of Montreal and private companies. This increases the consistency of the data sources and ensures a more accurate comparison between statistics than if the data came from a number of different sources.

Montréal, Knowledge City was written by the Montreal Knowledge City Advisory Council as a result of the visioning exercises conducted at the Montreal Summit in 2002. The mission of the advisory committee was to describe the city's status as a knowledge city and to suggest strategies for future action. *Montréal, Knowledge City* was written to advise future civic policy and to provide the guidelines necessary for the establishment of Montreal as a knowledge city. Based on the model developed by Ergazkis, Metaxiotis, Psarras & Askounis (2006) (see Figure 3.1), the policy visioning initiative contributes to phase one (diagnosis of current city status as a knowledge city) and phase two (definition of strategy) of knowledge city development. *Montréal, Knowledge City* should thus be understood as background policy rather than implementation policy.

Figure 3.1 – The Phases Involved in Developing a Knowledge City



(Source: Ergazkis, Metaxiotis, Psarras & Askounis, 2006)

Other than the four documents listed above, a selection of archival sources were consulted to provide supporting evidence. These sources include: Statistics Canada (2001 and 2006 Census), Québec Ministry of Education Statistics, Institut de la statistique Québec (research and development figures), National Research Council of Canada (information on

the SSHRC, NSERC and CHIR Canada Research Chairs), the official websites of a number of organisations that support research and innovation in the Montreal region (see Appendix D for a complete list), and the official websites of major cultural institutions in the Montreal region (see Appendix D for a complete list).

3.4 Research Tools

The research tools used in this thesis are described here. They include: the grid of cybercity characteristics, Richard Florida's talent model and the indicators of a knowledge city as defined by *Montréal, Knowledge City*.

3.4.1 The Grid of Cybercity Characteristics

The grid of cybercity characteristics (see Appendix C) was developed through an exhaustive review of relevant academic literature. It organizes the literature based on the relevant concepts, gives practical examples of the concepts, and states the importance of each contribution to the cybercity concept.

The grid was used to establish the main trends in the evolution of industrial cities into cybercities, and was essential in providing the foundation from which to launch the subsequent document analysis.

3.4.2 Richard Florida's Talent Model

In his book *The Rise of the Creative Class,* Florida distils the necessary conditions for cities to attract creative people and stimulate innovation and economic growth technology down to three simple concepts: talent, technology and tolerance[27]. Donald and Morrow (2003) explain the three components of this model, which they call the 'talent model': desirable amenities (such as an attractive natural environment, recreational activities, arts and entertainment), a thick labour market, and cultural diversity and inclusiveness (Donald & Morrow, 2003).

This model was used to bring to light the strengths and weaknesses of *Montréal, Knowledge City.* This is done through a comparison of the policy report, the model, the critiques of the model found in the academic literature, and the various data collected.

3.4.3 'Montréal, Knowledge City' Indicators

At the outset of the report *Montréal, Knowledge City*, the term 'knowledge city'[28] is defined and Montreal as situated within that framework (as previously mentioned, knowledge cities like creative cities are cities characterised by their intense and continuous

---

[27] As mentioned in the literature review, Florida's use of the word 'tolerance' to designate recognition and acceptance of both visible and invisible diversity is problematic. Refer to footnote 16 for a description of why.

[28] The concept of 'knowledge city' is closely related to that of 'creative city'. As stated in the literature review, Duxbury (2004) distinguishes between the two by describing the knowledge city as a city that focuses on developing research and education centres that are internationally recognized, while a creative city is a city that focuses more on the promotion of arts, culture and heritage. Despite this distinction, I have chosen to follow Florida's (2002) conception of creativity and include both Duxbury's (2004) creative city and knowledge city under the umbrella of creative city.

knowledge production). The majority of a creative city's economic activity, including its key industries, are based in creative and knowledge-based sectors, with a high concentration in areas like research and development, and strategic management. Intense and continuous knowledge production is necessary in a creative city. In order to maintain that, it is essential to foster the development of human capital, and to invest in attracting and retaining both qualified immigrants and new knowledge-based companies. These three areas are the primary indicators of the creative city. They will be used to measure Montreal's capacity to be a successful creative city.

The three key indicators of a knowledge city (and by my definition also a creative city), defined in *Montréal, Knowledge City,* and the main data sources used to assess them are:

- key industries in knowledge-based and/or creative sectors – industry profile reports;
- intense and continuous knowledge production – list of centres, organizations, universities, festivals;
- qualified and talented pool of human capital – government statistics.

The indicators of a knowledge city were used in two ways: first to structure the document analysis and archival work conducted as part of the case study component of this thesis; second as the criteria by which it could be determined whether Montreal could be considered first a successful creative city, and second a cybercity. While they do not enable the measurement of the city's change over time, they do permit a snapshot to be taken of Montreal as it is now.

3.5 Summary

The data used in this study come from policy documents, industry profile reports, government statistics and official organization websites. The major methods employed in constructing the case study are document analysis and archival work. The qualitative document analysis is supported by qualitative analysis of data from government statistics and a overview of major research and cultural institutions' websites. In the following chapter I proceed to accomplish the steps outlined above.

4.0 Results & Discussion

Chapter Four presents the information used to determine how municipal policy visioning initiatives influence a city's transformation into a cybercity. The chapter is divided into three parts. Working from the context of urban transformation established in the literature review, the first part of this chapter provides an overview of Montréal, Knowledge City, Report of the Montréal, Knowledge City Advisory Committee29 followed by a critical comparison of this document to Florida's (2002) talent model. The second part summarises the empirical findings that support Montreal's transformation into both a creative city and a cybercity. This part is further divided into three sections to follow the three indicators used to measure Montreal's development as a cybercity and a creative city. The indicators are: key industries in knowledge-based and/or creative sectors; intense and continuous knowledge production; and a pool of qualified and talented human capital. The third and final part of this chapter analyses the findings from the previous two parts, linking them to the academic literature reviewed in Chapter Two to illustrate that it remains difficult to measure whether Montréal, Knowledge City has been successful in achieving its stated goals.

Please Note: Throughout this chapter a number of research and development centres, organisations that support innovation, and cultural institutions are mentioned. The descriptions of them are based on information from their websites. Their URLs are listed in Appendix D.

---

[29] Hereafter referred to as *Montréal, Knowledge City.*

4.1 Montreal & the Talent Model

4.1.1 Overview of Montréal, Knowledge City

After the Montreal Summit30 in 2002, the City of Montreal, in collaboration with Montréal International, set up the Montréal, Knowledge City Advisory Committee. The purpose of this committee was fourfold: first, to ascertain the conditions leading to successful knowledge cities and knowledge-based economies; second, to isolate the specific challenges facing Montreal in its development as a knowledge city; third, to better understand the expectations that Montreal knowledge workers have of the city; and finally to analyse the practices of other city-regions currently recognised as successful knowledge cities. The findings of the committee were published in 2003 in the report Montréal, Knowledge City.

The report Montréal, Knowledge City, begins by defining the term 'knowledge city' and placing Montreal within that framework. As previously mentioned, a knowledge city, like a creative city, is a city characterised by its intense and continuous knowledge production. The majority of such a city's economic activity, including its key industries, must be based in creative sectors, with a high concentration in areas like research and development, and strategic management. Intense and continuous knowledge production is necessary in a knowledge city, and, in order to for this to be maintained, it is essential to foster the development of human capital and to invest in attracting and retaining both

---

[30] The Montreal Summit held June 4th to 6th, 2002 was an extensive consultation process that aimed to establish a consensus regarding the priorities of the newly merged city of Montreal. Five visions of Montreal linked to the notion knowledge city developed. They are: Montreal as a centre for creation and innovation open to the world; Montreal as a centre for sustainable development; Montreal as a pleasant metropolis to live in, united and welcoming; Montreal as a metropolis of democracy, fairness and accountability; Montreal as a high performance administration working for the people (Brault & Quintas, 2002).

qualified immigrants and new knowledge-based companies. The concept of 'knowledge city' is closely related to that of 'creative city'. Duxbury (2004) distinguishes between the two by describing the knowledge city as a city that focuses on developing research and education centres that are internationally recognized, while a creative city is a city that focuses more on the promotion of arts, culture and heritage. As might be expected from the title of the report Montréal, Knowledge City, based on Duxbury's (2004) definitions, Montreal falls more into the category of knowledge city than that of creative city. Despite this, it is important to also consider Montreal as a creative city from the perspective of Florida's (2002) ideas of creativity and the creative class. From this perspective both the knowledge city and the creative city as they are defined by Duxbury (2004) fall within the category of creative city as defined by Florida (2002).31

Building on this definition of the knowledge city, the committee next identified four central indicators for measuring the performance of knowledge cities. The indicators are:

1. economic performance;
2. quality of the innovation process;
3. availability and skill level of human capital;
4. richness of cultural and social assets.

The committee used these indicators and a series of interviews with Montreal knowledge workers to determine that, although Montreal is in a solid position to become a successful knowledge city, it still faces significant challenges to fully realise this potential.

---

[31] Throughout the analysis of *Montréal, Knowledge City* the term knowledge city is used as in the report. Its meaning is taken to be essentially the same as creative city from the perspective of Florida (2002).

Looking at Montreal's situation in detail, the committee found a range of obstacles to the city's development as a knowledge city. According to Montréal, Knowledge City, the main impediment is the small size of the city's existing pool of knowledge workers. Knowledge workers, as defined in the literature review, are individuals whose jobs require high levels of knowledge and strong creative abilities. They are generally people employed in information and communication technologies, architecture, engineering, science, education, the arts, design, health care, management, finance, legal affairs, and marketing. In Montreal, although there is some concentration of these individuals, their numbers have not reached the critical mass necessary to attract and retain significant numbers of new knowledge workers. Further, while the city performs well in some creative fields like architecture and design, it falls short in other important areas like finance, accounting and management consulting. Among Montreal's other weaknesses are the city's difficult tax situation, its declining physical infrastructure, its political milieu, the limited number of jobs available, its education system (which does not necessarily allow the children of knowledge workers to learn in their language of choice), and its harsh winter climate. While individually none of these issues would be sufficient to prevent Montreal from attracting more knowledge workers, together they become problematic.

In addition, the report suggests that the city is not sufficiently focused on enhancing its existing cultural, intellectual and economic assets. In terms of cultural assets, Montreal is home to a rich array of cultural organizations including the McCord Museum of Canadian History, the Montreal Museum of Decorative Arts, the Montreal Museum of Fine Arts, the Musée d'art contemporain de Montréal, the Quebec Cinemathèque and the Canadian Centre for Architecture. Montreal also hosts over 50 festivals and major cultural and sports events

every year, including the Montreal International Jazz Festival, the Just For Laughs Comedy Festival and the Montreal Grand Prix Motorcar Race. Bridging between the cultural and intellectual realms, Montreal is known for its interdisciplinary atmosphere. This is exemplified by organizations like the Society for Arts and Technology and the Daniel Langlois Foundation, both of which support innovative projects that involve the juxtaposition and intersection of disparate knowledge-based disciplines (Michaud & Tcheremenska, 2003). Montreal's intellectual assets also include the four major universities located in the city: McGill University, Université de Montréal (and its affiliates the École Polytechnique and the École des Hautes Études Commerciales [HEC]), Concordia University and Université du Québec à Montréal. In terms of its economic assets, Montreal is already internationally recognised in two knowledge-based sectors: life science and aerospace. The advisory committee thus suggested nurturing and reinforcing these two sectors since they form the backbone of the city's knowledge-based economy. The report lists Montreal's other assets as: the city's high standard of living, its low housing costs, its short commutes, and the accessibility and diversity of outdoor and cultural activities.

Montréal, Knowledge City also looks at a number of other knowledge cities32 and would-be knowledge cities worldwide to identify key factors contributing to their success and/or failure. By identifying the successful and the unsuccessful aspects of aspiring knowledge cities, the report attempts to prepare Montreal to chart a successful passage through the obstacles it faces. As mentioned in the report and in the academic literature surveyed, over the past number of years, numerous cities worldwide have attempted to enhance their development in the areas characteristic of knowledge cities (described above

[32] In particular: Austin, Dublin, and Singapore.

as: economic performance, quality of the innovation process, availability and skill level of human capital, and richness of cultural and social assets). According to Montréal, Knowledge City, these initiatives tend to focus on three things: fostering strong knowledge-based economies, developing a knowledge culture, and investing in the kinds of urban infrastructure and amenities that attract and retain knowledge workers. These amenities are identified as: access to efficient public transit, a vibrant street life and café culture, access to arts and music through small independent venues, and the ability to engage in outdoor activities. While some cities have been incredibly successful at developing these amenities, others have not, and a significant portion of Montréal, Knowledge City is devoted to establishing an understanding of the successes and pitfalls experienced by other cities.

The five characteristics of successful knowledge city development identified in Montréal, Knowledge City are: a sense of urgency that change is necessary; a front-line role assumed locally by both public- and private-sector players; the exploitation of targeted development opportunities; massive state investment accompanied by the sustained pursuit of goals; and a focus on the basic prerequisites for growth in knowledge-based economies which are the social and technical infrastructures allowing knowledge workers to live, work and play (Michaud & Tcheremenska, 2003). These five characteristics come together as the driving force behind a successful application of a creative city strategy. They are consistent with the academic literature reviewed, particularly with the assertions of authors such as Duxbury (2004) who advocates the necessity of collective will to drive the adoption of broad urban policy initiatives like knowledge city and creative city strategies; Gertler (2004) who suggests that partnership between government and non-government groups is essential to support the implementation of such strategies; as well as Florida (2002), Bradford (2004) and

Scott (2006) who assert the importance of attractive urban amenities and quality of place to knowledge workers.

In contrast to the characteristics of a successful knowledge city, the authors of this report identifies a number of potential pitfalls. First they caution against the redevelopment of districts in a way that focuses primarily on attracting tourism instead of enhancing the urban environment for all of the city's residents (the redevelopment of Baltimore's port area is cited as an example of this). Next they assert that the construction of new infrastructure aimed at fostering technology clusters, which fail to consider the complexity of knowledge-based sectors (for example, infrastructure and developments that seem artificial, that bring together people who are not working in similar knowledge areas, and/or do not consider the multidisciplinary nature of those areas), must be avoided. In addition, they wrote that investment must not be made in infrastructure of the past (such as sports stadiums). Further, a lack of focus on the intensity and quality of knowledge production, including failure to value existing knowledge and cultural organisations must be avoided. Last, the city must focus on attracting knowledge workers themselves, rather than pursuing the traditional economy-building techniques of attracting businesses.

The report, Montréal, Knowledge City, concludes by identifying four areas that the advisory committee suggests Montreal focus on to strengthen itself as a knowledge city. The ideas embodied four areas can be traced not only to Florida's (2002) work, but also to the work of a number of other urban scholars such as Jacobs (1961; 1984), Donald and Morrow (2003), Bradford (2004), Duxbury (2004), Gertler (2004).

The first of these areas to be targeted is the innovation process itself. The innovation process transforms raw intellectual capital into useable innovations. It is suggested that the innovation process might be improved through a combination of enhanced marketing of university and government research facilities, and a variety of financial initiatives, including greater involvement of the private sector in supporting the development of the city as a whole. This means that initiatives to make research facilities better known and more accessible, as well as greater involvement on the part of private groups in the welfare of the city can play an important role in improving the city. Bridging organizations like the various centres for excellence33 located in Montreal create essential strategic partnerships that foster innovation and enhance the innovation process. The second area for improvement relates to education. Improving education facilities, programs and networks in Montreal is essential to the development of human capital. Third, it is noted that the city must streamline the immigration process so that it can increase the number of talented and qualified immigrants it attracts and retains. Last, the report suggests that it is essential for Montreal to identify and target specific areas of excellence, and to focus on supporting and enhancing those areas. The committee suggests that the existing media/entertainment, biomedical and aerospace sectors would be ideal areas of focus.

Each of these four areas is one piece in the puzzle of Montreal's development as a knowledge city. While efforts in any one area would benefit the city, according to Montréal, Knowledge City, a concerted effort in all four areas is necessary to ensure that Montreal has the best possible chance at becoming a successful knowledge city. Together these four areas

---

[33] The Centre for Excellence in Women's Health, the Centre for Excellence in Brownfields Rehabilitation, and the Centre of Excellence in Pharmacogenomics are some of the centres for excellence located in Montreal.

form the kind of multi-faceted approach to knowledge city development that Duxbury (2004) claims is essential to successful creative city (and knowledge city) development.

4.1.2 Montréal, Knowledge City & the Talent Model

To recap, Florida's (2002) talent model relates to cities in that it offers an innovative way for cities to make themselves more competitive in the knowledge-based economy. This model is based on the argument that knowledge workers more often seek employment based on the qualities of the city in which the firm is located, rather than on the qualities of the firm itself. This means that knowledge workers are more likely to locate themselves in cities they find appealing, and this, in turn, influences the success of certain cities and city-regions over others. The talent model, as it is described by Donald and Morrow (2003), is understood to include attractive amenities (natural environment, arts, local culture, recreational activities), a thick labour market, and cultural diversity and inclusion.

Montréal, Knowledge City incorporates Florida's (2002) ideas into its core, and by commissioning that report, Montreal and its urban elites have not only acknowledged the potential influence of the phenomenon expressed by Florida's model, but have also begun to explore the specific implications it has for their city. Florida's (2002) work on the creative class is specifically cited on numerous occasions throughout the report, and it underpins the assertion that one of the city's main goals ought to be attracting knowledge workers. While Florida's ideas breathe new life into Montreal's municipal policy, they also open the door to the same criticisms that have been made of his work. Most importantly, despite the opportunity to select the best of Florida's work and combine it with more socially oriented

planning policies, it seems that Montréal, Knowledge City has been unable to propose a strategy that bridges these areas and makes use of their more relevant components.

According to Montréal, Knowledge City, the primary obstacle to Montreal's future development is the small size of its existing pool of knowledge workers. Here we find Florida's assertion that the accumulation of creative people will stimulate the economy, and it is on this point in particular, that the report falls prey to some of the same criticisms as Florida's work. As was explained in Chapter Two, the connection between the presence of creative people and a successful knowledge economy is not well understood. There are key questions pertaining to this assertion that remain unanswered. What is the catalyst that will make this pool of creative people come together to build the kind of creative community that will foster the creative economy? What must be done to channel the raw talent in such a way that creativity can be transformed into innovation? As a result of this, an over-reliance on attracting creative people to Montreal as a means of stimulating the economy appears to be flawed. It is not a solid foundation on which to build a city's visioning strategy.

In order to illustrate Montreal's strength as a knowledge city, the report draws on Florida's (2002) work on the creative class. Montreal is favourably positioned on the talent index34, the melting pot or mosaic index35, the bohemian index36 and the tech pole

---

[34] The talent index is based on the percentage of people over the age of 18 with Bachelor's degrees or higher in a city (Gertler et al, 2002).

[35] The mosaic index is the Canadian version of the melting pot index (used in the United States). It is based on the percentage of foreign-born individuals in a city (Gertler et al, 2002).

[36] The bohemian index is based on the percentage of individuals employed in artistic and creative fields in a city. This percentage is compared to the city's share in the region's bohemians and the region's share in the country's bohemians (Gertler et al, 2002).

index37. Using these rankings as supporting evidence, the report claims that Montreal is currently favourably positioned as a knowledge city. While these rankings clearly show that Montreal compares favourably to other North American cities based on these indices, it is important to recall the critiques of the indices brought up in the literature review. Although the indices give insight into the phenomena they purport to measure, they are not comprehensive measures. Rather, they should be considered as signposts for future research.

The 'melting pot' or 'mosaic' index can be taken as an example. This index measures the number of 'foreign-born' individuals in a city, and does not include 'Canadian-born' ethnic or racial groups. In the context of Canada, a country built on successive waves of immigration, this is potentially a reductive way of measuring diversity. The status of 'foreign-born' gives little indication of an individual's level of integration into Canadian culture or their identification with it. Within the context of Montreal, this issue becomes even more pointed. Montreal is a city characterised by an historical mix of French-Canadian and English-Canadian residents, and, is a site of ongoing struggle between these two groups. While these groups are not wholly distinct from each other, they typically define themselves through their exclusion from the other group. The presence of the two language groups (neither of which can be identified or measured by the melting pot index) contributes significantly to the rich atmosphere of the city. Regardless of the extent of the influence of these two groups on Montreal's diversity (something I do not propose to measure here), it is undeniable that this is an aspect of the city that ought not to be overlooked when measuring its diversity. While Florida's melting pot index may indeed measure something that

[37] The tech-pole index is based on an index created by the Milken Institute that measures the high technology industrial output of a city (Gertler et al, 2002).

correlates with the attractiveness of a city to creative individuals (perhaps a correlation between the attractiveness of the city to foreign-born individuals and its attractiveness to creative individuals), it is not a clear indication of a city's diversity.

Another crucial downfall of Montréal, Knowledge City is that it overlooks important social welfare issues pertaining to gender and age, as well as the relationship between income inequity, racial segregation/integration, and high-tech urban growth. The report focuses largely on fostering economic renewal, and overlooks other equally, if not more, important measures of a city's success, such as social and environmental sustainability and cultural resources. The rationale for omitting these issues is that the improvements to the city that result from efforts to attract knowledge workers will benefit all of Montreal's residents. While this is a pleasant proposition, empirical evidence in other cases does not support this assertion (Donald & Morrow, 2004). Florida's focus on high-end talent ignores certain less advantaged groups like seniors, single parents and even artists. These groups often struggle as they are pushed out of districts undergoing the revitalisation and gentrification thought to make the city more appealing to knowledge workers. Further, to reiterate Peck's (2005) criticism, those places that rank highly on Florida's creativity index are also some of the cities with the most social inequality. This begs the question of why there is so little concern for the potential to recreate the less desirable aspects of other creative cities. It seems distinctly possible that enhancing a city's capacity to attract creative people in ways suggested by the talent model may actually decrease some kinds of diversity while accentuating existing patterns of socioeconomic disadvantage.

The issues raised here call for greater scrutiny of Florida's talent model and its application in practical terms. While there is an increasing body of work that supports the suggestion that creative activity enhances a city's economic potential, cities implementing creative city strategies must be aware of the weaknesses of the model. As is suggested by Donald and Morrow (2003), creative city strategies work best as a complement to other social policies that promote social and cultural inclusion, and support sustainable land-use, infrastructure and urban public space planning. This means that while a report such as Montréal, Knowledge City serves as a useful exploration or feasibility study to determine the viability of this avenue of urban development, it cannot be the sole driving force of Montreal's self-improvement efforts. Montreal is becoming less affordable to certain segments of the creative class (namely artists who tend to have a lower and less stable income than other members of the creative class) (Donald & Morrow, 2003). As the cost of living in Montreal rises, the gap between different socio-economic groups grows, further disadvantaging already underprivileged groups. In some ways Montreal is working to attract one kind of creative worker at the expense of another.

This brings us back to Donald and Morrow's (2003) assertion that in order for creative city strategies to succeed in Canada they must encompass both Florida's (2002) ideas and broader social policies that balance economic opportunity and social inclusion, foster cultural vitality in land-use and urban public space planning, and promote social inclusion in day-to-day cultural consumption. While the talent model can be seen as an important complement to the above mentioned social policies, it is essential to understand that, in and of itself, it does not constitute a complete, all-encompassing urban visioning strategy.

4.2 Mapping Montreal as a Creative City

In order to map Montreal as a cybercity and a creative city, three indicators were used as measures: key industries in knowledge-based and/or creative sectors, intense and continuous knowledge production, and a qualified and talented pool of human capital. In the case of Montreal, all three of these can be shown to exist, however, without the direct comparison of each measure to other cities, it is difficult to make claims regarding the city's success as a cybercity and as a creative city.

4.2.1 Montreal's Key Knowledge-Based & Creative Industries

Montreal's economy has important sectors in aerospace, life sciences, and information and communication technologies (ICTs). All of these sectors are knowledge-based industries, or rely heavily on knowledge-based activities. While all three of these sectors have manufacturing and service components, what makes them important knowledge-based sectors is their research and development component. When comparing employment in these areas to other North American cities, Montreal ranks well for its population according to Montréal, Knowledge City. Montreal is ranked fourth in North America in overall technology sector employment per capita, second in aerospace employment, third in biopharmaceuticals, and fourth in ICT employment (Michaud & Tcheremenska, 2003).

What follows is a brief outline of each industry in Montreal, including the structure of the workforce, and the major employers in each sector.

4.2.1.1 The aerospace industry38

In 2003 there were approximately 37,800 people employed in the aerospace industry in Montreal, including approximately 5,700 engineers and scientists, 6,300 technicians, 19,400 operators and 6,400 administrators.

Overall, the aerospace industry can be divided into three sectors: prime contractors and overhaul/repair centres such as Bombardier Aerospace, Pratt & Whitney Canada, CAE, Rolls-Royce Canada, Bell Helicopter Textron, Air Canada and Air Transat; equipment manufacturers such as CMC Electronics, EMS Technologies Canada, Héroux-Devtek, Honeywell Aerospace, Messier-Dowty, Lockheed Martin Canada, and Thales Avionics Canada; and various subcontractors who provide a variety of special products and services including machining, avionics, metal treatment, composites, fasteners, tools, and cabin interiors. The distribution of companies and jobs across these three sectors is as indicated by Table 4.1.

---

[38] Unless otherwise indicated, all findings pertaining to the aerospace industry are taken from Montréal International (2003b), *The Metro Montréal Aerospace Industry.*

Table 4.1 Aerospace Industry Breakdown

(Data source: Montréal International 2003b. All percentages are rounded.)

Sector	Companies	Jobs
Prime Contractors & Overhaul/Repair Centres	7 (4%)	29,000 (77%)
Equipment Manufacturers	7 (4%)	2,900 (8%)
Subcontractors	144 (91%)	5,900 (16%)
TOTAL	158	37,800

Montreal is home to the headquarters of a number of international organizations that help to ensure a dynamic and stimulating environment for the aerospace sector. Among them are the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), the Société internationale de télécommunications aéronautiques (SITA), the International Federation of Air Traffic Controllers' Associations (IFATCA), and the Conseil international de formation aérospatiale (CIFA). Also located in Montreal are the Centre for Aerospace Manpower Activities in Quebec (CAMAQ), and two industry specific schools: the École des métiers de l'aérospatiale de Montréal (ÉMAM) and the École nationale d'aérotechnique (ÉNA). There is also a Master's program in aerospace engineering (M.Eng.) offered jointly by five of Québec's universities, three of which are located in Montreal (McGill, Université de Montreal and Concordia).

4.2.1.2 The life sciences industry[39]

In 2003 there were approximately 30,000 people employed in the life sciences industry in Montreal. This includes approximately 17,600 jobs at biopharmaceutical

[39] Unless otherwise indicated, all findings pertaining to the life sciences industry are taken from Montréal International (2003a), *Life Science: The Metro Montréal Cluster: Strategic Profile of a Success Story.*

companies, 3,700 at medical equipment suppliers, and 8,200 in public and parapublic research organizations. The industry can be divided into five areas: medical equipment, pharmaceuticals, biotechnology, biotech-pharma and contract research. The distribution of companies and jobs across these areas is as indicated by Table 3 and Table Four. Approximately 50% of the above-mentioned private sector jobs (not including contract research firms and sales offices) are for foreign-owned subsidiaries such as Merck Frosst Canada, Wyeth Canada, Abbott Laboratories, Aventis Pharma, Pfizer Canada, Bristol-Myers Squibb, Schering Canada, Novartis Pharma, Ratiopharm, and Tyco Medical Canada.

Table 4.2 – Life Sciences Industry Breakdown

(Data source: Montréal International 2003a. All percentages are rounded.)

Sector	Companies	Jobs
Public/Parapublic Research		8,200 (28%)
Private		21,315 (72%)
→ Biopharmaceuticals	158	17,616
→ Medical Equipment	116	3,699
TOTAL		29,515

Table 4.3 - Biopharmaceutical Sector Breakdown

(Data source: Montréal International 2003a.)

Biopharmaceuticals	Companies	Jobs
Pharmaceuticals	21	6,532
Biotechnology	92	4,531
Biotech-pharma	31	3,220
Contract Research	14	3,333
TOTAL	158	17,616

In a knowledge city it is essential that the city's industries be made up of a dense network of ties between its various sectors often called a 'cluster'. It is suggested that

Montreal is developing a viable 'life sciences cluster'. This is because it is possible for a company to follow the development of a drug from initial research all the way to final marketing, including preclinical and clinical trials, without leaving the city (Montréal International, 2003a). Companies located in Montreal have access to each other's skills, specialisations and services.

There are strong established relations between Montreal universities and world-class innovative companies such as Merck Frosst, Aventis Pharma, Bristol-Myers Squibb, Novartis Pharma, Boehringer Ingelheim, AstraZeneca, Pfizer, Glaxo SmithKline, and Eli Lilly. Many of these companies collaborate directly with Montreal universities on an ongoing basis. For example, Dr. Michel L. Tremblay of the McGill Cancer Centre has had an ongoing partnership with Merrick Frosst Canada (MCC, no date). Similarly, the NRC Biotechnology Research Institute counts Université de Montreal and McGill University among its major partners, and together they work closely with industry members such as the Montreal-based company Laborium Biopharma Inc. (NRC, 2005). Their collaboration has lead to investment in the sector's infrastructure and resources through the construction of additional facilities attached to the institute (NRC, 2005). Construction of more facilities is planned for the future (NRC, 2005).

Montreal is also home to a number of important centres for life science innovation and research, among them: the Québec Biotechnology Innovation Centre (QBIC) which is a biotechnology business incubator that fosters innovation and development in biotechnology; the Centre Québecois pour la valorisation des biotechnologies (CQVB) which is a centre dedicated to stimulating innovation and the transfer of technology in small to medium-size

biotechnology businesses; the Association of Health Technologies Industry (AITS) an organisation whose purpose is to support the growth of health technology by promoting its social and economic value; the Montreal Centre for Experimental Therapeutics in Cancer (MCETC) an organization whose mission is developing innovative treatments for cancer; and the McGill Cancer Centre that undertakes and coordinates independent cancer research at McGill University and its affiliated hospitals.

Further, in 2002, a Life Sciences Committee was formed with the aim to develop a strategic vision to guide Montreal's future and to realise its goal of becoming a world leader in life sciences. The committee identified a need to attract foreign and local investment, so they chose to adopt a place-marketing strategy that involved branding the cluster. In 2005 they gave the Montreal life sciences cluster an official logo and the brand name 'Montréal In-Vivo' (Leblanc, 2005).

4.2.1.3 The ICT industry[40]

In 2003 there were more than 95,000 people employed by 2,200 companies involved in manufacturing and developing ICTs, and providing ICT and telecommunications service in Montreal. The distribution of companies and jobs across these sectors is as indicated by Table 5. The major manufacturing employers in Montreal are CAE, Nortel Networks, Matrox, Sanima-SCI, and Viasystems Canada. The leading employers in development are Ericsson Canada, Ubisoft and Nsb Informatique. The major employers in the service sector

[40] Unless otherwise indicated, all findings pertaining to the ICT industry are taken from Montréal International (2003c), *Metropolitan Montréal's Information and Communications Technology Industry.*

are Bell Canada, the CGI Group, IBM Canada, Vidéotron, Microcell Telecommunications and Rogers Wireless Communications.

Table 4.4 – ICT Industry Breakdown

(Data source: Montréal International, 2003c – sourced to E&B Data. All percentages are rounded.)

Sector	Companies	Jobs
Manufacturing	240 (11%)	21,500 (23%)
Development	950 (44%)	26,000 (27%)
Services	800 (36%)	45,500 (48%)
Other	210 (9%)	2,000 (2%)
TOTAL	2,200	95,000

Montreal is home to the International Institute of Telecommunications (IIT) for advanced telecom services, the Centre national d'animation et de design (Centre NAD) for 3D animation and digital imaging, the Institut de création artistique et de recherché en infographie (ICARI) at Cegep Bois-de-Boulogne for artistic creation and Vanier College's CAD/CAM Centre for computer-assisted design and manufacturing.

4.2.2 Montreal's Knowledge Production

A broad range of public and private research facilities and centres that promote innovation, are located in Montreal and the surrounding region. According to the Institut de la statistique Québec41, there are 1288 companies in the Montreal region engaged in research and development activities. Of these companies, 59 engage in research in transportation (which includes aerospace research), 97 engage in research in biotechnology, 85 in Life Sciences (not including biotechnology), 441 in ICT, and 19 in information and cultural industries.

[41] www.stat.gouv.qc.ca

In particular, the aerospace industry in Montreal has long been characterised by its leadership and innovation. In 2000 Montreal was home to 63% of Canada's aerospace research activities (up from 47% in 1998). Bombardier Aerospace certified one new aircraft every year from 1992 to 2003, and Pratt & Whitney Canada has certified over 40 new engines in that time. In January 2003 the Consortium for Research and Innovation in Aerospace in Québec (CRIAQ) (organized by the École Polytechnique, the École de technologie supérieure, Concordia University, Université Laval, McGill University, Université du Québec à Chicoutimi, and Université de Sherbrooke), expressed the intention to carry out intensive research in aerospace and to increase the number of doctorates awarded in aerospace-related fields. By fostering graduate level research, they support innovation in the entire field, effectively enhancing & growing their pool of knowledge capital and planting the seeds of its future success.

In terms of ICT research and development, there are approximately 3,700 academic researchers working in 90 ICT-related centres across Montreal. These centres include: INRS-Énergie Matériaux et Télécommunications (INRS-EMT) whose purpose is to foster scientific innovation by developing research programs and supporting education at the graduate level in such areas as advanced materials, nanoscience and nanotechnologies, photonics, telecommunications and energy; the Centre de recherche sur les transports (CRT) which is a university research centre located at the Université de Montreal that specialises in the various analyses relevant for planning, managing and operating urban, interurban and international passenger and freight transportation systems; the McGill Centre for Intelligent Machines (CIM) which is a research group that bridges across departments and faculties to

facilitate and promote research on intelligent systems; the Regroupement Stratégique en Microélectronique du Québec (ReSMiQ) which is an inter-university research centre whose aim is to foster collaboration between universities and industry in the areas of advanced research in computer and system architectures, circuit design, testing and applications in telecommunication and biomedical devices, among others; the McGill Centre for Bioinformatics (MCB) which is made up of professors, postdoctoral fellows, and students, who share a common interest in bioinformatics as well as research and education in that field; the Laboratoire de communications et d'intégration de la microélectronique (LACIME) whose objective is to support research, collaboration between universities and industry and to foster the growth of a specialised labour force in microelectronics; and Hexagram, Institut de recherche/creation en arts et technologies médiatiques, a media arts and technology institute that supports interdisciplinary activities and research by bringing together artists, engineers, scientists and students with people from the cultural sector and industry.

Montreal is also home to a variety of other centres for research and innovation. Among them are: the Centre d'entreprises et d'innovation de Montreal (CEIM) whose objective is to offer customised management support for newly developing companies in information technology, multimedia, manufacturing technologies and life sciences; the Centre for Research in Human Development (CRDH) is dedicated to excellence in multi-disciplinary research and the training of specialised personnel in the field of human development; Villes Régions Monde (VRM) is an inter-university network dedicated to research in urban and regional studies; the Daniel Langlois Foundation for Art, Science and Technology that aims to further artistic and scientific knowledge by bringing art and science closer together within the context of technology; and Ex-Centris which calls itself an "avant-

garde facility" and is committed to nurturing independent filmmakers and producers as they experiment with new digital technologies and is designed to evolve with those technologies.

The Canada Research Council invests significantly in research done by Montreal researchers and research institutions. There are 291 Research Chairs held by researchers at Montreal universities42. Of these Research Chairs, 61 have been awarded by the Social Science and Humanities Research Council (SSHRC), 103 by the Natural Sciences and Engineering Research Council (NSERC), and 127 by the Canadian Institute of Health Research (CIHR) in Montreal.

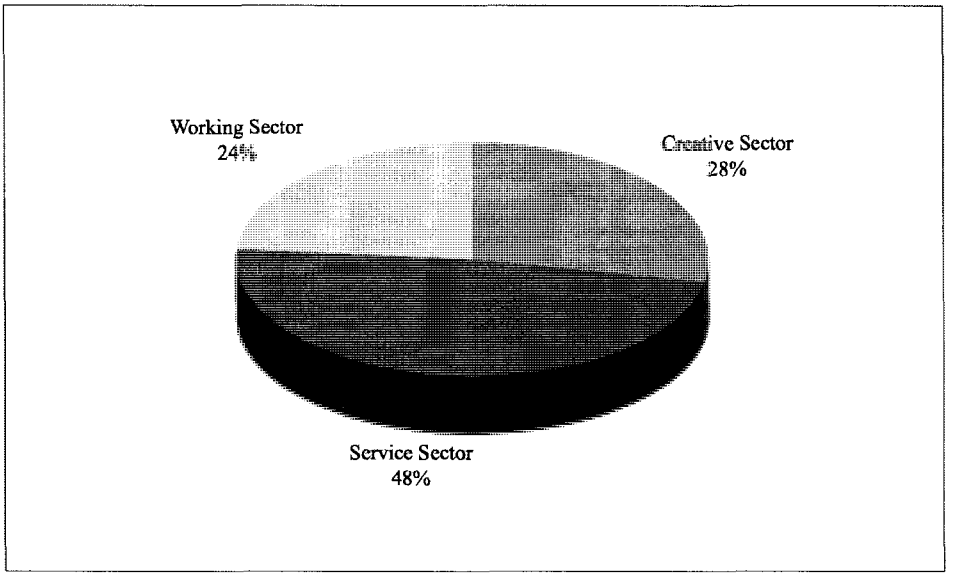
4.2.3 Montreal's Pool of Talented Human Capital

Montreal is ranked 4th in North America for jobs in High-Tech sectors per capita (Stolarick et al, 2005). There were 39,800 jobs in aerospace in 2001, and 37,800 in 2003. In 2003 there were approximately 30,000 jobs in life sciences and 95,000 in ICT-related fields. See Figure 4.1.

[42] Concordia University, Université Laval, McGill University, Université de Montreal, HEC, École Polytechnique, Université de Quebéc à Montreal.

Figure 4.1 - Workforce Breakdown

(Data source: Stolarick et al, 2005)



There are four major universities located in the Montreal region: Concordia University, McGill University, Université de Montreal (with the affiliated École Polytechnique and the École des Hautes Études Commerciales), and Université du Québec à Montreal. Montreal has the second largest number of students per capita in North America (second to Boston) (Stolarick et al, 2005), and the student population in the city has increased since five years ago. That increase, however, has slowed in recent years. See Table 4.5.

Table 4.5 - Montreal Student Population 2002-2006

(Data source: Québec Ministry of Education – based on enrolment at Concordia University, the École Polytechnique, the École des Hautes Études Commerciales, Mcgill University, Université de Montreal, and Université du Québec à Montréal. The percentage of students compared to the total population of Montreal was calculated using Census figures for the Montreal CMA in 2001 and 2006, and assumes constant population growth over that period.)

Students	2002	2003	2004	2005	2006
Bachelors Students	86,807	89,830	91,128	92,326	92,861
Masters Students	13,992	14,367	14,467	14,117	13,901
PhD Students	6,409	7,081	7,606	8,108	8,395
TOTAL Students	107,208	111,278	113,201	114,551	115,157
% of the Population	3.07%	3.16%	3.18%	3.18%	3.17%

The number of students enrolled in programs related to high tech increased from 23,043 in 2000 to 27,011 in 2004. See Table 4.6.

Table 4.6 – Students in High-tech Sectors

(Data source: Montréal International, 2006a.)

Number of students enrolled in programs related to high-tech sectors	2000	2001	2002	2003	2004
Bachelors Students	17,878	18,763	19,551	19,937	19,622
Masters Students	3,594	4,195	5,019	5,231	5,017
PhD Students	1,571	1,625	1,881	2,168	2,372
TOTAL Students	23,043	24,583	26,451	27,336	27,011

There was also an increase in the number of degrees awarded in programs related to high-tech sectors from 2000 to 2004. See Table 4.7.

Table 4.7 - University Degrees Awarded in High-tech

(Data source: Montréal International, 2006a.)

University degrees awarded in programs related to high-tech sectors	2000	2001	2002	2003	2004
Bachelors	3,480	3,587	3,731	3,842	4,053
Masters	1,171	1,076	1,457	1,675	1,773
PhD	267	241	214	246	292
TOTAL Degrees	4,918	4,904	5,402	5,763	6,118

4.3 Discussion

4.3.1 Montreal as a Creative City: Assets

One of the concluding suggestions of Montréal, Knowledge City is that the city ought to work to foster and support its existing media/entertainment, aerospace and life sciences industries. As can be seen from the findings reported in the preceding sections of this chapter, Montreal has strong aerospace, life sciences and ICT sectors. Each of these sectors is characterised by a solid dedication to research and innovation and is supported by a dynamic and nurturing milieu. This can be seen by the many centres for research and innovation located in Montreal, by organizations like Montreal In-Vivo, and by programs such as the joint M.Eng. in aerospace offered by five Québec universities, three of them located in Montreal.

It is through such centres, organizations, programs and strategic partnerships that the industries support and participate in the continuous knowledge production that characterises a creative city. Further, as is exemplified in the case of those major pharmaceutical companies which collaborate on research with Montreal universities, there is an important

exchange and sharing of knowledge that goes back and forth between the public and private sectors. This exchange is necessary to foster the dynamic environment that sustains knowledge production and supports the transformation of raw knowledge capital into usable innovations.

Also bound to this process is the pool of talented individuals who participate in the production of knowledge. In addition, the many researchers who live in Montreal, and the city's large student population, particularly of graduate level students, are important contributors to this pooling of talent, knowledge, and innovation. While students in general are important, graduate students who are more directly engaged in research and innovation, contribute to a larger degree. They are key to ensuring that a city continues to be an intellectually interesting and challenging place.

As a counterpoint to this formal intellectual environment, there is also a vibrant arts and culture scene in Montreal. According to the talent model, the many festivals, arts institutions and cultural events that happen in Montreal play an important role in stimulating creativity and knowledge production. According to the talent model a city stands to gain immensely by providing the opportunity for interaction between disciplines (particularly between the arts and sciences). The suggestion is that through this cross-fertilization there is an increased potential for innovation. In Montreal, organizations like the Society for Arts and Technology and the Daniel Langlois Foundation which actively seek to bridge the gap by integrating science and arts through technology are crucial to bringing about this cross-fertilization.

4.3.2 So is Montreal a Creative City? Is it a Knowledge City?

So is Montreal a creative city? Based on the three indicators of analysis proposed in this research, we can assert that it is. It has strong and established knowledge-based industries, there is evidence of both intense and continuous knowledge production, and is home to a sizeable pool of human capital.

But can we take a step further and say that Montreal is a successful creative city? Based on this research, it is clearly possible to present Montreal in a light that suggests it is either en route to becoming a successful creative city, or has already become one. It remains difficult, however, to pin down specific benchmarks by which to measure this so-called 'success'. As Duxbury (2004) states, establishing such benchmarks is one of the biggest challenges for cities working to put a creative city policy in place. Appropriate benchmarks generally vary from city to city based on the residents', urban elites', and corporate interests. These benchmarks must be put in place at the time of creating the initial policy, or else the policy itself is handicapped by the difficulty of measuring its effectiveness. While Montréal, Knowledge City names four performance indicators of a successful knowledge city (economic performance, quality of the innovation process, availability and skill level of human capital, and richness of cultural and social assets) it does not describe them in sufficient detail that they become measurable. As long as the indicators of success remain loose concepts, open to interpretation, it is impossible to determine whether a city has or has not been successful in attaining the goals laid out in its strategy. Measures of success are reliant on benchmarks, and given the absence of such benchmarks in Montréal, Knowledge City, it is impossible to measure the city's success in achieving its stated goals.

While it is evident that Montreal meets the requirements to be described as a creative city, it remains difficult to measure the extent to which it succeeds over time, due to the lack of benchmarks necessary to inform a longitudinal assessment. While it was not the aim of this study to compare Montreal to other cities implementing similar strategies, this would be one way to establish Montreal's level of success.

4.3.3 The Influence of Municipal Policy Visioning Initiatives in Montreal

Having established that Montreal can be designated as a creative city, we can return to an assessment of the overarching urban paradigm of the cybercity described in Chapter Two, in order to answer the primary research question: how do municipal policy visioning initiatives influence a city's transformation into a cybercity?

In the literature review, the creative city is identified as one of many sub-categories of the cybercity. That said, if Montreal is considered to be a creative city, it is also a cybercity. It is clear that the priorities outlined in the policy visioning initiative Montréal, Knowledge City have been important in all aspects of the city's development as a creative city over the past few years. Numerous reports detailing Montreal's industries, their development and the city's attractiveness to investors and incoming knowledge workers have since been published. Taken together, this collection of reports represents a solid support for the development of Montreal as a creative city.

The extent of the influence of Montreal's policy visioning initiatives on the city's development as a cybercity is less obvious. The creative city strategy employed by Montreal has served to bolster the aspects of the cybercity that are most strongly expressed by creative cities, however evidence of the influence of this policy visioning initiative goes no further. This means that Montréal, Knowledge City supports Montreal's development as a cybercity only insofar as that development coincides with its development as a creative city. Thus, in the case of Montreal, it can be established that the policy visioning initiative with the most potential to affect the city's transformation is limited by and large to an initiative that supports it unintentionally and only in part. This leads me to assert that while there are clear efforts being made to foster the development of creative cities, these efforts do not extend far enough to actively foster the creation and development of cybercities.

This can be explained by delving deeper into a question touched on earlier in this section and in the literature review. The notion of the cybercity is based largely on observed phenomena and is an attempt to explain these phenomena by mapping their occurrence within the urban context. The notion of creative city, while originally based in similar kinds of observations, has moved beyond being a way of explaining an accumulation of phenomena. It has become a model that policy-makers impose on a place in order to recreate the series of desired phenomena associated with it. In this case a thriving knowledge-based economy is seen as the ultimate goal, and the creative city strategy as the means of achieving it. By imposing the creative city model on a city, policy-makers hope to achieve the thriving knowledge-based economy that was part of the creative cities observed in the first place. Here we must ask, is there a correlation between these things or a causation? A causation cannot be proven, which begs the question of whether the correlation is solid enough ground

on which to base this kind of policy visioning initiative. Further, it has yet to be proven that the creative and diverse atmosphere that is viewed as ideal for attracting and retaining knowledge workers can be artificially produced or if, its authenticity will be forever compromised by having been the product of a policy initiative. Is this simply a well-calculated risk that policy-makers have deemed worthwhile, given the potential gains? Or, as (Peck, 2005) asserts, do these strategies have so little effect either positive or negative that there is really very little to be lost or gained through their implementation, and we ought not to be concerned.

4.4 Conclusion

The notion of the cybercity is still an emergent phenomenon. I posit that it arises from an accumulation of numerous minute changes in our societies, our technologies, our economies and our daily practices. The creative city concept, on the other hand, although it was once seen as a similar organic bottom-up transformation, is now being viewed as a model to inform top-down policy. Creative city strategies are the top-down incarnation of what was once a bottom-up transformation. Once it was identified that there were potential desirable outcomes from a city's development as a creative city, the observed phenomena were assembled to form the talent model. In the case of Montreal, the city is a creative city. Montreal has applied the talent model. Montreal's policies do not actively foster its emergence as a cybercity.

5.0 Conclusion

As our technologies, our economies and our societies evolve, so too do the places we live and the ways we live in them. In this research, cities, understood as the physical expression of the people who live in them, serve as a platform from which to assess contemporary currents of socioeconomic transformation. These trends give rise to a new kind of city, the cybercity. As we observe the emergence of the cybercity we begin to explore it, map it and eventually develop an understanding of it. This thesis, by examining how municipal policy visioning initiative influences a city's transformation into a cybercity, explores and maps a small portion of the emergent phenomenon. What follows is an outline of the major findings of this research organized according to the research question and sub-questions (restated below) posed at the outset. This summary permits the findings to be placed within a larger context, the limitations of this research to be identified, and some possibilities for future research to be suggested.

5.1 Major Findings

What follows are the answers to each of the four research sub-questions which build on each other to permit the central research question to be addressed. The first two sub-questions were answered through the review of academic literature and the answers to them are considered findings only so far as they contribute to answering the central research question. The latter two sub-questions were answered through the document analysis and archival work conducted in the case study.

• What is the major undercurrent of transformation occurring in contemporary cities?

This initial question is answered based on a survey of academic literature. This survey enabled the creation of a grid of cybercity characteristics (see Appendix C). Through an analysis of the grid the major characteristics of the cybercity were identified. The cybercity is a broad concept that aims to explain the transformations occurring in cities as they move into the information age. The main characteristics of the cybercity are:

• the intertwining of physical space, urban social practices and ICTs;

• an urban society that is increasingly reliant on technologically mediated forms of interaction to supplement face-to-face interaction;

• an economy characterized by creativity and knowledge production;

• a symbiotic relationship between urban form, experience of place and the development and use of ICTs.

• What model identified in the academic literature plays a key role in current policy visioning initiatives?

This question is answered by bridging between the academic literature and the policy documents examined. A model was sought to provide the ground for examining the cybercity concept. The talent model, derived from Florida's (2002) work as described by Donald and Morrow (2003), was selected. This model contributes in a major way to current urban economic development literature (Donald & Morrow, 2003). Fundamental to the talent model is the assertion that the pooling of creative people in cities is necessary to thriving knowledge-based economies. A review of reports published by Canadian Policy

Research Network (CPRN) and Strategic Research Analysis (SRA) showed how widespread an influence this model has had on Canadian urban policy. These reports reveal that the talent model is being applied in varying degrees in most of Canada's major cities (including Halifax, Montreal, Ottawa, Saskatoon, St. John's, Toronto, and Vancouver).

• How is this model used in Montreal's policy visioning initiative Montréal, Knowledge City: Report of the Montréal, Knowledge City Advisory Committee?

Based on an analysis of the primary assertions made in the report Montréal, Knowledge City, it is evident that Florida's (2002) work on the creative class plays a central role in the report. His work, particularly the talent model as described by Donald and Morrow (2003), is used throughout the report to justify and support the assertion that the biggest obstacle Montreal currently faces is the small size of its pool of knowledge workers. The talent model is also used to explain how this obstacle can be overcome: by fostering attractive amenities (natural environment, arts, local culture, recreational activities), a thick labour market, and cultural diversity, considered to be attractive to knowledge workers.

• To date, has this policy visioning initiative been successful in achieving its stated goals?

My assessment of the Montreal experience leads to a crucial distinction: while there is evidence that Montreal is a creative (or knowledge) city, it is not possible to measure whether it is successful as such. Due to the lack of clear benchmarks to allow for monitoring and fine tuning of the policy as it is implemented, it is impossible to assess whether the city

is a successful creative city, or is on the way to becoming a successful creative city. This is a major flaw in the policy, and should be considered as a major pitfall to be avoided in future policy development.

• How do municipal policy visioning initiatives influence a city's transformation into a cybercity?

The responses to the four research sub-questions outlined above, permit the central research questions to be answered. In the case of Montreal, Montréal, Knowledge City supports the development of the city as a cybercity only in so far as that development coincides with its development as a creative city. In the current academic and political climate, conditions known to exist in cities characterized as creative cities are considered to be desirable. As a result of this, policy initiatives seek to replicate these conditions. Since cybercities have not been specifically identified as economically successful or as particularly desirable places to live, there is no impetus to foster their development. Nonetheless, their development continues, slowly and organically. The socioeconomic currents that first brought them into being, continue to act on them, and they continue to develop.

5.2 Contributions & Implications

The critical analysis of the policy visioning initiative Montréal, Knowledge City, has the potential to make a valuable contribution to urban policy planning. By identifying the strengths and weaknesses of the document, this thesis informs current policy discussion and contributes to future policy development. Further, the mapping of changes occurring in

contemporary cities as they move away from the industrial model, benefits the visioning processes that cities regularly initiate to develop strategies for future growth. Although this exploratory study does not map a direct route for cities to take, it begins to plot the major landmarks through which we must navigate.

Further, the mapping of the cybercity, executed to answer the first research sub-question, contributes to the limited body of research on cybercities. It illuminates some of the changes occurring in contemporary cities and proposes that they be understood as the emergence of a new urban paradigm. This has the potential to inform both current policy discussions and further academic research.

5.3 Limitations & Possibilities for Future Research

Given the absence of clear benchmarks in Montréal, Knowledge City, a future comparative analysis of Montreal and other cities could provide a more thorough means to gauge the city's success as a creative city, and, through this, the success of the policy visioning initiative. A comparative study of this nature would broaden the application of the findings, and potentially greatly benefit future urban policy development.

Further, as was determined in this research, a policy visioning initiative such as Montréal, Knowledge City only effects the development of a city as a cybercity where that development coincides with the development of the city as a creative city. To determine how other aspects of cybercity development are influenced by urban policy it is necessary to examine other kinds of policy. An analysis of telecommunications policy, urban land use

policy or community planning policy could provide a highly relevant counterpoint to this study.

5.4 Concluding Thoughts

To recap, this thesis examines the transformation of industrial cities into cybercities, and the influence of municipal policy visioning initiatives on this transformation. The analysis of Montreal and the policy report Montréal, Knowledge City permit a deeper understanding of how this phenomenon is expressed in contemporary urban planning and policy development.

The research presented here is exploratory. Through it, a platform is established from which the transformation of industrial cities to cybercities can be examined in greater detail in the future. Further, the analysis of Montréal, Knowledge City led to one specific recommendation for future urban policy development. The clearest deficiency in Montréal, Knowledge City, is the absence of benchmarks that can be used to measure the success of the policy visioning document. Such benchmarks are essential to effectively fostering a city's development. Without them it is impossible to determine which parts of the policy have or have not been effective, and where to focus future efforts.

Cities are changing in response to the pressures and changes occurring in our societies, our economies and our technologies. Cybercities are emerging in response to these pressures and we have the opportunity to help these changes along, investing in the future of

the majority of the Earth's population. Effective policy is essential to support this process, and analyses such as this thesis are necessary to its realisation.

References

Andrew, C., Graham, K. A. & Phililips, S. D. (2000). Introduction: Urban affairs in Canada: Changing roles and changing perspectives. In Andrew, C., Graham, K. A. & Phililips, S. D (Eds.), Urban affairs: Back on the policy agenda. Montreal & Kingston: McGill-Queens University Press.

Ascher, F. (2000). Ces événements nous dépassent, feignons d'en être les organisateurs: Essai sur la société contemporaine. Gémenos, France: Éditions de l'Aube.

Beaverstock, J. V., Smith, R. G. & Taylor, P. J. (1999). A roster of world cities. Cities. 16(6), 445-458.

Blumenfeld, H. (1964). The urban pattern. The Annals of the American Academy of Political and Social Science. (352), 74-83.

Boden, D. & Molotoch, H. (2004). Cyberspace meets the compulsion of proximity. In S. Graham (Ed.), The cybercities reader (pp. 101-105). New York: Routledge.

Boyer, M. C. (1996). Cybercities: Visual perception in the age of electronic communication. New York: Princeton Architectural Press.

Bradford, N. (2004). Creative cities structured policy dialogue backgrounder. Ottawa, Ontario: Canadian Policy Research Networks. Retrieved June 1, 2007, from University of Ottawa Library.

Bradford, N. (2007). Whither the federal urban agenda?. Ottawa, Ontario: Canadian Policy Research Networks. Retrieved September 21, 2007, from University of Ottawa Library.

Brender, N., Cappe, M. & Golden, A. (2007). Mission possible: Successful Canadian cities: The Canada project final report, volume III. Ottawa, Ontario: Conference Board of Canada. Retrieved February 4, 2008, from http://www.conferenceboard.ca/documents.asp?rnext=1904.

Brault, S. & Quintas, E. (2002). Report on the Montreal summit. Retrieved May 2, 2007 from http://www.culturemontreal.ca/positions/020610_reportsummit.htm.

Bunnell, T. (2004). Cyberjaya and Putrajaya: Malaysia's "intelligent" cities. In S. Graham (Ed.), The cybercities reader (pp. 348-353). New York: Routledge.

Cairncross, F. (1997). The death of distance: How the communications revolution will change our lives. London: Orion.

Castells, M. (1999). Grassrooting the space of flows. Urban Geography. 20(4), 294-302.

Castells, M. (2000). The rise of the network society 2nd Ed. Malden, MA: Blackwell Publishers Inc.

Castells, M. (2004). Space of flows, space of places: Materials for a theory of urbanism in the information age. In Stephen Graham (Ed.), The cybercities reader (pp.82-93). New York: Routledge.

Chatterton, P. (2000). Will the real creative city please stand up?. City. (4)3, 390-397.

Childe, V. G. (1950). The urban revolution. Town Planning Review. (21)1, 3-17.

City of Ottawa. (2003). Ottawa 2020: Arts and heritage plan. Ottawa: City of Ottawa. Retrieved March 2, 2008 from http://www.ottawa.ca/city_services/planningzoning/2020/arts/toc_en.shtml.

City of Toronto. (2003). Culture plan for the creative city. Toronto: City of Toronto: Cultural Division. Retrieved February 2, 2007 from http://www.toronto.ca/culture/cultureplan.htm.

City of Toronto. (2007). Background on the city of Toronto act. Retrieved September 14, 2007 from http://www.toronto.ca/mayor_miller/summaryact.htm.

Creative City Task Force, The. (2007). Creative city: culture plan for Vancouver 2008 - 2018 (Draft). Vancouver: City of Vancouver: Cultural Services. Retrieved February 4,

2008 from http://www.city.vancouver.bc.ca/commsvcs/oca/citycreative/strategicplan.htm#conclude.

de Sola Pool, I. (2004). The structure of cities. In S. Graham (Ed.), The cybercities reader (pp. 47-49). New York: Routledge. [First published in 1976]

Donald, B & Morrow, D. (2003). Competing for talent: Implications for social and cultural policy in Canadian city-regions. Hull, Quebec: Strategic Research and Analysis (SRA). Retrieved September 16, 2007 from http://geog.queensu.ca/faculty/donald.asp.

Duxbury, N. (2004). Creative cities: Principles and practices. Ottawa, Ontario: Canadian Policy Research Networks. Retrieved August 8, 2007, from University of Ottawa Library.

Ergazkis, K., Metaxiotis K., Psarras, J. & Askounis, D. (2006). A unified methodological approach for the development of knowledge cities. Journal of Knowledge Management. (10)5, 66-78.

Flew, T. (2005). Sovereignty and software: Rethinking cultural policy in a global creative economy. International Journal of Cultural Policy. (11)3, 243-260.

Florida, R. (2002). The rise of the creative class: And how it's transforming work, leisure, community and everyday life. New York: Basic Books.

Florida, R. (2003). Cities and the creative class. City and Community. (2)1, 3-19.

Foray, D. (2000). L'économie de la connaissance. Paris: Éditions La Découverte.

Foray, D. (2004). The economics of knowledge. Cambridge, Massachusetts: MIT Press.

Foray, D. (2006). Optimizing the use of knowledge. In B. Kahn & D. Foray (Eds.) Advancing knowledge and the knowledge economy (pp. 9-15). Cambridge, Massachusetts: MIT Press.

Friedmann, J. (1986). The world city hypothesis. Development and Change. (17), 69-83.

Gaspar, J. & Glaeser, E. L. (1998). Information technology and the future of cities. Journal of Urban Economics. (43), 136-156.

Gertler, M. S. (2004). Creative cities: What are they for, how do they work, and how do we build them? Ottawa, Ontario: Canadian Policy Research Networks. Retrieved August 8, 2007, from University of Ottawa Library.

Gertler, M. S., Florida, R., Gates, G. & Vindorai, T. (2002). Competing on creativity: Placing Ontario's cities in North American context. Toronto, Ontario: Institute for

Competitiveness and Prosperity. Retrieved May 19, 2007 from http://www.urban.org/publications/410889.html.

Gillespie, A. & Richardson, R. (2000) Teleworking and the city: Myths of workplace transcendence and travel reduction. In J. O. Wheeler, Y. Aoyama & B. Warf (Eds.) Cities in the Telecommunications Age: The Fracturing of Geographies (pp. 228-248). London: Routledge.

Glaeser, E. L. (2004). Review of Richard Florida's 'The rise of the creative class'. Retrieved 6 October 2007 from www.creativeclass.org.

Gospodini, A. (2006). Portraying, classifying and understanding the emerging landscapes in the post-industrial city. Cities. (23)5, 311-320.

Graham, S. (1997). Imagining the real-time city: Telecommunications, urban paradigms and the future of cities. In S. Westwood & J. Williams (Eds.) Imagining Cities: Scripts, Signs, Memory (pp. 31-49). London: Routledge.

Graham, S. (1999). Global grids of glass: On global cities, telecommunications and planetary urban networks. Urban Studies. 36(5-6), 929-949.

Graham, S. (2004). Introduction. In The cybercities reader (pp.3-29). New York: Routledge.

Graham, S. & Marvin, S. (1999). Planning cyber-cities? Integrating telecommunications into urban planning. Town Planning Review. 70(1), 89-114.

Graham, S. & Marvin, S. (2001). Splintering urbanism: Networked infrastructures, technological mobilities and the urban condition. New York: Routlege.

Hall, E. T. (1966). The hidden dimension. Garden City, NY: Doubleday.

Hall, P. (1998). Cities in civilization. New York: Pantheon Books.

Hall, P. (2003). The end of the city: "The report of my death was an exaggeration". City. 7 (2), 142-52.

Hannigan, J. (2007). A neo-bohemian rhapsody: Cultural vibrancy and controlled edge as urban development tools in the "new creative economy". In T. A. Gibson & M. Lowes (Eds.) Urban communication: Production, text, context. Laham, MD: Rowman & Littlefield.

Harris, C. & Ullman, E. L. (1945). The urban revolution. Town Planning Review. 21(1), 3-17.

Harvey, D. (1989). From managerialism to entreprenrurialism: The transformation in urban governance in late capitalism. Geographiska Annaler. 71B(1), 3-17.

Hospers, G. (2003). Creative cities: Breeding places in the knowledge economy. Knowledge, Technology & Policy. 16(3), 143-162.

Jacobs, J. (1961). The death and life of great American cities. Toronto: Random House.

Jacobs, J. (1984). Cities and the wealth of nations. New York: Random House.

Jacobs, J. (1993). Forward. In The death and life of great American cities (1993 ed). New York: Modern Library.

Kuhn, T. (1962). The structure of scientific revolutions. Chicago: Chicago University Press.

Landry, C. & Bianchini, F. (1995). The creative city. London: Demos.

Lash, S. & Urry, J. (1994). Economies of objects and subjects: Mobile objects. In Economies of Signs and Spaces. London: Sage Publications.

Leblanc, M. (2005, March 30). Prendre la place qui nous revient: Une image de marque internationale pour la grappe des sciences de la vie du Montréal métropolitain. Presented at BioMedex 2005. Retrieved January 23, 2008 from http://www.montreal-invivo.com/sciencesdelavie/site/explorateur.jsp?currentlySelectedSection=277.

Malanga, S. (2004). The curse of the creative class. City Journal. Winter, 36-45.

McGill Cancer Centre (MCC). (No date). Research: Partnerships. Retrieved January 23, 2008 from http://cancercentre.mcgill.ca/research/index.php?option=com_content&task=view&id=14&Itemid=98.

Michaud, P. & Tcheremenska, A. (2003). Montréal, knowledge city: Report of the Montréal, knowledge city advisory committee. Retrieved February 2, 2007 from http://www.montrealinternational.com/en/pub/documents.aspx?docs=info.

Mitchell, W. J. (1995). City of bits: Space, place and the infobahn. Cambridge, Massachusetts: MIT Press.

Mitchell, W. J. (1999). E-topia: Urban life Jim,—But not as we know it. New York: Routledge.

Mitchell, W. J. (2004). The city of bits hypothesis. In S. Graham (Ed.), The cybercities reader (pp.123-8). New York: Routledge.

Montréal International (2003a) Life science: The metro Montréal cluster: Strategic profile of a success story Retrieved October 9, 2007 from http://www.montrealinternational.com.en/pub/documents.aspx?docs=info.

Montréal International. (2003b). The metro Montréal aerospace industry. Retrieved October 9, 2007 from http://www.montrealinternational.com.en/pub/documents.aspx?docs=info.

Montréal International. (2003c). Metropolitan Montréal's information and communications technology industry. Retrieved October 9, 2007 from http://www.montrealinternational.com.en/pub/documents.aspx?docs=info.

Mumford, L. (1961). The city in history: Its origins, its transformations, and its prospects. New York: Harcourt Brace Jovanovich Inc.

National Research Council Canada (NRC). (2005, May 18). Montréal life sciences. Retrieved January 23, 2008 from http://www.nrc-cnrc.gc.ca/clusters/montreal-ls_e.html.

Ó Riain, S., Parthasarathy, B. & Zook, M. A. (2004). Flows and filters: The politics of ICT regions and a global economy. International Journal of Urban and Regional Research. (28)3, 617-620.

Organisation for Economic Co-operation and Development (OECD). (2007). OECD territorial reviews: Competitive cities in the global economy. Paris: OECD Publishing. Retrieved February 4, 2008 from www.oecd.org/document/2/0,3343,en_2649_34413_37801602_1_1_1_1,00.html.

Panayides, A. & Kern, C. R. (2005). Information technology and the future of cities: An alternative analysis. Urban Studies. (42)1, 163 167.

Pascal, A. (1987). The vanishing city. Urban Studies. 24, 597-603.

Peck, J. (2005). Struggling with the creative class. International Journal of Urban and Regional Research. (29)4, 740-770.

Plaut, P. O. (2004). Do telecommunications make transportation obsolete? In S. Graham (Ed.), The cybercities reader (pp. 162-166). New York: Routledge.

Robinson, J. (2005). Urban geography: World cities, or a world of cities. Progress in Human Geography. (29)6, 757-765.

Rubenstien, J. M. (2000). Three models of urban structure. Retrieved October 28, 2007 from http://www.hawaii.edu/hga/urban00/ModelsCities.html.

Sassen, S. (1991). The global city: New York, London, Tokyo. Princeton: Princeton University Press.

Sassen, S. (2000). New frontiers facing urban sociology at the millennium. British Journal of Sociology. (51)1, 143-159.

Sassen, S. (2004). Agglomeration in the digital era?. In Stephen Graham (Ed.), The cybercities reader (pp.195-8). New York: Routledge.

Sassen, S. (2006). Introduction. In Territory, authority, rights: From medieval to global assemblages (pp.1-23). New York: Routledge.

Scott, A. J. (2006). Creative cities: Conceptual issues and policy questions. Journal of Urban Affairs. (28)1, 1-17.

Skinner, E. (1998). The Caribbean data processors. In Global productions: Labor in the making of the information society. Cresskill, N.J.: Hampton Press.

Statistics Canada. (2007). 2006 Census of population (provinces, census divisions, municipalities): Portrait of the Canadian population in 2006: Highlights. Ottawa, Ontario: Statistics Canada. Retrieved January 31, 2008 from http://www12.statcan.ca/english/census06/analysis/popdwell/highlights.cfm.

Stolarick, K. & Florida, R. (2006). Creativity, connections and innovation: A study of linkages in the Montreal region. Environment and Planning. 38, 1799-1817.

Stolarick, K., Florida, R. & Musante, L. (2005). Montréal's capacity for creative connectivity: Outlook & opportunities. Catalytix Working Paper. Retrieved June 17, 2007 from http://www.cultureMontréal.ca/dossiers/issues.htm.

United Nations: Department of Economic and Social Affairs (UN: DESA). (2008). World urbanization prospects: The 2007 revision: Highlights. New York: United Nations. Retrieved March 13, 2008 from http://www.un.org/esa/population/unpop.htm.

Waitt, G. (1999). Playing games with Sydney: Marketing Sydney for the 2000 olympics. Urban Studies. (36)7, 1055-1077.

Walton, J. (1992). Making the theoretical case. In *What is a Case? Exploring the Foundations of Social Inquiry.* C. Ragin & H. S. Becker (Eds.) pp. 121-138. New York: Wiley.

Webber, M. (1968). The post-city age. Daedalus. 97, 1091-1110.

Weber, M. (1958). The nature of the city. In The city (pp.65-89). (D. Martindale & G. Neuwirth Eds. & Trans.). New York: The Free Press.

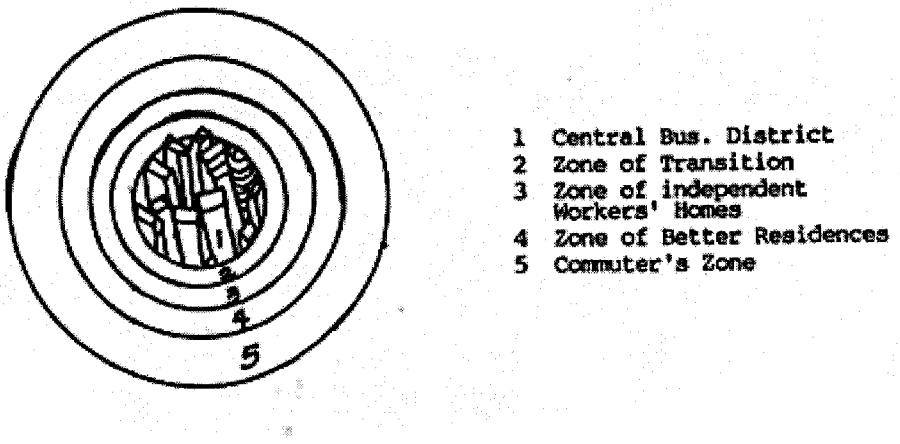
Webster, F. (1997). Is this the information age?. City. (2)8, 71-84.

Appendix A – City Structure

Traditionally there have been three generalized patterns used for describing the internal structure of cities: concentric zones, sectors and multiple nuclei. The following description of these patterns is based on Harris and Ullman's (1945) article on the support and internal structure of cities. For a more detailed description, please refer directly to the article.

In the concentric zone pattern there are five zones arranged around the central business district (CBD) which is the focus of the city's commercial, social and civic life. The second zone is an area of residential deterioration as business and light industry from the CBD slowly expand outward. The third zone is composed primarily of working class family dwellings. The fourth zone is a slightly wealthier area with mostly single-family dwellings and higher-class apartment buildings. The fifth and final zone is the commuter zone.

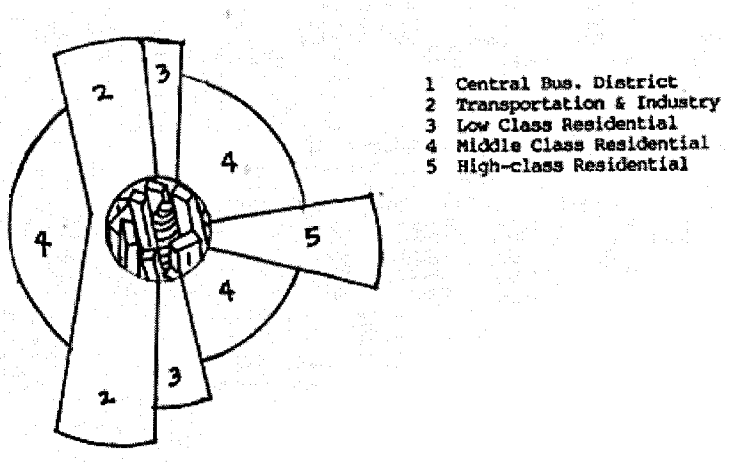
Figure A2 - Concentric Circle Pattern



(Source: Rubenstein, 2000)

The sector pattern follows a theory of axial development whereby development of the city occurs along its main transportation routes to form a roughly star-shaped city. In this pattern, the city is conceived of as a circle with similar types of land use clustered together, originating near the centre of the city (which remains the same as the CBD of the concentric zone pattern) and radiating outward to the periphery in wedge-shaped sectors.

Figure A3 - Sector Pattern

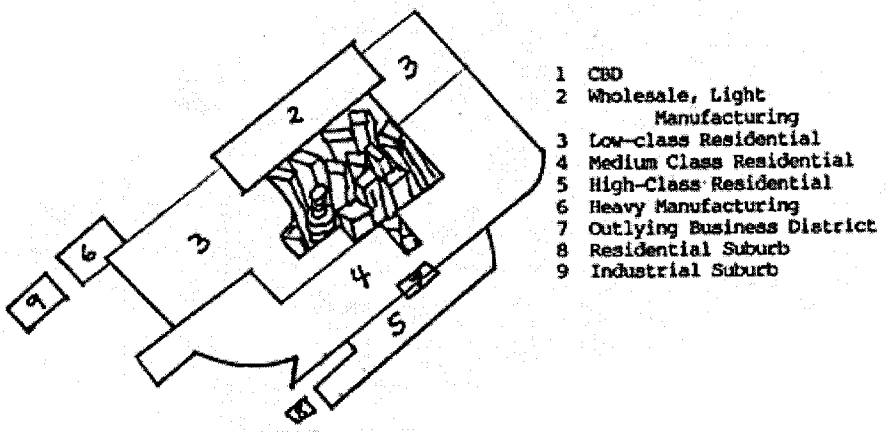


(Source: Rubenstein, 2000)

With the multiple nuclei pattern, the city is built around several distinct centres. Generally these separate centres for four reasons: first, certain activities necessitate specialized facilities; secondly, some activities group together because they benefit from proximity; thirdly, dissimilar activities are often detrimental to each other; and fourthly, simply the cost and availability of suitable sites for activities. The areas that are generally found in a multi-nuclear city are: CBD, light-manufacturing districts, heavy-industry

districts, residential districts, suburbs and a variety of other minor nuclei including cultural centres, business parks, universities and small industrial centres.

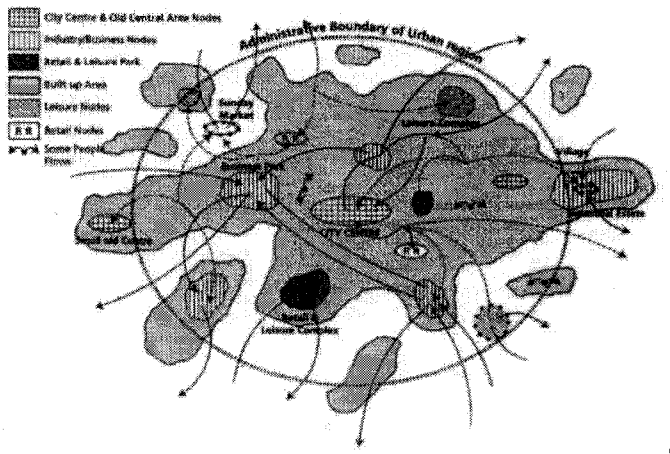
Figure A4 - Multiple Nuclei Pattern



(Source: Rubenstein, 2000)

This pattern should not be confused with the post-industrial polycentric city described by Ascher (2000), Hall (2003) and Gospodini (2006). While they possess superficial similarities, the uses of the various centres are distinctly different. Rather than the variety of industrial activities found in the multi nuclei pattern described above, the polycentric city has business, historical, cultural and entertainment areas.

Figure A5 - Polycentric Pattern



(Source: Graham & Marvin, 2001, p. 205)

Over the 20th century we also see that municipal zoning patterns have evolved significantly aiming at various points either to mix or separate land-uses (Gospodini, 2006). In the early part of the century land-use in Western cities was mostly mixed (Gospodini, 2006). In the 1950s there was a shift towards specific land-use zoning (Gospodini, 2006). In the 1980s there was a return to mixed land-use zoning in an attempt to reclaim underused public space through reconstruction and renewal (Gospodini, 2006). Since the 1990s there has been a trend towards "eclectic clustering" of urban activities. New economic activities like high-level finance, technology and other knowledge based firms, as well as culture and leisure activities cluster outside the central business district in parts of the city that are a product of renewal (Gospodini, 2006).

Appendix B – World Cities

This list of world city rankings is taken from Beaverstock, Taylor and Smith (1999, p. 456). The values used to determine the ranking are produced by 3 points for prime centre status, 2 for major centre status, and 1 for minor centre status in areas such as accountancy, advertising, banking and legal services. Alpha world cities are global service centres in all four of these areas; beta world cities are global service centres in three of these sectors; while gamma world cities are global service centres for only two sectors

Alpha World Cities
12: London, Paris, New York, Tokyo
10: Chicago, Frankfurt, Hong Kong, Los Angeles, Milan, Singapore

Beta World Cities
9: San Francisco, Sydney, Toronto, Zurich
8: Brussels, Madrid, Mexico City, Sao Paulo
7: Moscow, Seoul

Gamma Word Cities
6: Amsterdam, Boston, Caracas, Dallas, Düsseldorf, Houston, Jakarta, Johannesburg, Melbourne, Osaka, Prague, Santiago, Taipei, Washington
5: Bangkok, Beijing, Rome, Stockholm, Warsaw
4: Atlanta, Barcelona, Berlin, Buenos Aires, Budapest, Copenhagen, Hamburg, Istanbul, Manila, Miami, Minneapolis, Montreal, Munich, Shanghai

Relatively strong evidence of world city formation
3: Athens, Auckland, Dublin, Helsinki, Luxembourg, Lyon, Mumbai, New Delhi, Philadelphia, Rio de Janeiro, Tel Aviv, Vienna

Some evidence of world city formation

2: Abu Dhabi, Almaty, Birmingham, Bogotá, Bratislava, Brisbane, Bucharest, Cairo, Cleveland, Cologne, Detroit, Dubai, Ho Chi Minh City, Kiev, Lima, Lisbon, Manchester, Montevideo, Oslo, Rotterdam, Riyadh, Seattle, Stuttgart, The Hague, Vancouver.

Minimal evidence of world city formation

1: Adelaide, Antwerp, Arhus, Baltimore, Bangalore, Bologna, Brasilia, Calgary, Cape Town, Columbus, Dresden, Edinburgh, Genoa, Glasgow, Gothenburg, Guangzhou, Hanoi, Kansas City, Leeds, Lille, Marseille, Richmond, St Petersburg, Tashkent, Tehran, Tijuana, Turin, Utrecht, Wellington.

Appendix C – Grid of Cybercity Characteristics

Author	Text (year)	Conceptual Contribution	Characteristic	Example	Relevance	Strength/ Weakness
		(The main concept taken from the text.)	(In what way is this concept characteristic of the cybercity?)	(An example of this characteristic)	(In what way is this relevant to the concept cybercity?)	(What are its strengths/ weaknesses?)
François Ascher	Ces évenements nous dépassons (2000)	The interpenetration of public & private spheres.	There is often no clear distinction between public & private spheres.	Phoning family from work; home businesses.	Lifestyle of the cybercity residents.	Integral to the social shifts that have lead to the formation of the cybercity.
		Multifunctional space.	Space is used for a variety of things.	Coffee shops are used for socializing, meeting, studying, etc.	Use of space in the cybercity.	Integral to the shift in the use of space in the cybercity.
		The hypertext society.	The residents of the cybercity have multiple roles & function on a variety of levels depending on the situation.	People function on familial, professional or other levels.	Residents of the cybercity.	Integral to the social shifts that have lead to the formation of the cybercity.
Manuel Castells	The Network Society (1994?)	The network society.	The residents of the cybercity are connected to each other in	People connect through an increasing variety of	Residents of the cybercity.	Integral to the social shifts that have lead

			a network.	means: phone, email, MSN, MySpace, Facebook, etc.		to the formation of the cybercity.
	Space of Flows, Space of Places: Materials for a Theory of Urbanism in the Information Age (2004)	The space of flows (electronic linking of geographically separate places) & the space of places (locality).	The tension between the space of flows and the space of places leads to the transformation of the city into the cybercity. In the cybercity there are areas that are local (place-centred) and places that are global (flow-centred).	In New York, a global city, there are local, place-focussed areas like Greenwich Village and global, flow-focussed places like Wall Street. In Ottawa, the Glebe vs. Kanata.	The networks and flows (movement of people, goods, info) of the cybercity are becoming increasingly important compared to place and proximity.	Essential to an understanding of the intertwining of the tangible and intangible elements of the cybercity.
Le Corbusier	(1934)	Polycentric city (Nemours N. Africa).	-----	-----	Precursor to the cybercity.	-----
Dominique Foray	L'économie de la connaissance (2000)	The knowledge-based economy.	The primary economic activity in the cybercity is related to knowledge-based sectors.	Finance, high tech, biotech, education, media, & creative industries.	Economy of the cybercity.	Integral to the economic shifts that have lead to the formation of the cybercity.
Gaspar & Glaeser	Information Technology and the Future of Cities (1998)	The use of telecommunications increases face-to-face communication.	The widespread use of ICTs builds face-to-face community.	This was an empirical study so its results are an example.	Lifestyle of the cybercity residents.	Gives empirical results that support the social changes leading to

						the formation of the cybercity.
Gospo-dini	Portraying, classifying and understanding the emerging landscapes in the post-industrial city (2006)	Description of post-industrial cities.	The cybercity as a form of post-industrial city, and it has some of it the characteristics of the post-industrial city.	Multiple cores or epicentres.	Form of the cybercity	Assists in the clarification of the post-industrial city, and thus the cybercity.
		The polycentric urban form (with 4 main epicentres: entrepreneurial, high-culture, popular leisure, and culture and leisure waterfront).	The widespread use of ICTs permits the formation of separate activity cores.	Vancouver: downtown-business & retail, yaletown-tech & retail, broadway btw granville & cambie-medical, granville island-tourism, craft.	Form of the cybercity	The polycentric form is the key physical difference between the cybercity and its precursor.
		Initiatives to upgrade status in hierarchy of global cities.	This illustrates the self-sufficiency of the cybercity, & it's independence from the nation.	Montreal as a "knowledge city"; Toronto as a "creative city".	The importance of global status to the cybercity.	May give insight into the shifting position of cybercities in the global arena.
		Cultural activities are becoming increasingly important economic engines for	This illustrates the importance of cultural enterprise in the cybercity, both for	Vancouver, as a digital entertainment hub and 'livable' city, draws trained	The role of cultural activities in drawing the	Explains the agglomeration that results in the cybercity

		cities, partially because cultural amenities attract trained professionals to work in tech & finance sectors.	improving the quality of life of the residents and for attracting new workers.	professionals .	residents of the cybercity to the city.	(and not the dispersal of the city).
Stephen Graham	Global Grids of Glass: On Global Cities, Telecommu nications and Planetary Urban Networks (1999)	Cities form nodes of global societal, economic and cultural systems.	Similar to the networks between residents of the cybercity, cybercities are connected to each other in global networks.	Silicon Valley, Dublin & Bangalore form a high tech chain/ network.	Cyberciti es participat e in a global network of cities.	May give insight into the shifting position of cybercitie s in the global arena.
	Information Technologie s and Reconfigurat ions of Urban Space (2002)	New kinds of space because of ICT use.	The widespread use of ICTs creates a need for buildings to house computer and internet infrastructure.	"Digital districts" that fulfill the needs of Internet and digital media companies; "ultra secure e-commerce enclosures" (Mauritius).	Form of the cybercity.	This expands the physical changes that are occurring in the cybercity by describin g one addition to the landscape .
Edward T. Hall	The Hidden Dimension (1966)	"The city is . . . an expression of the culture of the people who produced it."	The cybercity is directly related to the culture of its residents.	The residents of the cybercity rely increasingly on technology and the polycentric urban form	Interactio n of the cybercity, its residents and technolog y.	This is a foundatio nal concept as it links the residents to the technolog y that is

				has emerged because it is no longer necessary for all business to be located in one area.		changing the urban form.
Peter Hall	The End of the City: "The Report of my Death Was an Exaggeration" (2003)	The polycentric urban form.	The widespread use of ICTs permits the formation of separate activity cores (a traditional business core (incl. historical centre), a secondary business core, a tertiary business core incl. entertainment), an outer "edge city", outermost "edge cities").	Vancouver: downtown-business & retail, yaletown-tech & retail, broadway btw granville & cambie-medical, granville island-tourism, craft.	Form of the cybercity.	The polycentric form is the key physical difference between the cybercity and its precursor.
		The hierarchy of cities based on the relationship of different places that are connected through systems for business travel and information exchange.	Cybercities are nodes in a global system that engages in the exchange of people & information. Some nodes are more central.	New York, Tokyo, London, Paris.	Cybercities participate in a global network of cities instead of the traditional vertical hierarchy.	May give insight into the shifting position of cybercities in the global arena.
		Global Cities are centres of finance & business,	The main economic activity of the cybercity is	New York, Tokyo, London & Paris meet		Describes the global city, an example

		command & control (of government & transnational corporations), creative & cultural industries, and tourism.	focused on the generation, transfer and consumption of info and knowledge.	all of Hall's criteria for global cities.		of major cybercities.
Keith Hampton	Netville: Community On and Offline in a Wired Suburbs (2000)	The use of broadband increase face-to-face interaction.	The widespread use of ICTs builds face-to-face community.	Netville.	Lifestyle of the residents of the cybercity.	Gives empirical results that support the social changes leading to the formation of the cybercity.
Jane Jacobs	The Birth & death of Great American Cities (1961)	Critique of urban planning. (Historical)	Urban redevelopment from 1900-1961 was not effective. How does the cybercity compare?	Low-income housing built in that period did not improve quality of life.	Criticism of the precursor to the cybercity.	This may explain some of the pressures that lead to the cybercity as it discusses the ways older cities were not working.
		Streets & sidewalks, as important public places in the city, are its "vital organs".	The sidewalks of the cybercity are a clear example of changing use of space.	Talking on the phone while walking: whose space? What kinds of activities are appropriate?	Use of space in the cybercity.	This may provide a historical basis for examining the use of public space in the cybercity

						for private activities.
William J. Mitchell	City of Bits (1995)	Comparison of synchronous & asynchronous communicatio n.	An increasingly varied selection of modes of communicatio n are available to the resident of the cybercity.	Face-to-face, phone, cell, mail, email, note, text msg, skype, VoIP, IM, etc.	Lifestyle of the cybercity residents.	Integral to the social shifts that have lead to the formation of the cybercity.
		Blurring of the home/work divide.	It is less and less necessary to be in an office to work.	Home-offices, telework.	Lifestyle of the cybercity residents.	Integral to the social shifts that have lead to the formation of the cybercity.
	E-topia (1999)	The economy of presence (ICTs permit value to be attached to presence vs. telepresence).	ICTs permit presence without proximity. Individuals must choose the most appropriate kind of interaction for any particular situation.	It is more expensive to organize a face-to-face meeting than a phone conference; email or cold call?	Lifestyle of the residents of the cybercity given that ICTs permit geographi c dispersal but do not force it.	Integral to the social shifts that have lead to the formation of the cybercity.
Lewis Mum-ford	"What is a city?" (originally 1937)	The organization of the city follows its social needs.	The cybercity is directly related to the culture of its residents.	The residents of the cybercity rely increasingly on technology and the polycentric urban form has emerged	Interactio n of the cybercity, its residents and technolog y.	This is a foundatio nal concept as it links the residents to the technolog y that is changing

				because it is no longer necessary for all business to be located in one area.		the urban form.
Pana-yides & Kern	Information Technology and the Future of Cities: An Alternative Analysis (2005)	The use of telecommunications increases face-to-face communication. (more complex than G&G)	The widespread use of ICTs builds face-to-face community.	This was an empirical study so its results are an example.	Lifestyle of the cybercity residents.	Gives empirical results that support the social changes leading to the formation of the cybercity.
Ó Riain, Seán, Balaji Partha-sarathy & Matthew A. Zook	Flows and Filters: The Politics of ICT Regions and a Global Economy (2004)	Silicon Valley, Dublin and Bangalore as hubs of a global tech network.	Similar to the networks between residents of the cybercity, cybercities are connected to each other in global networks.	Silicon Valley, Dublin and Bangalore are hubs of a global tech network.	Cyberciti es participat e in a global network of cities.	This gives a precise example of a global cybercity network.
Saskia Sassen	The Global City (1991)	The emergence of global cities because of rise of finance as primary economic activity.	ICTs are a significant part of the reason finance (a clear example of knowledge-based activity) has become such a major activity.	London, New York, & Tokyo.	The economy characteristic of the cybercity also leads to the emergence of global cities.	Describes the reasons behind the emergence of the global city, an example of large cybercities.
		The global city as a place that concentrates intellectual,	Similarly, the cybercity is a place that concentrates intellectual,	Vancouver is a hub for the digital media industry, and by being a	Residents of the cybercity.	Explains the agglomeration that results in

		creative and human resources.	creative and human resources.	hub it draws in more trained professionals .		the cybercity (and not the dispersal of the city).
	New Frontiers Facing Urban Sociology at the Millennium (2000a)	Globalization & communicatio n technologies are about dispersal.	The cybercity emerges from forces of concentration more powerful than the dispersing forces of ICTs and globalization.	While ICTs permit people to locate anywhere, young educated professionals choose cities.	ICTs & globalizat ion permit geographi c dispersal.	Explains the agglomer ation that results in the cybercity (and not the dispersal of the city).
		Disruption of old scalar hierarchy (globe-country-region-city), now cities are nodes in transnational networks (global cities cannot exist in isolation).	Cybercities are nodes in a variety of global networks.	Finance network: New York, London, Tokyo, Paris, Frankfurt, Zurich, Amsterdam, LA, Sydney, Hong Kong.	Cyberciti es participat e in a global network of cities instead of the traditiona l vertical hierarchy.	May give insight into the interactio n of cybercitie s in global networks.
	Excavating Power: In Search of New Frontier Zones and New Actors (2000b)	The transformation of the state leads to new political opportunities and new global actors (international civil order).	Large cities, including cybercities, are gaining power as national states lose it.	Sassen's description of global cities & Territory, Authority, Rights.	The cybercity, is a global player independ ent of its nation.	May give insight into the interactio n of cybercitie s in global networks.
		Cities are strategic sites to observe the outcomes of	The cybercity is a conception of the city that	The cybercity is a strategic site to examine	The cybercity is a lens to	This justifies the use of the city as

		the transformation of the state.	focuses on the changes occurring to society.	the effects technology on day-to-day life as it contains a high concentration of technology users.	examine social change.	a model for examining social change.

Appendix D – List of Websites

Association of Health Technologies Industry
www.aits.ca

Canadian Centre for Architecture
www.cca.qc.ca

Centre d'entreprises et d'innovation de Montréal
www.ceim.org

Centre de recherche sur les transports
www.crt.umontreal.ca

Centre for Excellence in Brownfields Rehabilitation
http://www.cemrs.qc.ca/

Centre for Excellence in Women's Health
http://www.cesaf.umontreal.ca/

Centre for Research in Human Development
crdh.concordia.ca

Centre of Excellence in Pharmacogenomics
No website available. For some information refer to: http://www.montreal-invivo.com/sciencesdelavie/site/fiche/18315

Centre Québecoise pour la valorisation des biotechnologies
www.cqvb.qc.ca

Cinematheque Québécoise
www.cinematheque.qc.ca

Consortium for Research and Innovation in Aerospace in Québec
www.criaq.aero

Daniel Langlois Foundation
www.fondation-langlois.org

Ex-Centris
www.ex-centris.com

Hexagram
www.hexagram.ca

INRS-Énergie Matériaux et Télécommunications
www.emt.inrs.ca

Laboratoire de communications et d'intégration de la microélectronique
www.lacime.etsmtl.ca

McCord Museum of Canadian History
www.mccord-museum.qc.ca

McGill Cancer Centre
cancercentre.mcgill.ca

McGill Centre for Bioinformatics
www.mcgill.ca/mcb

McGill Centre for Intelligent Machines
www.cim.mcgill.ca

Montréal Centre for Experimental Therapeutics in Cancer
www.ctecm.ca

Montréal In-Vivo
www.montreal-invivo.com

Montréal International
www.montrealinternational.com

Montréal Museum of Fine Arts
www.mmfa.qc.ca

Musée d'art contemporain de Montréal
www.macm.org

Québec Biotechnology Innovation Centre
www.cqib.org

Regroupement Stratégique en Microélectronique du Québec
www.resmiq.org

Villes, Régions, Monde
www.vrm.ca