INDUCING SPONTANEITY: HIGH-TECHNOLOGY LED DEVELOPMENT IN FALSE CREEK FLATS

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Bachelor of Arts (Geography), Simon Fraser University, 2000

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE STUDIES
SCHOOL OF COMMUNITY AND REGIONAL PLANNING

We accept this thesis as conforming to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

December 2002

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Date December 19th, 2002
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Abstract

High-technology and information technology industries represent a growing component of 'new economy' sector activities. Cities around the world often perceive these industrial and commercial activities to be high-growth in nature, bringing economic advantages and benefits to the cities where they are situated within. Concentration of high-technology and information technology economic activity in cities has resulted in the formation of local strategies and related policy initiatives aimed at attracting these sector industries into designated areas. Initial problems that ensued revolved around questioning the legitimacy, effectiveness and appropriateness of implementing these policy initiatives, which were characteristic of 'induced' development. Impacts on broader issues regarding the city's space-economy and structure were often not taken into account in these implemented high-technology led strategies and policies. This thesis responds to these problems by addressing the planning imperatives of initiating high-technology sector led development in urban environments.

False Creek Flats was the primary case study examined in this thesis. Due to the proximity of the False Creek Flats site to Vancouver's metropolitan core, a research concentration on the inner-city is carried throughout the thesis. The research objectives and question are aimed at examining challenges posed to planning by following a particular policy and city initiated development path for high-technology sector concentration in False Creek Flats. Objectives are focused around the purpose of conducting a policy analysis on the process and initiatives for high-technology policy formation that occurred over the past decade in False Creek Flats.

The research methodology consisted of gathering relevant and informing data and theories through an academic literature review. Information derived from editorial sources was also utilized to situate issues directly related to the primary case study. City of Vancouver policies, documents and sources represented a majority of the primary sources pertaining to the policy analysis of the high-technology framework for False Creek Flats. An internship conducted with the City of Vancouver Central Area Planning Division contributed to gaining access to information and planning perspective on the Flats high-technology led strategy.

The stated imperatives to planning are based on False Creek Flats high-technology led strategy's classification as a primarily induced development. Imperatives exhibited in the policy framework formation and details are the importance of the proactive and assertive stance taken by the City of Vancouver and Planning Department. Flexibility, evolution and innovation to formulate new planning responses to deal with the problems and opportunities of implementing high-technology initiatives in the Flats were found to be essential. Planning implications for this case study include the ability to examine the issues from a broader perspective to take into account ramifications on existing city policy, structure and function. These planning elements are going to be critical in maintaining the original guiding principles, vision and goals for high-technology sector concentration in False Creek Flats.
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Chapter One

Introduction: Context, Structure and Components

1.0 Narrative

High-technology firms and related activities are thought of as comprising an industrial sector where invention and innovation contribute to Shumpeter's notion of 'creative destruction'. Industries at the cusp of innovation are viewed as influential forces of change within the economic sectors and metropolitan cities they operate in (Hall, 1998). These expectations of high-technology industries result in local planning and regional policy initiatives aimed at the development of high-technology sectors as an economic growth strategy. Predicting the behavior of high-technology firms with respect to why these sectors choose specific places and correspondingly, how the industry is shaped by its locational context remains a difficult task. Numerous theories have emerged out of academic research attempting to explain characteristics of high-technology sector location. Although this is common in academic research, problems arise when attempting linkages from academia to commercial and industrial public policy. Planners and policy makers that consult academic literature are left with the task of synthesizing key points and creating or adjusting policy for the development of a high-technology sector sensitive to the context of a particular place.

Academics first theorizing about locational characteristics of high-technology industry looked to concepts developed by Alfred Weber and Joseph Schumpeter. Their analysis of innovative industries was from a growth pole perspective utilizing concepts of neo-classical economics (Hall, 1998). The second wave of literature concentrated on looking at the locational demands of high-technology firms and linking these needs with a
places ability or inability to meet these demands. This led to theories centered upon specific location factor, product-life cycle and product organization and location models. They were designed to explain the locational dynamics and behaviour of technology sector firms (Haug, 1990; Baptista, 1998; Scott and Storper, 1987). Recent research has focused upon the concept of ‘Innovative Milieu’ as being the critical component providing synergy and cohesion to any high-technology industrial complex or cluster (Aydalot and Keeble, 1988; Camagni, 1995). Academics have built upon the concept of innovative milieu in order to examine its implications with respect to high-technology cluster formation and technopole development, thereby underlining characteristics of place and a clusters ‘culture’ to identify a specific ‘milieu’ (Castells and Hall, 1994; Hall, 1998; Keeble and Wilkinson, 1999; Saxenian, 1989; 1994). The purpose of briefly reviewing literature provides context into the complexities of high–technology firm location theory.

Although many theories exist to explain the location of high-technology sector firms throughout the world, this thesis accepts that a defining characteristic of high-technology firms is their ability to cluster in close proximity to one another. Processes of clustering are some of the initial conditions present that are conducive to forming local advantages and conditions that high-technology firms can thrive upon. Manuel Castells has written extensively on topics of technology paradigm changes, informational societies, information cities and emerging new industrial spaces (Castells, 1996). In his writings, Castells’ admits that the communication revolution and formation of a new technological paradigm has resulted in the operation of society and economies around information flows (Castells, 1993). However, these flows of information and knowledge do converge in space. Metropolitan cities across the globe represent places of convergence, acting as production and distribution centers of information (Castells, 1996; Castells and Hall, 1994).
Perceiving cities as viable environments for high-technology industry is proving attractive to planners, policy makers, developers and high-technology firms. Reasons for this relate to the complex nature of high-technology based development. The high-technology sector is unique in that traditional notions of location theory, such as close proximity to suppliers and customers, remain important. At the same time, separation from traditional theories and practices and their replacement by new firm behavioural characteristics are constantly occurring. Therefore, a flexible, diverse location is required. This thesis views contemporary metropolitan cities and inner-city cores as centers for economic growth. They are environments conducive for the location and concentrated development of high-technology industry. Metropolitan settings continue to be adept at fostering innovation and are looked upon as dynamic, flexible entities in adapting to the changing needs of high-technology sector industries.

1.1 Problem Statement

Regions and major cities throughout Europe and North America have looked toward high-technology sector development as a means for revitalizing urban economies, increasing job growth and promoting the intensification of knowledge-based industries in a selected area. Given ‘formulas’ and development paths aimed at creating attractive conditions that favor high-technology led development are preconceived without any thought as to how they can influence the original purpose of high-technology initiatives. This thesis addresses the research gap into how policy initiatives and inducements pose imperatives to planning for the emergence and growth of a high-technology cluster.

An aspect of the high-technology sector that makes planning for it a complex task relates to high-technology firms ability to shift location while also being aware of the effect of
local place conditions on firm operations. For instance, high-technology firms are capable of shifting to different areas throughout a region. However, high-technology firms are sensitive to specific settings organized around space, office typology and local inducements (Henneberry, 1994). This thesis looks to the core of a metropolitan city and examines the imperatives of planning for a high-technology industrial complex and a general clustering of high-technology sector firms in a selected area. Research pertaining to the formation of high-technology focused spaces and complexes in the inner-city is crucial to understanding how sector firms, planning and other players involved react to such proposals. False Creek Flats is an area adjacent to the metropolitan core of Vancouver. The False Creek Flats initiative for high-technology led development is utilized as the primary case study in this thesis to apply the theoretical and analytical framework. This framework is utilized to explore the following research objectives and questions.

1.2 Research Objectives and Questions

This thesis examines the planning opportunities and imperatives for high-technology led development in Vancouver’s False Creek Flats. It evaluates policies, regulatory mechanisms and planning processes associated with the False Creek Flats high-technology initiative and examines the impact of implementing such a policy framework.

Research Objectives: An objective of this thesis is to create a framework of analysis appropriate for investigating clusters of high-technology firms and related activities within the context of an inner-city setting. The False Creek Flats initiative involving high-technology led development is used as the primary case study to which the analytical framework can be applied and referenced. A central component of the analytical framework that this thesis introduces is the concept of an induced versus spontaneous spectrum.
Further context to the framework is provided by external case studies of other high-technology clusters located in or close to the metropolitan core. The final component of the analytical framework is theories, definitions, concepts and data taken from academic sources on high-technology locational factors and behaviour. Applying the False Creek Flats initiative according to its characteristics and process of development allows for placement upon the induced versus spontaneous spectrum. This serves as a basis for comparison and assessment of the False Creek Flats case study.

These objectives provide an entrée to an examination of the following research question:

*Where does the False Creek Flats high-technology initiative locate itself on a spectrum of ‘induced’ versus ‘spontaneous’ high-technology firm cluster formation and how does this particular path of development influence planning for high-technology led development in the Flats?*

Some initial anticipated outcome of research directed toward these objectives is that in an inner-city setting high-technology sector firms should view this planning initiative as a unique endeavor dealing with issues of economic growth, land use control and property development. The Flats initiatives have implications for academic research as the case study covers theories about high-technology cluster formation, inter-industry linkages and innovative milieu. High-technology firms and related planning initiatives should embrace the advantages, diversity and flexibility of large metropolitan settings. A central question that remains is how far should inducements go before the risk to planning becomes too great.
1.3 Limitations and Scope of Thesis

This section outlines research limitations with respect to this case study of False Creek Flats. Planning policies, initiatives and guidelines for the area have been in the process of formation throughout the 1990s, yet their approval and implementation has not occurred until recently. In part, this contributes to the limited technology sector development currently ongoing in the Flats. As a result, this thesis is structured around an analytical policy perspective towards the recently designated zoning, land use and design guidelines developed for the Flats by the City of Vancouver’s Central Area Planning Division.

This thesis recognizes that there are pertinent issues outside the scope of the research objectives previously set forth. Notably, these relate to broader socio-economic concerns in regards to impacts of high-technology strategies on neighborhoods surrounding False Creek Flats. Acknowledgement of these issues occurs at the end of the case study in Chapter 5.

1.4 Research Methodology Overview

The following research methodology was utilized to investigate the research objectives and examine the primary research question posed in this thesis:

Academic Literature Review: Academic sources and references were compiled to form the literature review component of this thesis. The purpose of conducting an academic literature review is to provide information, concepts and theories that informs and helps structure the analytical framework based upon an examination of high-technology sectors in the inner-city. Academic sources on high-technology firm location patterns, industrial geography, technopole formation, science and research park development, industrial
property and socio-cultural industry characteristics were included as references to the False Creek Flats case study. Commentaries on the geography of innovation and innovative milieu are reviewed. Contextual information on the functioning of metropolitan cities and their ability to foster economic growth and concentrations of innovative sector industries is provided as well. Finally, case studies in, or outside of Vancouver are examined to better situate the primary case study. A review of outside cases helps explore the academic approach in addressing connections between real world examples and academic based concepts. The above-mentioned materials are considered secondary sources.

Editorial Material: Literature outside of academia was also reviewed. These sources often took the form of newspaper and magazine editorials. The topics covered either related directly to the False Creek Flats case study or to issues surrounding high-technology sector development concerns. It is important to note the opinionated nature of editorial sources. Information drawn upon from these sources was approached and utilized cautiously. The purpose of reviewing editorial material was to gather general data pertaining to current developments in the False Creek Flats area. Editorial material is considered a secondary source.

City of Vancouver Policies, Documents and Sources: As this thesis is structured around a policy analysis perspective, an extensive review of numerous City of Vancouver documents and policies was a necessary part of the research methodology. Information gathered from the city can be organized into two categories: 1) Policy statements 2) Technical/information reports. Policy statements include policies applicable to the False Creek Flats site or those having broader citywide influence. Zoning and land use designation, zoning district guidelines, land use definitions, concept plans and citywide
policies make up these policy statements. Informing technical reports are often associated with the process of creating formal policy in the City of Vancouver. These sources frequently take the form of reports to council by the planning department in regards to issues or development in the False Creek Flats case study. Both policy statements and informing technical reports are considered to be primary sources in the False Creek Flats case study.

**City of Vancouver Internship:** An internship with the City of Vancouver's Central Area Planning Division was a valuable experience from the perspective of gaining information and insight. During the months of May through September in 2001, an internship was conducted with the planning team involved in the False Creek Flats area. The internship provided access to important policy and related documents pertaining to high-technology initiatives in False Creek Flats. Important opinions and information about the planning process and policy formation by planners involved in the Flats was also gathered through informal interviews. Finally, the internship provided the opportunity to acquire current information on development projects and high-technology firms that were in the process of locating in the area or showing interest in doing so.

**1.5 Thesis Chapter Structure**

This chapter concludes with a description of the chapters comprising this thesis. As stated earlier, this chapter features background context in the aforementioned narrative and problem statement. Description of the research objectives, question and methodology is also provided. Chapter 2 presents the theoretical and analytical framework of this thesis. The academic literature review, 'induced' versus 'spontaneous' development spectrum and principal policy and research issues disclosed by the literature review makes up the content
in this chapter. Chapter 3 goes into more specific details of situating the False Creek Flats case study with relevant contextual information drawn from the City of Vancouver and surrounding region. Site history and details about the Flats offers important background for the remaining chapters. The two subsequent chapters form the substantive and analytical portions of this thesis. Chapter 4 describes policy framework details and planning processes surrounding the primary case study of high-technology led development in False Creek Flats. As the policy framework is laid out in this chapter, the False Creek Flats high-technology initiatives can be classified and located on the induced versus spontaneous spectrum. Imperatives to planning in False Creek Flats are presented in Chapter 5. Specific issues and concerns are also reiterated in this chapter to underline new planning responses that came about from high-technology sector development in the Flats. Chapter 6 represents the concluding chapter of this thesis. An overview of the material, issues and False Creek Flats case study is outlined to present the findings of the policy analysis and underline the importance of new planning responses. Discussion on the lessons learnt from planning in False Creek Flats concludes this thesis.
Chapter 2

Theoretical/Analytical Framework and Literature Review

2.0 Introduction

This chapter forms a theoretical framework of analysis appropriate for examining high-technology cluster led development in metropolitan and inner-city environments. A case study research focus is conducted on False Creek Flats in the City of Vancouver. A literature review comprised of material regarding high-technology sector development and its relation to location, spatial dynamics and urban development was undertaken. Sections in this chapter describe the relevance of literary material as it pertains to the theoretical framework and research objectives of this thesis. An induced versus spontaneous spectrum in relation to high-technology cluster formation is introduced as a conceptual portion of the theoretical framework in latter portions of the chapter. This serves to assist the classification of the False Creek Flats initiative and determine the planning ramifications and imperatives that ensue. The final section underlines policy and research issues disclosed by the literature review.

2.1 Literature Review

Material from books and periodicals are presented in this section, which forms the literature review component of this thesis. Ordering of the selected material is related to how various issues and concepts at broad scales connect with topics situated in specific places. For the purposes of this thesis it was chosen that contextual and analytical focus would be on the contemporary metropolis and inner-city settings. The rise of the information city and society (Castells, 1991; 1996) is introduced as a starting point followed by references stating the relevance of urban environments to high-technology sector...
concentrations. Firm behaviour and features of proximity, clustering and the functioning of an ‘innovative milieu’ (Appendix A) in high-technology industries forms the basis of the next sections. The final component of the literature review consists of reference cases underlining the characteristics of ‘technopoles’ around the world.

2.1.1 The Rise of the Information City

Manuel Castells is a leading scholar on the transformation of society and cities arising from forces of technological evolution and information revolution. Castells in a co-written book with Peter Hall (Castells and Hall, 1994) states three preconditions necessary for explaining the information city and society. The first is a technological revolution based on the formation of information and high-technology industrial sectors. The emergence of the global economy defined as “the structuring of all economic processes on a planetary scale” (Castells and Hall, 1994, p.03), is the second circumstance. The third precondition is the formation of a new industrial production system and process where the driving force of change is the generation and application of new knowledge (Castells and Hall, 1994). The existence of a technologically advanced society capable of innovation, producing new knowledge and absorbing the culture and products of an advanced economy are crucial to Castells’ concept (Castells and Hall, 1994). The information city is a place where the generation, transfer and application of new knowledge is concentrated and centralized (Appendix A)(Castells, 1993; 1996). Two concepts are introduced by Castells to further explain his theories: 1) The space of flows; 2) The new industrial space. Information flows manifest themselves in place and space. This concept is defined as material spaces where the structure of the space is constituted by the information systems that allow for the space of flows proper functioning (Castells, 1991, p.14). The new industrial space is related to the space of flows. Castells defines the new industrial space by stating that, “It is characterized
by the technological and organizational ability to separate the production process in different locations while reintegrating its unity through telecommunication linkages, and microelectronics-based precision and flexibility in the fabrication of components" (1996, p.386). Production paradigms based upon the space of flows and new industrial spaces are attached to specific cities as each place has a certain capacity and function to support or focus development in information driven activities and industries (Castells, 1996; 1991).

Many scholars have examined features of new industrial spaces throughout the world. Investigation tends to focus on a specific industrial activity or integrated production system linked not only to the product or service, but to the locale (Appendix A) it is situated in. Allen Scott (2000) in his book, The Cultural Economy of Cities looks at the characteristics of various cultural economic activities and their attachment to places within cities. Scott argues that as cities are natural concentrations for the production of culture, industries oriented to cultural production tend to agglomerate in certain large cities. This is underlined in the following quote:

Large cities in modern capitalism are typically the sites of leading-edge economic activity in the form of substantial agglomerations of industrial and business activity. These cities also represent nodes of location-specific interactions and emergent effects in which the stimulus to cultural experimentation and renewal tends to be high. In this context, many complex interactions between the cultural and economic are set in motion. Local cultures help to shape the character or intra-urban economic activity. (Scott, 2000, p.04)

Three features of cultural economic activities that entrenches these industries in certain cities and places are: 1) Dependence of production on localized networks of small to medium-sized firms; 2) The importance of local labour markets in cultural economic activities; 3) Agglomeration economies (Appendix A) evident in cultural economic
activities serves as an advantage to the industries made possible by city environments (Scott, 2000).

Information technology and high-technology firms are the primary industrial sector examined by this thesis. The most important elements in this section that has emerged are the geographical characteristics of new industrial spaces. It was found that in the functioning of an economy based on information generation, transfer and capacity, new industrial spaces are still very much attached to place, as were traditional industrial sectors (Castells, 1996; 1991; Castells and Hall, 1994). However, information technology industries' behaviour in new industrial spaces varies significantly from old economy firms. In the following section, attention is focused on the importance of the metropolitan city in the formation of urban high-technology sector concentrations. The goal is to further explicate the notion of high-technology sector industries attachment to specific places and environments as locales in metropolises act as attractive nodes for high-technology development.

2.1.2 The Importance of Metropolitan Settings

The focus now shifts to examining the importance and relevance of metropolitan environments in planning for high-technology sector development. In an era of global competition, cities and regions are positioning themselves to ensure that they function strategically in a setting where local initiatives and dynamics have ramifications upon how a place connects with global 'space' (Castells, 1996; Storper, 1993; Pope, 2002). Edward Malecki in Technology and Economic Development (1997) outlines two drivers of development in modern metropolises. The first is job creation with the second being the
cities structural and economic transformation into advanced manufacturing and innovative based production (Malecki, 1997).

Reasons for underscoring the importance of urban places are numerous. The literature reiterates that the city is a natural growth center for new and emerging economic activities to develop. Metropolitan environments are strategically positioned to compete with other cities and capitalize upon high-technology and information technology sector industries (Castells and Hall, 1994; Hall, 1998; Malecki, 1997). Peter Hall offers a historical analysis exploring the notion of how a particular innovative locale (Appendix A) can transform a city’s function in Cities in Civilization: The City as Innovative Milieu (1998). His examination of the development of six different cities over the last 250 years gives insight into how urban environs foster innovative industries as well as having these same sector industries change the function and structure of the city. Hall emphasizes that the cities and regions examined “are characterized not by an abundance of fixed resources, but rather by a set of developed social and cultural structures favourable to conceptual advances” (Hall, 1998, p.302). He concludes from his analysis of the six case-study cities that each had a specific ‘milieu’ conducive to innovation and development of that particular metropolis. Innovative milieu (Appendix A) was found to be an influence in capitalist development as each milieu has a distinct dynamic and characteristic (Hall, 1998). The concept of innovative milieu is examined further in latter sections of this chapter. Hall’s perspective allows for the bringing together of numerous elements such as labour, markets, social relationships and innovative processes. This allows for an understanding on how the metropolis or place came to be the focal point of growth for city shaping sector industries (Hall, 1998).
The importance of urban environments with respect to contemporary technology driven economic development is exhibited in Manuel Castells and Peter Hall’s (1994) writings on specialized industrial space oriented around high-technology sector industries. The authors termed these specialized places and regions ‘technopoles’ in which their form and function differed depending upon the context, place and situation they were located within. Although they maintained that technopole-oriented spaces represented a new type of industrial complex that operated under unique conditions, Castells and Hall stress that many major metropolises continue to be dominant centers for technologically driven, innovative industries in regards to their national economies (1994, p.145). Cities identified as centers for high-technology industry were London, Paris, New York, Tokyo, Munich and much of the region in and surrounding the cities of Los Angeles and San Francisco. A reason cited by Castells and Hall for the emergence of cities as “critical agents of economic development” (1994, p.07) is that cities, more so than any governing body or institution, are more flexible and receptive to the sensitive nature of niche-markets, technological advancements and social relationships which embody the high-technology sector. The crucial concept introduced by Castells and Hall is the importance of the urban technopole as a new driver for development and structural change in the metropolis. An essential component of this concept is realizing that urban and inner-city sites offer attractive spaces for technopole formation and growth (Castells and Hall, 1994). This reinforces the cities position as a high-technology sector center.

Edward Malecki (1997) cites evidence to support claims of the metropolis as being strategically positioned for high-technology led development and the formation of an urban technopole. For instance, large cities generate economic advantages for high-technology firms through the agglomeration (Appendix A) of producer and specialized services.
Malecki (1997) identifies situated agglomerations of producer and specialized services as crucial to high-technology sector development. Another economic advantage that cities possess is the concentration of a capable, market supply of highly skilled labour, which is key to maintain competence in innovative processes and technical change. Malecki (1997) states that large cities are able to maximize advantages of having large and diverse labour markets that results in further concentrations of high-technology industries as well as producer and specialized service firms to support this sector. Association of high-technology industry location in large cities is for the most part true in the Canadian context. Toronto, Montreal and Ottawa account for 66% of the national total for industrial research and development (Britton, 1996). As a result, a majority of high-technology sector production and manufacturing are located in Canada's largest urban centers. The following sections in this chapter move away from focusing on the metropolis and begin to analyze smaller scale aspects of what makes high-technology firms unique and how these attributes manifest themselves spatially in metropolitan settings.

2.1.3 High-Technology Firm Behavior: Exploring Spatial Proximity and Clustering

This section investigates characteristics and dynamics of high-technology firms identified by the academic literature. The primary purpose is to relate high-technology firm behavior to spatially 'grounded' notions of *proximity* and *clustering* (Appendix A). This thesis states the following definition for high-technology sector industries:

*High-technology* is used to refer to firms and industries whose products or services embody new, innovative and advanced technologies developed by the application of science and technological expertise. Such firms almost invariably regard such expertise and resultant technological leadership as the firm's leading competitive advantage, and are usually identified in practice by high research & development (R&D) intensity. (Keeble and Wilkinson, 1999, p.03)(Appendix A)
A distinguishing feature about the high-technology sector that the literature stresses is its separation from traditional Fordist industrial classification. Flexible forms of production have arisen due to the demand for 'mass customization' epitomized by shorter, more frequent product life-cycles and the emergence of niche-markets (Hayter, 1997; Malecki, 1997). High-technology industrial sectors that embody flexible production modes often have these principles reverberate deeper into firm attributes of labour, organizational structure and linkages with suppliers, customers and related firms.

The *industrial organization* (Appendix A) exhibited in high-technology firms underlines their separation from traditional industrial classification. This is exhibited with respects to employment and high-technology firm size. Small and Medium-Sized Enterprises (SME's) make up a majority of high-technology firms in this sector. This classification relates to firms with fewer than 500 employees (Longhi and Keeble, 1999). The dominance of SME's in high-technology sectors is demonstrated in British Columbia where 95% of sector firms have less than 50 employees (SCBC, 1995). Due to the smaller nature of firms, many have chosen to specialize in a particular service or niche-market due to the demands of a diversified and divided high-technology market. The smaller size of firms also allows them to remain flexible to meet new or changing market demands (Longhi and Keeble, 1999). Entrepreneurship also relates to firm size as many high-technology company start-ups are initiated by a key individual, who is able to identify a market niche or role for their business (Saxenian, 1994; Castells and Hall, 1994).

Another aspect related to defining the characteristics and dynamics of high-technology firms is the actual production process. A feature that quickly emerges is the horizontal organizational hierarchy of firm employees who are not separated by skills, but
organized into specialized project teams (Saxenian, 1994; Pratt, 2001b). Combining aspects of firm size, entrepreneurship and organizational hierarchy results in the defining feature of inter-firm relations. This aspect of firm networking, where information and skills are transferred, is referred to by academics as essential to high-technology firm competitiveness and flexibility (Saxenian, 1994; Miller and Cote, 1987; Pratt, 2001b). Andy Pratt (2001b) in his work on the organization of new media firms in the South of Market area of San Francisco examines and emphasizes the importance of team production processes oriented around specialized projects.

In concluding this section on high-technology firm characteristics, it is important to identify the more generic features of high-technology industry. The most prominent feature relates to the composition of labour. High-technology sectors are completely dependant on the supply of appropriately skilled labour that can either be provided within the region or brought in externally. Regardless of the firms operation, high-technology sector labour must maintain a high-degree of flexibility with respect to tasks, projects and job description (Malecki, 1997). Firms involved at the innovative stages of product creation demand an extremely highly skilled labour force made up of scientists, engineers, computer technicians, graphic designers, and market analysts depending upon the product and market focus of the firm. For SME’s the labour force is often solely composed of highly skilled employees due to the specialized product or services provided by the firm (Saxenian, 1994; Haug, 1991). Related to labour composition is the research and development (R&D) capabilities of a high-technology firm. In general, high-technology oriented firms reconstitute a larger proportion of resources to R&D than conventional industries (Saxenian, 1994). Academic institutes serve a dual purpose to high-technology firms. They are excellent sources for R&D and knowledge generation while at the same time supplying
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highly skilled labour. As a result, many firms and institutions are committed to maintaining active linkages between academia and industry as a means to entrench economic advantages. Associations between firms and various academic institutes in science and technology oriented business parks throughout the world evidence high-technology industry and academic institutional linkages (Castells and Hall, 1994; Shearmur and Doloreux, 2000; Massey et. al., 1992). In the following section the focus shifts to how high-technology firm characteristics and behavior transmit themselves into spatial aspects of proximity and cluster formation.

A defining locational feature of high-technology sector firms is their attachment to a specific space or place and dependence on spatial proximity that relates to cluster formations of high-technology activity. The metropolitan city was underlined earlier as an area of concentration for this thesis as many sector leading clusters of high-technology industry and technopole development took place within urban environments (Hall, 1998, Castells and Hall, 1994; Voyer, 1998). Perspectives generated from industrial geography research point to the accumulation of competitive economic advantages due to influences of spatial proximity and cluster development. Therefore, urban environments are able to capitalize upon spatial proximity. Urban areas possess a concentration of skilled labour, specialized services, local suppliers, markets, R&D institutes and general knowledge resources located within the cities limits making proximity a key competitive advantage (Voyer, 1998). At this point it is important to emphasize that the existence of an urban or metropolitan setting does not by de facto lead to the formation of high-technology clusters. Peter Hall (1998) and Miller and Cote's (1987) historical perspective on the development of a city's industrial heritage highlights the importance of how the existing and past industrial structure may or may not prove conducive to high-technology led development. Specialized
services, labour, markets and R&D capacity along with very specific urban settings are required for successful high-technology cluster formation.

A key issue raised throughout the academic literature on high-technology sectors is how, through the collection of firms, services and other supply-side factors, competitive economic advantages arise. The most common theme that the literature addresses to answer this question is the relevance of agglomeration economies to high-technology industries. Agglomeration and the externalities and economies that occur are not recent phenomena. The formation of agglomeration theory can be traced to a man writing in the mid-twentieth century named Alfred Marshall. He describes agglomeration and its relation to industrial organization as follows:

When an industry has chosen a locality for itself, it is likely to stay there long; so great are the advantages which people following the same skilled trade get from near neighborhood to one another. The mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously. Good work is appreciated, inventions and improvements in machinery, in processes and the general organization of the business have their merits promptly discussed...And presently subsidiary trades grow up in the neighborhood, supplying it with implements and materials, organizing its traffic, and in many ways conducing the economy of its material. (Alfred Marshall, 1949 Qtd. In Feldman, 1994, p.03)

The premise of agglomeration economies remains important to contemporary industries as many advantages come about to firms that cluster together resulting in a concentration of demand and supply side resources (Feldman, 1994). Agglomeration economies (Appendix A) can be defined as a decrease in production costs and increase in productivity as a result of the location of related sector firms in close proximity to one another. Two terms synonymous with agglomeration economies are localization economies, which are economic advantages arising from firms in linked industries and urban economies resulting in benefits of locating in an urban locale (Appendix A)(Malecki, 1997; Baptista,
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1998). Some economic advantages derived from agglomeration economies are the increased intensity of information and capital exchange, spillovers of innovation, closer linkages with suppliers and markets and the concentration of appropriately skilled labour. These advantages help in the formation of a cluster of high-technology activities by contributing positive feedbacks and spillover effects that help insulate firms from market uncertainties (Malecki, 1997; Baptista, 1998; Swann, 1998).

The relevance of spatial proximity to high-technology sector industries relates to the capacity of these firms to transfer tacit and codified information (Keeble and Wilkinson, 1999). SME’s compose a majority of high-technology companies, which in part underpins the competence of these firms ability to link with related firms. This is amplified where spatial proximity exists (Aydalot and Keeble, 1988). In a book edited by Philippe Aydalot and David Keeble (1988), the authors stress that in the case of high-technology oriented industries proximity has taken on a more complex nature expanding beyond simple production efficiencies and into innovation networks, inter-firm socio-relations and formalized and informal firm linkages. The following section examines a concept that has emerged out of high-technology industries distinct patterns of spatial proximity and clustering that has attracted attention by scholars.

2.1.4 Innovative Environs: Exploring Milieu and Synergy

In the study of various high-technology clusters and concentrations throughout the world, exploring innovative-based firms encompassed by a certain ‘atmosphere’ has been the focus of research for the past two decades. Many academics conducting research in this field have arisen out of the European research group, GREMI (Groupe de Recherche European sur les Milieux Innovateurs), which have produced numerous books aimed at
exploring the concept of innovative milieu (Aydalot and Keeble, 1988; Camagni, 1991; Keeble and Wilkinson, 1999). Urban studies scholars have also written about innovative milieu and its role in shaping industrial spaces and city structure (Hall, 1998; Castells and Hall, 1994). For the purposes of this thesis, only a brief description of innovative milieu will be presented. Offering a definition, examining how high-technology firms create and react to a local milieu and exploring spatial implications will be the focus of this section.

A difficulty that academics have struggled with is recognizing appropriate scales and situations where the concept of innovative milieu is relevant. Flexibility in scale has been apparent in much of the literature, as concepts of milieu have been applied to regional contexts, cities, locales within cities and specialized industrial spaces. A significant feature evident in innovative milieu is represented through a localized industrial cluster and production system that displays various networks, firm linkages, cultural institutions and an embedded cultural heritage (Malecki, 1997). An innovative milieu does not simply rely on a reduction in transportation and transaction costs and generation of advantages through economies of scale. Rather it is some of the aforementioned networks and collective processes that reduce uncertainty, thus maintaining competitiveness in high-technology firms, which embody the key foundations of an innovative milieu (Camagni, 1991; Malecki, 1997). This thesis proposes the following definition of innovative milieu:

The innovative milieu concept focuses on innovation by firms as the key 'motor of growth' of local and national economies, and argues that innovation is fundamentally a collective process, innovation is a complex and interactive process, innovation stems from the creative combination of generic know-how and specific competencies, and territorial organization is an essential component of the process of techno-economic creation. (Bramanti and Ratti, 1997 quoted in Keeble and Wilkinson, 1999)

With this focus on innovation, innovative milieu is further defined as:
A set of territorial relationships encompassing in a coherent way a production system, different economic and social actors, a specific culture and representation system and generating a dynamic collective learning process whereby innovation is sustained and uncertainty minimized. The innovative milieu concept thus emphasizes the importance for firm innovative activity of inter-firm relationships, territorial socio-economic embeddedness, and dynamic local collective learning processes. (Camagni, 1991 quoted in Keeble and Wilkinson, 1999)(Appendix A)

Manuel Castells and Peter Hall, who link innovative milieu to aspects of industrial complex development, agree that the above stated definition best fits contemporary research requirements. However, it is important to note that many scholars point to innovative milieu as being a new theory of economic space that is still evolving and whose ramifications have not fully been explored or played out (Aydalot and Keeble, 1988; Castells and Hall, 1994).

A more apparent dynamic of how milieu may develop becomes evident when exploring spatial proximity. Simply put, factors of space, proximity, clustering and locale are extremely important to the creation of any innovative milieu (Aydalot and Keeble, 1988; Castells and Hall, 1993). Traditional industries relied on spatial proximity and clustering to reduce costs associated with distance dependent relationships. Development of milieu in high-technology sectors depends on the spatial proximity advantages associated with ease of information exchange, similar firm culture, collective learning processes and inter-firm cooperation (Camagni, 1991). Edward Malecki (1997) states these advantages as untraded dependencies that arise from extensive firm interaction in a given locale. Proximity through firm clustering and other modes of spatial concentration acts to amplify economic advantages and minimize uncertainties, thereby further motivating a local high-technology cluster to continue to form synergistic relationships conducive to its own innovative milieu.
2.1.5 Introducing a Typology of Technopoles

This section offers differing cases and types of technopoles that have emerged throughout the world. Doing so provides examples of how high-technology firms cluster and determines the linkage to factors such as innovative milieu, synergy, high-technology firm location and behavior discussed in previous sections of this chapter. Regional and larger scale technopoles remain important as a starting point, however their context and scale make them inappropriate for direct association with the False Creek Flats case study.

High-technology sector concentration in Silicon Valley California and Boston's Route-128 represent two of the most established technopoles in the world (Figure 2.1; 2.2). Their formation and development initiated research and writings on the dynamics of each technopole to determine the impact on high-technology sector growth and whether these qualities could be replicated elsewhere (Castells and Hall, 1994; Saxenian, 1994; Miller and Cote, 1987). In the regional agglomeration of high-technology establishments in Silicon Valley, academics such as Saxenian (1994) and Castells and Hall (1994) state the pioneering distinctiveness of this region. Features that made high-technology firms operation and structure unique were first implemented in Silicon Valley. Innovation and milieu coupled with practices of collective learning, shared firm culture, research concentration, linkages to academic institutions, labour skill and labour mobility epitomizes the characteristics that many other high-technology complexes and clusters have attempted to achieve since Silicon Valley's emergence (Saxenian, 1994; Miller and Cote, 1987). Many problems have emerged around this philosophy of attempting to replicate conditions distinctive to Silicon Valley or elsewhere in order to induce high-technology sector development. This is exemplified in cases where locales take one defining aspect of Silicon
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Valley, such as science and technology park developments, and implant them into the local economy expecting high-technology firms to cluster around them.

Science and technology parks have dominated the landscape of planned high-technology developments over the past two decades. Science and technology parks are property-based initiatives that form around spatially contiguous parcels of land. Their key features are: 1) location or close association with an academic or research institution; 2) emphasis on the development of knowledge or technology-based firms and organizations; 3) active involvement in the transfer of technology and information (Massey et. al., 1992; Monck, 1988; Luger and Goldstein, 1991). Science and technology parks are often smaller-scale developments, depending upon the size of land they are allotted. They are representative of a 'campus' like atmosphere with green space and amenities, which helps differentiate the industrial complex (Luger and Goldstein, 1991). Evidence from periodicals suggest that the attraction of high-technology firms to these developments due to academic institute linkages, R&D, business services and availability of high-technology oriented office space only represent minor locational factors for firms. Above all else, firms perceive the importance of image and being associated with a science and technology park as the primary determining factor for locating in one (Haug, 1991; Westhead and Batstone, 1998).

Significant debate has arisen about the impact of science and technology parks on high-technology sector growth, which will be addressed in latter portions of the section.

Inner-city sites have also experienced technopole development. Although high-technology clusters developed in this situation exhibit certain characteristics of science and technology parks, spontaneous development patterns epitomize these clusters. In San Francisco, the area South of Market Street have been termed 'multimedia gulch' due to a
clustering of multimedia and design based high-technology firms (Figure 2.3)(Pratt, 2001a; 2001b). Significantly smaller scale high-technology clusters exist in the Yaletown and Gastown districts of Vancouver as well as the Belltown area in Seattle (Figure 2.4)(Hutton, 2002; 2000; Pope, 2002). High-technology clusters modeled around planned science and technology parks in inner-city settings are a recent phenomenon. Some have started to emerge in the Mission Bay project in San Francisco, the Cite Multimedia project in Montreal and the City of Vancouver's False Creek Flats high-technology initiative (City of Vancouver, 1998a).

These case studies underline some debates surrounding the development of planned and unplanned technopoles. The central debate revolves around science and technology parks and other industrial oriented business parks as being property driven developments, where the construction or sale of office space dominates over all other motivations. Market forces and property development practices of profit maximization are often only regulated by municipal planning policies and zoning (Henneberry, 1994; Pratt, D., 1994). Municipal zoning is extremely influential, as many cities around the world have utilized land use regulation to guide or promote the formation of science and technology parks. Therefore, the central question is what set of factors would be best suited to drive high-technology sector development in urban areas. If property led schemes were driven by the market, sector downturns and practices of profit maximization may result in the construction of more 'flexible' rather than high-technology oriented office space designed to ensure profits for the developers (Henneberry, 1994; Pratt, D., 1994). A differing development pattern offers inducements varying from municipal land use regulations to tax incentives to attract high-technology firms and create specialized spaces for their location (City of Vancouver, 1998a). In these situations the issue that arises is whether interference
from municipal or institutional inducements are appropriate as developers and the market have to take these initiatives into account before proceeding. In either case of property-led schemes or municipal incentives, the key factor is determining if either strategy can create an operational high-technology cluster that contributes to overall firm formation and development. For the Canadian context of science and technology parks in urban areas it was found that most of these projects had no link to high-technology sector employment growth (Shearmur and Doloreux, 2000). This questions the effectiveness of science and technology parks as drivers of development. In the following section, aforementioned inducements will be elaborated upon and compared to spontaneous models of high-technology firm location.

2.2 Induced vs. Spontaneous Development: Introducing a Descriptive Spectrum

This section introduces the characteristics and features exhibited in induced and spontaneous patterns of development for high-technology cluster formation. Within the academic literature, scholars have written about premiere high-technology innovative centers and complexes while others have focused on analyzing various places attempts at developing their own concentration of high-technology sector growth. A trait exhibited in many of these cases is that certain attributes within the development can be linked to high-technology sector formation as being primarily driven by induced or spontaneous models of growth. A spectrum-based model was derived from the academic literature and consists of induced and spontaneous development patterns specific to the high-technology sector. Creation of this spectrum serves as part of the analytical framework where features of high-technology cluster development can be classified and structured. Another function of the spectrum is to provide a basis of comparison for the False Creek Flats case study. The
model limitations can be related to the defined induced and spontaneous ends of the spectrum. Although they represent the absolute 'pure' form of their respected development pattern, it is rare to find real world examples characteristic of entirely induced or spontaneous development. However, most high-technology clusters exhibit identifiable features that can be classified as induced or spontaneous.

2.2.1 Induced Development

Inducements for high-technology sector formation are aimed at concentrating resources towards creating a setting conducive to high-technology oriented firms and services. Although inducements are implemented in a variety of city sizes, the scale to which these initiatives are aimed at are quite specific. For example, science and technology parks are a primary mechanism for inducing high-technology led sector development. These parks are often property-based initiatives involving municipal governments and developers, whose goals are to create profitable, high-technology oriented space (Henneberry, 1994; Luger and Goldstein, 1991). Science and technology parks can be viewed an inducement as property is utilized as a supply mechanism to attract high-technology specific firms (Henneberry, 1994). Municipalities and their planning agencies utilize land use policies as influential inducements, guiding where high-technology space and sector development will be concentrated and what type of cluster may result (Luger and Goldstein, 1991). The culminating characteristics of property, land use zoning, science and technology park designation and availability of land leads many induced high-technology sector developments to be small scale in nature. Therefore, the boundaries of an induced high-technology cluster can be easily identified.
The involvement of government, institutions and high-technology firms are inevitable in any high-technology sector development whether they are considered induced or spontaneous. If agencies act as catalysts or initiate policies prior to high-technology cluster formation their classification as an induced development pattern can be confirmed. Science and technology park and land use designation are some of the more common catalysts. Others include the development and provision of firm incubator facilities, R&D establishments or the location of high-technology government institutions within an area (Miller and Cote, 1987). All of these initiatives can be viewed as a strategy for creating an environment aimed at attracting high-technology firms to a given location. Municipal governments have also utilized more extensive inducements in the form of tax subsidies and other fiscal incentives to attract leading sector high-technology firms to act as ‘anchors’ for redevelopment strategies or to simply promote high-technology growth. This was the case in San Jose where the municipality offered the Adobe software company approximately 40 million dollars in tax breaks for the firm to locate in the downtown core as part of an urban revitalization scheme (City of Vancouver, 1998a). A goal of inducements is to generate and present a high-technology sector image (Westhead and Batstone, 1998). However, associated qualities of prestige in a high-technology cluster does not always accompany the ‘high-tech image’ as it takes time to determine the resulting impingements or benefits caused by the inducements. Extensive active municipal planning and involvement throughout the cluster formation process epitomize induced high-technology sector development.

2.2.2 Spontaneous Development

Spontaneous development in the high-technology sector generally speaks to the lack of formalized institutional and government based policies and mechanisms designed to
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induce firm growth in a particular industrial segment or location. The key feature of spontaneous development is the allowance of individual and groups of firms to not only choose the initial location, but also shape the functioning, internal dynamics and external relationships of the high-technology growth concentration thereafter. The renowned example of a spontaneous high-technology sector concentration is in the Santa Clara Valley, California. This region is known as Silicon Valley (Saxenian, 1994). Formation of a spontaneous high-technology oriented cluster or region can frequently be traced back to a single event, influential individual or innovative firm that initiated an agglomeration of sector industries and related activities. Such was the case in Silicon Valley where the creation of the Stanford Research Park, formation of the Fairchild semi-conductor firm and the later spread of talented engineers and scientists from this pioneering firm into new, but related endeavors produced a series of events that indelibly shaped Silicon Valley (Castells and Hall, 1994; Saxenian, 1994; Castells, 1996).

Compared to its induced counterpart, identifying the spatial boundaries of spontaneous high-technology concentrations is much more complex. Varying scales contribute to the difficulties. For instance, large regional agglomerations of sprawling spontaneous development patterns are exhibited in California’s Silicon Valley and Massachusetts’ Route 128 (Figure 2.1; 2.2)(Saxenian, 1994). However, small-scale clusters with identifiable boundaries have emerged in many large cities. Metropolitan cores and historic districts within inner cities often are the choice for many of these smaller clusters. North American examples are present in San Francisco’s South of Market district, New York’s Silicon Alley, Seattle’s Belltown and Vancouver’s historic district of Yaletown (Figure 2.3; 2.4)(Pratt, 2001a; 2001b; Pope, 2002). Availability of vacant land is not so much an issue in spontaneous than in induced development. The market often reacts and
provides the appropriate space needed for high-technology firms as developers move to gain profits from the construction or conversion of leasable office and production space.

The time period for the formation of spontaneous clusters is quite long, which results in an extensive embeddeness with the local economy and city. Embeddedness in the local socio-cultural industrial character is invaluable to the formation of formal and informal networks among related high-technology firms. Therefore, a set of preexisting conditions of labour capacity, firm practices, available services and key entrepreneurial individuals are attractive to spontaneous development. Terms of ‘innovative milieu’ and ‘synergy’ are mostly associated with spontaneous driven clusters due to the fact that the growth of high-technology sectors and their entrenchment in certain places occur simultaneously causing them to adapt to each other’s needs. Many of these production networks in spontaneous clusters would not have been possible without a strong local attachment to place. Therefore, a final and defining feature of spontaneous high-technology development is the ability for the industrial sector cluster to create an image, prestige and atmosphere key to maintaining its efficient functioning and attraction of new firms to ensure growth (Saxenian, 1994; Swann and Prevezer, 1998; Swann, 1998; Aydalot and Keeble, 1988). Planning at the spontaneous side of the spectrum is more reactionary to high-technology driven development as cluster formation and growth works with existing planning regulations and guidelines. To conclude this chapter, the final section examines policy and research issues disclosed by the literature.

2.3 Principal Policy and Research Issues

This section underlines principal policy issues and research imperatives that are relevant to the thesis’ case study on False Creek Flats. Most of the policy implications
disclosed by the literature focuses on the role of government intervention through policy mechanisms and how the market and those involved in the high-technology sector respond. As stated earlier, a primary means of intervention by municipal governments is through the support or initiation of property-based high-technology sector projects. One of the key questions posed by the literature is whether interests involved in property development, such as developers, investors and municipal bodies, coincide with the interests of high-technology industrialists (Pratt, D., 1994; Henneberry, 1994). For instance, it appears contradictory for property-led high-technology schemes to be able to take into account the needs of all stakeholders involved. Property developers and investors who concentrate on the creation of high-technology space are inevitably driven by profit and can shift high-technology driven property schemes into more flexible, speculative office projects. Conversely, high-technology firms require very specialized environs and office space that may not be profitable or attractive enough for property developers to consider. The attached risks are far less for municipal authorities, yet governments still have to realize that these types of property development schemes may result in local planning initiatives being responsible for the creation of highly specialized office or production space for which there is no demand (Pratt, D., 1994; Henneberry, 1994). The principal policy issue that arises is how property-led initiatives are or are not appropriate for intervening in areas where the market has failed to provide.

The attraction of property-led development policies by municipal governments remains as many local authorities feel that this mode of development allows for control over local economic development through property regulation (Jones, 1996). Science and technology parks are viewed skeptically by the academic literature as being projects oriented towards the development of property and economic revitalization of an area rather
than for the concentration of firms and resources to foster innovation (Massey et al., 1992; Shearmur and Doloreux, 2000; Westhead and Batstone, 1998). One critique of science park developments is determining the actual effectiveness of these projects at real job growth and firm creation in high-technology sectors. Shearmur and Doloreux (2000) in their examination of Canadian science parks in urban contexts stress that limited linkages exist between science park location and related job growth in high-technology sectors, thus providing evidence towards the argument that science and technology parks are focused on property development. This underlines some of the secondary impacts of science and technology park formation that are overlooked such as how policy inducements may contribute to regional disparities by concentrating high-technology sectors in one locale, thereby taking it away from surrounding areas (Malecki, 1997).

Recent policy initiatives have undergone a significant shift in the past decade. Formerly, government policies at national, regional and municipal levels concentrated on macro-economic stabilization policies aimed at reducing employment disparities and unemployment. Policies initiated at the local level utilized high-technology sectors as an economic growth strategy to counter structural post-industrial changes that were occurring in the city (Malecki, 1997). Governments, institutions and non-governmental organizations have reoriented their policy towards building effective economic growth processes rather than more direct economic strategy provisions of property and monetary inducements. The creation of knowledge and innovative capacity has been a major goal to which policy mechanisms have been aimed at (Malecki, 1997; Keeble and Wilkinson, 2000). To achieve these goals, governments have focused resources into R&D institutes, academic-industrial partnerships and innovation-based firm creation. Innovation policies often operate at the national level and are still considered an aggressive economic strategy to create or maintain
international competitiveness (Malecki, 1997). Regional and local oriented policies involve analyzing a locality's embeddedness within an existing industrial structure to determine a city's capacity for high-technology sector growth. Many of the resulting policies concentrate on creating an atmosphere conducive to knowledge transfer and forming learning regions of local and regional systems of innovation (Malecki, 1997; Mothe and Paquet, 1998). In summary, the recent shift in policy direction has been organized around attempts at developing institutional mechanisms and focusing resources towards the creation of various localized high-technology clusters operating on principles of milieu and innovation.

2.4 Conclusion

This chapter presented several sections in the academic literature review to form an expanse of information on the changing structure of cities and industrial spaces, which are also being influenced by the emergence of high-technology sector industries. Certain places and metropolitan sites were elaborated as key growth centers for high-technology sector concentration. To further analyze why city and urban settings were so attractive to high-technology firms it was necessary to study their characteristics and operational behavior. Spatial proximity and clustering were discussed as an essential aspect making it possible for high-technology firms to function in the way they do. Innovative milieu was introduced as a concept to help bind together influences of metropolitan urban settings, high-technology firm features, spatial proximity and reiterate the importance of distinct industrial spaces and places. Examples of high-technology industrial complexes and growth centers were provided in the section on technopole development. The literature review formed the basis for the introduction of the induced versus spontaneous spectrum pertaining to the differing patterns and forces behind high-technology industries spatial concentration. Final discussions focused upon a review of recent policy issues disclosed by
the academic literature. These three sections containing the literature review, induced
versus spontaneous spectrum and policy issue assessment forms the analytical framework
of this thesis. From this framework, attention can be directed to the primary case study.
The following chapter provides important background information to situate the False Creek
Flats case study.
Figure 2.1: Silicon Valley, California and Surrounding Counties and Cities.

Silicon Valley and Environs

Source: Saxenian, 1994
Figure 2.2: Route 128, Boston and Surrounding Counties and Cities.

Source: Saxenian, 1994
Figure 2.3: South of Market District, San Francisco.

Location of high-technology firms (Multimedia businesses) in the South of Market District compared to proximate areas in San Francisco.

Source: Parker and Pascual, 2001 (San Francisco Planning Department)
Figure 2.4: Creative and Technology Service Firm Clustering in Yaletown, Vancouver

Source: Hutton, 1998; Brail, 1994
Chapter 3

Situating the False Creek Flats Case Study

3.0 Introduction

This chapter provides contextual and background information directly relevant to the False Creek Flats high-technology led initiative. It assists in situating further analysis in the following substantive chapters of the thesis. The topics covered involve exploring the space-economy patterning of Vancouver’s metropolitan area, examining related city policies that were affected by and had impacts on the city’s space-economy and introducing the False Creek Flats site. Five sections are arranged to accomplish these objectives. The first and second sections outline Vancouver’s space-economy structure and underlines City of Vancouver policies that influenced the downtown areas current arrangement. The third section presents a broader picture of high-technology oriented initiatives and projects in surrounding municipalities of the Greater Vancouver Regional District (GVRD). Importance will be placed on issues of municipal and regional policy conflict in regards to high-technology sector development. The final two sections provide information on the evolution, formal planning and spatial boundaries of the False Creek Flats site.

3.1 Vancouver’s Space-Economy

This section identifies the industrial and economic composition of the central metropolitan core of Vancouver in which high-technology led development in the Flats may become a functioning part of in the future. 'Space-economy' is a term utilized to describe the spatial patterns and characteristics of various economic and industrial sectors (Appendix A)(Hutton, 1998). Discussion around Vancouver’s economic composition leads into a description of the city’s existing high-technology activity locations.
The Post-War economic and industrial picture of Vancouver was comprised of a core head office complex for B.C.’s resource industry and inner-city manufacturing. Warehousing and resource extraction industries were located around the False Creek Basin and harbour waterfront areas on Burrard Inlet (Figure 3.1)(Hutton, 2002; Barnes et. al., 1992). Tom Hutton (1998) identifies five influential factors of change in Vancouver’s economy and city structure in a recent study. These were: 1) Rapid economic, population and employment growth and change 2) Large levels of capital investment from the mid-1980s onward 3) High-levels of immigration (Asia-Pacific region) 4) Local architecture and urban design influences 5) Public policy initiatives and planning guidelines (Hutton, 1998, p.104-5). The contemporary picture of Vancouver’s central core and proximate areas is vastly different due to these five influences. Although Vancouver lacked a traditional ‘Fordist’ manufacturing sector, the city’s heavy industries were made up of resource processing, warehousing and city serving manufacturing (Barnes qtd. in Hutton, 1998). This industrial structure minimized the impact of deindustrialization in the city during the 1970s. However, Vancouver was not completely insulated against the effects of declining industrial activities in the inner-city. Throughout the 1970s it became apparent that the city’s resource oriented and heavy manufacturing industries were becoming obsolete resulting in a stagnation of derelict activities in districts around False Creek and areas east of the downtown core. This set the stage for municipal policy initiatives that would significantly shape the downtown core and proximate areas (Hutton, 2002).

Vancouver’s space-economy consists of a rapidly changing pattern of commercial and industrial districts. At the same time there are remnants of functioning past activities still evident in the metropolitan core. The concentration and diversity of economic and industrial activities and the areas ability to act as a control point further embeds advantages
in the metropolitan core over the rest of the GVRD (Hutton, 1998). Industrial activities oriented around warehousing, wholesaling and distribution remain functioning enclaves in fringe areas proximate to the downtown core such as in the Port of Vancouver. The Central Business District (CBD) and commercial office hubs in and around the downtown peninsula represent the largest agglomeration of office space, commercial activities and supporting services in the entire region. Finally, a unique aspect about Vancouver’s core that has arisen in the past decade has been the emergence of specialized service and industrial clusters acting as new economic growth areas within the core (Figure 3.2). Composition of the industrial base, commercial nodes and specialized service industry clusters provides information on the current space-economy of Vancouver’s central area (Hutton, 1998).

Service activities and the rise of specialized industrial clusters throughout downtown merits more detailed discussion as it represents an important characteristic of Vancouver’s space-economy. During the industrial decline of the 1970s and 80s, Vancouver went through what Tom Hutton (2002) states as a period of hyper-specialisation where there was “an acceleration of a longer-run process of functional specialization within which overall growth of services was succeeded by the expansion of higher-order services and contraction of more routinised tertiary activity” (p.17). These processes have culminated in defining Vancouver as an advanced services production economy with many of these operations locating in the core or adjacent districts (Hutton, 1998). Reasons for this particular space-economy pattern is that service activities require extensive and embedded markets, access to information and highly-skilled labour, which can be provided most effectively in a metropolitan setting (Hutton, 1998). In order to service a consolidated CBD, Vancouver has experienced significant growth rates in finance, insurance and real estate sectors of the economy compared to other Canadian cities of Toronto and Montreal (Hutton,
The landscape of service and specialized industrial clusters in Vancouver's central area can be attributed to municipal planning policies. Investment from the Asia-Pacific region is also a primary driver of the contemporary structure of Vancouver's space-economy (Barnes et. al., 1992). The next section looks into identifying the high-technology and information driven sectors of the economy in Vancouver’s central area.

High-technology industries are a relatively small sector in Vancouver and contribute moderately to economic growth in the region. According to 2001 statistics, the high-technology sector exhibited generally higher growth rates than other B.C. provincial sector industries. High-technology sector industries contributed 3.9% of the provinces total gross domestic product. An interesting figure on employment reveals that over 75% of high-technology sector jobs in B.C. are service oriented (46,600) while the remaining 25% consist of high-technology manufacturing (14,290) employment. This states the importance of service and producer oriented high-technology firms in the province. In terms of location, the Lower Mainland (Includes Vancouver and GVRD municipalities) region remains the high-technology growth and concentration center in B.C. High-technology firms prefer to establish in this area due to the populous and capacity of the region to absorb, foster and service sector growth. The Lower Mainland accounts for two of every three high-technology establishments in the province while seven out of every ten new establishments locate in the Greater Vancouver region (B.C. Statistics, 2001). The central area core of Vancouver exhibits high-technology sector concentrations located in a variety of areas.

Many service and specialized industrial clusters have grown up around the CBD as the downtown area has emerged as an attractive location for high-technology firms. Shauna Brail’s (1994) MA thesis examined the agglomeration of creative service firms,
which are part of producer service activities, in the districts of Yaletown and Victory Square in Vancouver’s core. Activities include firms involved in graphic design, industrial design, architecture, printing and publishing related fields as well as supporting service oriented businesses (Hutton, 2000; Brail, 1994). It was found that clusters of creative service firms were important to overall economic growth and restructuring in the City of Vancouver with land use policies having impacts on the creative service districts examined (Brail, 1994). Although the CBD accounts for a few sporadic locations for high-technology firms, proximate and outlying districts in the central area appear to be the primary locations for high-technology establishments (Hutton, 2002). Over the past decade many high-technology sectors involved in design and creative producer service activity have started to cluster in certain districts in the central area, thereby becoming a distinct part of Vancouver’s space-economy (Hutton, 2000, p.300). These districts include the CBD, Gastown, Yaletown, Victory Square, Triangle West, Downtown South, Granville Island and the West Broadway commercial strip (Figure 3.3; See also Figure 2.4)(Hutton, 2000; Brail, 1994). The following section discusses the influence of city policies in the development of Vancouver’s space-economy.

3.2 Related City of Vancouver Policies: Post 1991

Although many policies can be highlighted as contributing to Vancouver’s space-economy, this section keys in upon three that have been influential for the city’s overall development. The first is the City of Vancouver’s Central Area Plan (CAP) adopted in 1991. The second set of policies relates to the formation of historic districts within and around the downtown core. The final policy is the Industrial Lands Strategy of 1995.
The City of Vancouver's CAP (1991) is essential as this has been the one comprehensive policy that has shaped the land use structure and permitted uses throughout the entire central area since 1991. For the purposes of this section and thesis, only some of the defining features of the CAP are briefly discussed. One of the most important goals of the CAP was to delineate the spatial boundaries that would make-up the central area. This resulted in the inclusion of areas in the downtown peninsula, around the False Creek Basin as well as historic districts that were proximate to the CBD. The Central Broadway commercial district was also included in central area's boundary (City of Vancouver, 1991). The CAP eliminated from its planning mandate most of East Vancouver including the neighbourhoods of Strathcona and Grandview-Woodlands. False Creek Flats is not directly referred to be included in the CAP boundaries, but this 300 acre site is considered to be located in a downtown fringe district in relation to the CBD and borders the CAP delineated area (Figure 3.4)(Hutton, 2002).

Three initiatives of the CAP that proved to be decisive in structuring the downtown peninsula and proximate areas were: 1) Consolidation and creation of a compact CBD in Vancouver 2) Create and preserve space for supporting service and commercial activities throughout the central area 3) Dramatically increase the supply of housing throughout the central area, thereby focusing development around high-density residential projects (Figure 3.5)(City of Vancouver, 1991). Impacts of the CAP during the past decade have been significant. Four features of development spaces, defined spatially and by function, have been identified by Tom Hutton (2002) in an examination of planning in Vancouver's central area. The first distinct feature is the emergence of service industry clusters and other core commercial based activities throughout the central area. Mega-projects comprised of residential high-rises represent the second trait of the evolving landscape of downtown
Vancouver since the inception of the CAP. Planning is actively attempting to define various mixed-use commercial and residential spaces comprised of multiple, unconsolidated land owners. These districts are termed by Tom Hutton (2002) as major unconsolidated housing projects. The fourth feature of the central area landscape that has emerged since the 1991 CAP are frontier planning areas that are mostly located in districts proximate to the downtown core (See Figure 3.2)(Hutton, 2002). The high-technology led development vision for False Creek Flats is considered a frontier planning district, as many of the initiatives have not been attempted in this inner-city context. Furthermore, the formation of any high-technology cluster within the Flats is outside the current scope set forth in the current CAP and would have extensive ramifications on job growth, housing, transportation and other established service industry clusters throughout the central area. The purpose of outlining the CAP for the City of Vancouver was to state the principal policy that has shaped the downtown core. This provides context into how planning is approached in the central area and situates False Creek Flats within Vancouver's planning landscape.

A second set of city policies that have influenced the formation of specialized service activity clusters and overall space-economy are the historic land use designations in Gastown and Yaletown. Throughout the 1980s and 90s, the City of Vancouver initiated land use designation to protect districts, whose history and character were distinct. The historic districts of Chinatown, Gastown and Yaletown were protected through land use designations (See Figure 3.4). Protection of the physical character and structure as well as limiting conflicting uses was the primary mandate of the heritage policies (City of Vancouver, 2002a). Initiation by the City of Vancouver to protect historic character areas proved to be very important in the following years as these districts formed a concentration of certain activities that inevitably contributed to the creation of specialized service activity
clusters spread throughout Vancouver's space-economy (Hutton, 1998; 2000; 2002; Brail, 1994). Gastown and Yaletown have an established concentration of design, architectural and creative technology services and activities throughout their districts (See also Figure 2.4)(Hutton, 2000). Reasons for the concentration of certain economic sectors in these districts are still debated, yet some point to the attraction of design, creative and technological oriented production firms to historical character warehouse districts. Buildings in these districts may be more conducive to specialized service firms as they allow for more flexible and open office space configurations (Hutton, 2000; 2002). Tom Hutton states the legitimacy of this claim in the following:

As the Vancouver case vividly illustrates, design firms and creative services tend to cluster within certain reconstructed precincts of the urban frame, rather than within the CBD proper, reflecting both sociocultural as well as economic features of agglomeration and, to some extent, rent differentials. (Hutton, 2000, p.310)

Although Vancouver's historic character zoning never intended for a concentration of specialized activities or services, the False Creek Flats initiatives do, at the outset, identify an industrial sector for the Flats. Therefore, the historic designation policy of Vancouver offers a comparative example of evaluating the difference between less intrusive policies and more spontaneous market driven development, highlighted in the Gastown and Yaletown character districts. A more intrusive and active planning position is taken in the False Creek Flats case that attempts to induce activities into the area.

The final piece of contextual policy material that this chapter presents relates to one of the earliest initiatives by the City of Vancouver to determine a future for the Flats area. This policy document is the Industrial Lands Strategy (ILS) of 1995 (City of Vancouver, 1995). The overall objectives of the ILS was to take an inventory of Vancouver's industrial lands, develop a policy framework for determining their importance and form a development
strategy to take into account the changing nature of industrial activities. The ILS identified seven industrial districts, including False Creek Flats, within the City of Vancouver that served port/river related industries and city serving oriented industries (Figure 3.6) (City of Vancouver, 1995). Protecting and maintaining the current use of all industrial districts was the main recommendation of the ILS. As transportation, storage and warehousing activities dominated False Creek Flats, the ILS determined that this area should be retained in order to service the city and that a development strategy should be implemented throughout the Flats (City of Vancouver, 1995). Christina DeMarco was the planner responsible for the development of the ILS. Her report and eventual policy stressed that many industries in the Flats oriented around freight receiving and distribution activities were not obsolescent, thus supporting her argument to retain industrial land designation in the area. Data with respects to types of employment in False Creek Flats supports DeMarco's and the ILS's argument against industrial uses either as obsolescent or in the initial stages of becoming so. In 1991, activities in the Flats provided 3,000 jobs of the city's total industrial based employment of 45,000. Employment in the area consisted of a range of workers from skilled trades, management, technicians, clerical and professional occupations. Although transportation and storage represented over half of the land uses (53.9%) in the Flats, significant portions of land with wholesale (24.5%), manufacturing (8.2%) and office (7.9%) activities existed (City of Vancouver, 1995; 1996a). Data of this nature provides context into informing the recommendations made by the ILS policy.

The ILS set the stage for a process that would determine the extent of change that was going to occur in False Creek Flats. The emergence of high-technology as a growing industrial sector could be related back to one of the ILS goals of taking into account the changing nature of industry. High-technology industry was, at this point, a well-entrenched
sector of Vancouver's space-economy. The next step was determining whether the Flats represented an appropriate area for high-technology sector development. In summary, the ILS provided a point of contrast to supporters of high-technology led development schemes. Some planners emphasized the importance of maintaining the Flats city serving industrial activities rather than attempting to induce high-technology firms into the area. The following section provides further context from the regional perspective of the GVRD.

### 3.3 A Snapshot of the High-Technology Sector in the GVRD

This section presents a broader picture to situate the False Creek Flats case from a regional perspective in the GVRD. The focus will be on looking at neighbouring municipalities to Vancouver and briefly examining some of their land use and policy initiatives aimed at forming high-technology growth concentrations. Debates have emerged in regards to conflicting municipal and regional viewpoints on high-technology sector development, which will be stated in this section.

Compared to the aggregate total of high-technology firms and jobs in all GVRD municipalities, the City of Vancouver can be considered the high-technology sector center for the region. However, surrounding municipalities have been developing land use strategies and other incentives to attract high-technology oriented businesses. Qualities of 'campus' like atmosphere, proximity to transportation routes, quality of life and decreased costs compared to the metropolitan core are stated as advantageous features by municipalities competing for high-technology sector growth. Two municipalities whose success has been marked in this approach are the City of Richmond and City of Burnaby. Zoning and land use designation by Burnaby are the major planning mechanisms utilized by the city to attract high-technology business. They have created special suburban and urban...
business park designations and advanced technology research districts with established zoning regulations controlling uses and various physical components relevant to each site (City of Burnaby, 2002). The planning department in Burnaby refers to these high-technology business parks as 'business centres', with a total of eight such developments throughout the municipality. Compared to its metropolitan counterpart in Vancouver, Burnaby boasts a significant amount and variety of high-technology oriented industries (City of Burnaby, 2002; BCTIA, 2000).

The City of Richmond has also been active in strategically planning for high-technology industry. Although Richmond's land use strategies are less established and developed than Burnaby's, there bears a resemblance between the two municipal approaches. The City of Richmond has utilized a suburban business park designation oriented around the city's largest high-technology development. This business park is Crestwood Corporate Plaza located on the outskirts of Richmond's built out area (City of Richmond, 2002). The industrial strategy for the City of Richmond includes future designation of specific sites for high-technology oriented office and production space in the form of specialized land use zoning promoting business park developments (City of Richmond, 2002).

From the regional perspective of the GVRD, debates have emerged over differences between regional oriented policies of the GVRD and municipal strategy and actions with respect to high-technology sector development. The main reason for outlining this conflict between regional and municipal perspectives is that it helps immerse the False Creek Flats high-technology initiatives into regional planning problems to which the development contributes too. The GVRD bases its planning outlook and course of action on the strategic
policy document entitled 'The Livable Region Strategic Plan' (LRSP) (GVRD, 1996). In terms of planning for industry concentrations, job creation and economic growth, the LRSP sets forth guidelines and stated goals for municipalities as well as the entire region to follow. According to many of the objectives stated in the LRSP, the GVRD prefers to see high-technology led sector development within established 'regional town centres'. The intent is to instill concentrated growth patterns in these designated town centers (GVRD, 1996). Therefore, as high-technology industry is a relatively fast developing sector in terms of economic growth and job creation, the GVRD prefers this sector to locate in established commercial concentrations with adequate infrastructure (GVRD, 2000).

Municipalities do not always follow the regional doctrine of the GVRD. A clear example of this is exhibited in the prior mentioned cases of Burnaby and Richmond. In both cases, the municipalities had focused industrial land use policy for the high-technology sector around the formation of business parks in which a defining feature is their distinct spatial and physical separation from proximate city activities and structure. The very nature of suburban business parks negates their location within town centers as desired by the GVRD. In the case of Richmond, planning is being undertaken to establish high-technology sector industrial zones in areas well away from the GVRD’s designated town center for the municipality (City of Richmond, 2002). Gaps between regional and municipal high-technology industrial sector outlooks will be an ongoing debate in False Creek Flats development. The final two sections of this chapter look at False Creeks Flats history that includes a current description of site boundaries and activities.
3.4 False Creek Flats History: Site Activities and Formal Planning

False Creek Flats has been an integral part of Vancouver’s development, urban structure and space-economy over the past century. This section briefly states the changing function of False Creek Flats and examines some of the formal planning initiatives and resulting activities. False Creek Flats was named after a marsh lowland area east of the False Creek Basin. In 1890, the Flats were considered part of the basin, but by 1930, human influences had modified False Creek and separated the Flats from the False Creek shoreline that one sees today (Oke et. al., 1992). Storing industrial wastes and dumping fill from dredging operations became one of the main features of False Creek Flats in the earlier part of the century. At the time the Flats were considered a nuisance, as the area had no possibilities of becoming a useful harbour and posed problems for road construction as development spread around the creek basin. This muddy marsh area filled with sewage and industrial wastes were a stark contrast to the natural lowland ecosystem that had existed before (Oke, et. al., 1992). The condition of the False Creek Basin, the Flats and industrial activities operating in the area were considered a civic nuisance. A key turning point for False Creek Flats occurred in 1918 when railway companies interested in locating terminals on the site cleared the marshland and filled in approximately 221 acres, thereby eliminating any lowland portions that were once considered part of the eastern tidal flats of False Creek (Oke, et. al., 1992). Decisions by the railway companies to locate two major terminals to service Vancouver in the Flats was one of the first formal activities to situate in the area. These rail terminals would influence the character of the Flats over the early and mid-portions of the 20th Century, as many activities would be oriented around servicing the terminals.
Due to the railroad operations and terminals in the Flats, remaining land was utilized as warehousing, storage and other infrastructure facilities to service the rail companies needs (Oke, et. al., 1992). Compared to the rest of Vancouver's urban and economic structure, False Creek Flats role was to service some of the warehousing, storage, light manufacturing and transportation needs of the city. These features were dominant during the early 20th Century, when the rail terminals were constructed, until about 1970 in which natural changes to city structure influenced many of the city serving industrial sites within and around the False Creek area that included False Creek Flats.

Technical changes in freight handling and storage significantly influenced the Flats. Containerization and its transport by forklifts and straddle trucks led to an obsolescence of many of the storage facilities in False Creek Flats. New facilities located in other areas of the GVRD that consisted of either single-storey structures or completely vacant lots, which proved to be more feasible than the older, compact, multi-level warehouses that were in the Flats and other parts of the city (North and Hardwick, 1992). Therefore, the primary function of the Flats as a rail terminal and storage area was declining as the site began an era of transition. Recent formal planning initiatives for False Creek Flats began in the early 1990s with the approval of the Central Area Plan in 1991. The most important aspect of the CAP was how it formally designated a boundary for what was to be considered part of the central area. Parts of East Vancouver including Strathcona and Grandview-Woodlands were deleted from the planning mandate of the CAP (Hutton, 2002; City of Vancouver, 1991). These boundary designations by the CAP placed False Creek Flats in a border or fringe area (See Figure 3.4). However, the Flats proximity to the downtown peninsula and subsequent direction for the area set forth by the Central Area Planning Division situates False Creek Flats within the direct influence of the CAP. False Creek Flats can be
considered a 'frontier' planning area in terms of its objective for high-technology led development and the sites fringe location to the downtown core (Hutton, 2002).

The Industrial Lands Strategy (ILS) of 1995 was also a significant policy stating the importance of False Creek Flats transportation, warehousing and storage operations for the effective functioning of the city. The ILS also demanded a mandate into developing a strategy for any future changes in development or direction undertaken in the area (City of Vancouver, 1995). Until high-technology policy initiatives for the Flats occurred, the ILS represented one of the recent formal planning endeavors applicable to the area and was considered a conflicting policy to high-technology development objectives in the Flats. These conflicting ideals will be elaborated further in following chapters.

3.5 A Contemporary Snapshot of False Creek Flats

This section presents an account of the current activities and site details for False Creek Flats to provide final particularities with regards to situating the case study. The entire area designated as being part of False Creek Flats consists of just over 300 acres of land. This contiguous parcel of land is located just inland from the eastern shore of False Creek. The following street network make-up the Flats spatial boundaries. Station Street represents the western boundary of the Flats. The northern boundary consists of Prior Street and Malkin Avenue. Clark Drive is considered the eastern border while Great Northern Way on the southern edge of the Flats completes the boundary (Figure 3.7)(City of Vancouver, 2002b). The street network within the site lacks continuity compared to the surrounding urban street pattern. This can be attributed to the active rail terminals and infrastructure requiring large unbroken plots of land. Many of the activities throughout the Flats consist of warehousing facilities, which serve as a staging area for shipping and
distribution (City of Vancouver, 1996a). Other commercial activities specializing in contracting and construction goods and services are located along Terminal Avenue, which is a major spine road running east-west thru the site. A prominent feature of the Flats is the frequency of vacated buildings and cleared plots of land. There are two railway lines running into False Creek Flats. The inactive line located in the area south of Terminal Avenue was formerly the CN owned and operated line. The active passenger and freight rail line is located north of Terminal Avenue.

**3.6 Conclusion**

The primary objective of this chapter was to present broader background material to situate subsequent analysis on the False Creek Flats case study. Vancouver's evolving space-economy was described to relate how commercial and economic activity in the Flats would interact with the city's existing economic structure. Three city policies were briefly examined to provide contextual material for the Flats case study. These city initiatives consisted of the Central Area Plan (1991), historic designation of Gastown and Yaletown Districts and the Industrial Lands Strategy (1995). This section stressed how significantly city policies could influence the overall structure of the city and positions planning as a profound force in Vancouver. Regional context was stated to underline the importance of the GVRD's policy stance on high-technology led economic development. Cases in Burnaby and Richmond were mentioned to provide information on how surrounding municipalities were approaching high-technology development. Conflicts between GVRD perspectives and municipal policies acting in direct contradiction of regional objectives highlights problems associated with municipal strategies for high-technology sector development. The final sections looked at the history, formal planning, boundaries and activities in the False Creek Flats site. Subsequent chapters begin the examination of the
policy framework and planning process for high-technology led development in False Creek Flats.
Chapter 3: Figures

Figure 3.1: The Economic, Industrial and Residential Structure of Vancouver’s Metropolitan Core and Surrounding Environs at Mid-Century.

Source: Hutton, 2002
Figure 3.2: The Contemporary Space-Economy of the Metropolitan Core of Vancouver Summarizing the Formation of Service Industry Clusters and Major Residential Projects.

**Service industry clusters**
1. CBD (consolidated 1991)
2. New cultural & entertainment district
3. Robson "destination" retail district
4. Yaletown - applied design, IT retail & residential, lofts
5. Professional sports complex - GM Place & BC Place
6. Convention centre & cruise ship terminal
7. Gastown heritage area (lofts, retail)
8. Chinatown heritage area (commercial)
9. Central waterfront - Port of Vancouver
10. Victory Square - heritage & SRO district
11. Granville Island Public Market
12. South of Granville Island - specialty retail
13. Dennar specialty retail & restaurant
14. 4th Avenue specialty retail & restaurant - Kitsilano
15. West Broadway Commercial
16. Wall Centre
17. Medical precinct (part)

**Residential "mega" projects**
A. Pacific Place - Concord Pacific
B. Citygate
C. International Village
D. Coal Harbour

**Major (unconsolidated) projects**
E. Downtown south
F. Granville Slopes
G. Triangle West

**Central area 'frontier planning' areas**
H. Southeast False Creek (sustainable "redevelopment")
I. False Creek Flats (High-Tech District)
J. Multi-university High-technology Consortium

Source: Hutton, 2002
Figure 3.3: Location of Design and Creative Service Firms in Selected Districts of Vancouver's Metropolitan Core.

Source: Hutton, 2000; Brail, 1994
Figure 3.4: City of Vancouver's Boundary Designation and Sub-Area Division for the Central Area.

Map A: CENTRAL AREA SUB-AREAS

DOWNTOWN PENINSULA
1. Bayshore
2. Established Central Business District
3. Central Business District: Fringe
4. Chinatown
5. Coal Harbour East
6. Coal Harbour West
7. Downtown South
8. Downtown South: Burrard-Granville
9. Downtown South: Granville Street
10. Downtown South: Northeast Quadrant
11. False Creek North: Apex
12. False Creek North: Cambie Bridge
13. False Creek North: Granville-Cambie
14. False Creek North: International Village
15. False Creek North: Stadium
16. Gastown
17. Granville Slopes

OUTSIDE DOWNTOWN PENINSULA
18. Port Lands
19. Triangle West
20. Victory Square
21. West End
22. Yaletown
23. Broadway: Centre
24. Broadway: Cambie Bridge South
25. Broadway: East
26. Broadway: West
27. Burrard Slopes: Broadway-Burrard-Granville (C-3A)
28. Burrard Slopes: South of Granville Island
29. Fairview Slopes
30. False Creek East
31. False Creek South
32. False Creek Southeast
33. Granville Island
34. Mt. Pleasant Industrial

Note: These areas are generalized. There may be individual sites or portions of areas which vary from the generalization. This will become evident in detailed planning.

Source: City of Vancouver, 1991 (Planning Department, Central Area Division)
Figure 3.5: Goals and Land Use Policy for Vancouver's Central Area Plan (1991).

Map C: NEW CENTRAL AREA LAND USE PLAN

Central Business District
Uptown Office District
Heritage Area
Residential Neighbourhood
Heritage Character Area
"Choice of Use"/"Mixed Use"
Light Industry
Skytrain line and station

Notes: These areas are generalized. There may be individual sites or portions of areas which vary from the generalization. This will become evident in detailed planning. Retail, parks, and institutions are not included on this map.

This is an illustrative summary of the policy contained in this plan.

Source: City of Vancouver, 1991 (Planning Department, Central Area Division)
Figure 3.6: Industrial Lands Strategy's Designation of the False Creek Flats Industrial Area.

Source: City of Vancouver, 1995 (Planning Department, Central Area Division)

Figure 3.7: Spatially Defined Boundaries for the False Creek Flats Case Study.

Source: City of Vancouver, 2002a (Planning Department)
Chapter 4

The False Creek Flats High-Technology Led Initiative:
Planning Process and Policies

4.0 Introduction

This chapter begins the case study examination of high-technology led development in the City of Vancouver's False Creek Flats area. Prior chapters focused on outlining the analytical framework applicable to the case study examination. These concentrated on laying out the general characteristics of high-technology firms, how they operate within clusters, their role within a city's space-economy and states academic concepts on the industrial geography of information technology and other 'new economy' sectors. Chapter four and the ones to follow represent a significant break from earlier sections of this thesis as focus turns to substantive and analytical content.

Since 1995, much debate and action has occurred in regards to new directions for the False Creek Flats area. This culminated in the formation of a high-technology sector vision for the site. Significant portions of the Flats were dedicated for these activities in the hopes of high-technology sector concentration. The objective of this chapter is to describe the policy framework, land use mechanisms, planning process and conflicting perspectives about implementation of initiatives in False Creek Flats. The first two sections return to the primary research objective underlining relevance to the False Creek Flats case study. As a result, the induced versus spontaneous development spectrum is revisited so that the case study can be classified according to the spectrum's structure. A description of land use regulations and remaining guidelines contained in the policy framework for the Flats is explored in the third section. The fourth section places importance in the outlining of
institutional issues and planning processes. Differing perspectives over the Flats future are presented as the final section in chapter four.

4.1 **Linking the Primary Case Study with the Research Objective**

Before an in depth examination of the False Creek Flats case study occurs, it is vital to revisit the primary research question. This research question is stated as follows:

*Where does the False Creek Flats high-technology led initiative locate itself on a spectrum of 'induced' versus 'spontaneous' high-technology firm clustering and how does this particular path of development influence planning for high-technology led development in the Flats?*

The nature of this thesis is constructed around being a policy, institutional and procedural analysis, which is driven by research objectives aimed at evaluating components of planning in False Creek Flats. Classification according to a spectrum of induced versus spontaneous development applicable to the False Creek Flats study area is the first objective of this thesis. The second objective stated in the research question is approached from an evaluative perspective. Taking details about the False Creek Flats high-technology initiatives and stating the imperatives to planning that follow achieve this.

It is important to note that analysis of policy and process is undertaken in hindsight after a majority of the policy framework was formed. Although planning and discussion of high-technology firm concentration in the Flats took place since the mid 1990s, formal policy designation for the area was not finalized until 1999. Formal land use designation in False Creek Flats did not complete policy development as many more specific planning initiatives
are being implemented after the broad policy groundwork was laid out. The next segment focuses on answering the first portion of the primary research question.

4.2 Classifying the False Creek Flats Initiative on the Spectrum

Development in False Creek Flats around high-technology sector industries represents an assertive initiative and vision for the area taken by the City of Vancouver. Certain elements of the False Creek Flats case study are representative of development paths taken by other municipalities in attempting to attract high-technology sector firms. However, features of inner-city location, proximity to Vancouver's downtown core and the potential impact that high-technology initiatives poses to Vancouver's space-economy make it a unique challenge to planning. The intent of this section is to revisit the induced versus spontaneous spectrum constructed earlier in order to locate and classify the False Creek Flats policy initiative according to this framework.

From the perspective of the induced versus spontaneous development spectrum, False Creek Flats can be broadly classified as an induced driven development. As stated in Chapter 2, induced development is epitomized by the concentration of resources and adjustments to the regulatory framework in order to provide an attractive setting for the high-technology sector. It is important to note that in this development path, inducements are established prior to any high-technology sector formation in the area. A defining quality in the case of False Creek Flats is the active role of the City of Vancouver and specifically the Central Area Planning Division in orchestrating these initiatives. The City of Vancouver remains a very active stakeholder in the visioning and planning of False Creek Flats. This proactive planning position exemplifies the False Creek Flats initiative as an induced development. Planning mechanisms and regulations initiated by city staff and ratified by
council are designed to act as catalysts for the concentration of high-technology sector activities within the Flats. They are manifested through land use designation and area specific zoning for portions of the Flats. Land use designation and zoning designed specifically for high-technology sector office space requirements prior to any location of sector firms in the area presents further evidence toward its classification as an induced development. Partnerships involved in False Creek Flats planning are also a form of inducement. In past large-scale, mega-projects in the City of Vancouver, partnerships among city staff in the planning department, developers and property owners were a key component of the project (Hutton, 2002). This is the case in the City of Vancouver’s leading initiative in the development of False Creek Flats. For instance, during the planning leading up to the specialized industrial land use designation, partnerships were formed between municipal agencies and private stakeholders such as project developers and property owners (City of Vancouver, 1998a). These partnerships helped initiate the planning process and policy that ensued. Recently, new partnerships have emerged whose primary function has not been to assist in process, but to serve as an attraction or inducement to private investment. An example of this is in a consortium partnership among four academic institutes on a site designated as a high-technology district in False Creek Flats. The function of this partnership is to provide a conducive environment to high-technology firms who might gain from the industrial and academic linkages formed by the consortium (Ward, 2001). Therefore, partnerships provide an attractive environment for investment from the high-technology sector, which is consistent with characteristics of induced development.

Market function also serves as a good indicator to the nature of development in False Creek Flats. In spontaneous development patterns, the property market takes a reactive role resulting from the extensive demand for high-technology oriented production
space. In induced development the property market plays a much different role. Instead of reacting to the demand for high-technology oriented space, property market and private developers are actively creating a supply of appropriate space in order to induce or attract potential and existing high-technology firms to a particular site. This market approach to property development has been undertaken throughout the areas zoned for high-technology activity in False Creek Flats. This further entrenches the classification of the False Creek Flats case as being a primarily induced development. A final point that is linked to property’s influence in the False Creek Flats policy undertaking relates to the identification of spatial boundaries for the clustering of high-technology firms and activities that may locate in the Flats. In spontaneous development, spatial boundaries for concentrations of high-technology activity are complex and difficult to recognize. Spontaneous patterns of high-technology cluster formation are epitomized by an attachment to a specific place, district or region and the qualities attached to it rather than to a large site or plot of property (Saxenian, 1994; Hall, 1998; Aydalot and Keeble, 1988). In cases of induced development, spatial boundaries can be much more recognizable as projects are often oriented around property based science and technology parks. Any such development or project that goes forth in False Creek Flats will be located within the spatial boundaries created by land use policy, thereby placing any clustering of high-technology activity on the induced side of the spectrum.

To summarize, the False Creek Flats initiative has been classified as an induced development based on the framework described in Chapter two. Without the role of planning and high-technology visioning for the Flats, the area would have remained as it was a decade ago. Therefore, planning acted as a catalyst in order to create an attractive
environment conducive to high-technology sector development. Following sections in this chapter describe the formation of the policy framework for False Creek Flats.

4.3 The High-Technology Planning and Policy Framework in False Creek Flats

This section underlines the City of Vancouver policy statements and planning mechanisms created and implemented in the False Creek Flats site, which makes up the policy framework for high-technology led development in the Flats. Much of the information in this section pertains to describing the land use and zoning mechanisms that compose a majority of the policy framework for the case study area. Examination of changes to land use policy and the attached planning process is dealt with in subsequent sections.

The False Creek Flats site has gone through numerous zoning and land use changes in the past decade. As stated in Chapter 3, much of the Flats activity composition in the 1990s consisted of medium to light city serving industry. Zoning prior to 1996 throughout much of the Flats was classified as either an M-1 or M-2 Industrial District (City of Vancouver, 1996a). The following states the general intent of these zoning districts:

**M-1**: The intent is to permit industrial and other uses that are generally incompatible with residential land use but are beneficial in that they provide industrial employment opportunities or serve a useful or necessary function in the city. It is not the intent, however, to permit uses that are potentially dangerous or environmentally incompatible when situated near residential districts.

**M-2**: The intent is to permit industrial and other uses that are generally incompatible or potentially dangerous or environmentally incompatible when situated in or near residential districts but are beneficial in that they provide industrial employment opportunities or serve a useful or necessary function in the city. (City of Vancouver, 2002a)

The two zoning districts are differentiated by light industry (M-1) and heavy industry (M-2) (City of Vancouver, 1996a). Discussions about the changing nature of industry and the
need to update the City of Vancouver’s industrial zoning after some of the issues were raised by the Industrial Lands Strategy of 1995 led to the rezoning of a majority of the Flats to an I-2 designation in 1996. In False Creek Flats, there are few heavy industrial or environmentally hazardous material operations. As the area was characteristic of light industrial activity that was more compatible with surrounding residential districts, the changes to the zoning were deemed necessary (City of Vancouver, 1996b). The general intent of the I-2 zoning district schedule is stated as follows:

The intent of this schedule is to permit industrial and other uses that are generally incompatible with residential land use but are beneficial in that they provide industrial and service employment opportunities or serve a useful or necessary function in the city. It is not the intent, however, to permit uses that are potentially dangerous or environmentally incompatible when situated near residential districts. (City of Vancouver, 2002a)

A limited number of high-technology uses and related manufacturing activities are permitted in the I-2 zoning.

By the late 1990s, significant discussion and debate took place around the creation of a specialized high-technology industrial zoning for portions of False Creek Flats. The result was the creation of two distinct land use designations with separate zoning district schedules encompassing a total land area of 125 acres over the False Creek Flats site. The zoning designations were the I-3 industrial district and comprehensive development zoning bylaw (CD-1(402)) for the proposed technology park along Great Northern Way (City of Vancouver, 1999a; 1999b; BCTIA, 2000). The CD-1 (402) zoning termed the Great Northern Technology Park is the property formerly owned by the Finning Corporation located along the southern margins of False Creek Flats. Total area is 26 acres at this site. The I-3 zoning designation consists of continuous parcels of land along the western margins of the Flats with narrow strips of property running along the southern boundary of the site.
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(Figure 4.1; 4.2). Total area encompassed by the I-3 industrial district zoning is about 100 acres. The remaining area in the Flats east of Thornton Street and north of Industrial Avenue and Great Northern Way have kept their I-2 industrial district zoning established in 1996. The aforementioned land use designations compose the current zoning for False Creek Flats.

Examination of the two separate zoning designations designed specifically for high-technology led development in the Flats is conducted in the following sections. These are: 1) The I-3 district schedule zoning 2) The Comprehensive Development (CD-1 (402)) zoning and development bylaw establishing the Great Northern Technology Park. Elements to be described are the general intent, permitted activities, regulations with respect to building height, floor space ratio and any other details that make these zoning districts unique to high-technology development.

4.3.1 The I-3 Industrial District Zoning and Development By-law

The I-3 industrial district zoning was created by the City of Vancouver’s Planning Department at council’s request (City of Vancouver, 1998b). Approved in 1999 and applied to just over 100 acres along the western portion and southern margin of False Creek Flats, its implementation through city initiated rezoning replaced the I-2 land use designation. The purpose of the I-3 industrial district schedule is stated as follows (See Appendix B):

I-3 District Schedule: The intent of this schedule is to permit high technology industry, and related industry with a significant amount of research and development activity. It is also the intent to permit light industrial uses that are generally compatible with high technology and other industrial uses, and with adjoining residential or commercial districts. (City of Vancouver, 1999a).

Some of the key components of this zoning district schedule are the introduction of new use definitions related to the high-technology sector. These uses are: 1) Information
Technology 2) Software Manufacturing and 3) Laboratory, which are defined by the City of Vancouver as follows:

**Information Technology**: Means the development or production of computer software, and the design or research of computer, electrical, electronic or communications equipment, and similar products.

**Software Manufacturing**: Means the use of premises for manufacturing computer software in bulk, and includes copying, packaging, storing and shipping.

**Laboratory**: Which means the use of premises not providing service directly to the public for the provision of analytical, research or testing services, including biotechnologies and energy and environmental technologies, but does not include Photofinishing or Photography Laboratory. (City of Vancouver, 2002a; Zoning by-law definitions)

The inclusion of this terminology accompanied by the City of Vancouver's interpretation and legal definition is a significant departure from other industrial districts around the city. It is the only zoning to include and define use activities according to research and development intensiveness and information technology office functions.

Activities within the I-3 district schedule that are permitted as outright approval uses are specifically oriented to many of the production, manufacturing, office and service function demands of high-technology firms. Compared to other industrial district zoning schedules in Vancouver, the type and amount of outright approval uses in an I-3 district is limited. Outright uses permitted for manufacturing are stated as: Electrical products or appliances manufacturing, printing or publishing, software manufacturing and miscellaneous products manufacturing – Class B (City of Vancouver, 1999a; City of Vancouver, 2002a; Zoning and Development By-law Definitions). Outright uses also permit general office functions, however they are limited to information technology activities. General office use by accountants, lawyers, notary publics, real estate, advertising, insurance, travel and ticket
agencies are prohibited in the I-3 zoning. For services, outright approval uses include laboratories, photofinishing or photography laboratories, production or rehearsal studios and workshops (City of Vancouver, 1999a). Most of the conditional uses permitted relate to the original intent of the I-3 zoning district schedule in allowing light industrial activities so long as they are compatible with each other and surrounding commercial and residential districts (City of Vancouver, 1999a).

Various regulations are stated in the I-3 zoning district schedule with respects to building height and floor space ratio. These regulations are some of the basic controls and mechanisms that the planning department has implemented in False Creek Flats. They ensure that guidelines conform to the normative standards established in the high-technology sector with respects to desired density as well as building layout, structure and function. A maximum building height designation of 18.3 meters is permitted, however, a building up to the height of 30.5 meters may be constructed with permission from the director of planning or development permit board (City of Vancouver, 1999a). High-technology office and production space require buildings with larger floorplates rather than narrow tall buildings (City of Vancouver, 1998a). Furthermore, taller buildings in the Flats may disturb view corridors and have shadow impacts on surrounding areas. Floor space ratio is a computation of the buildings total floor area compared to the entire site area to which the building is located. For most of the outright approval uses stated earlier, the maximum allowable floor space ratio is 3.0 for office, manufacturing, transportation, storage, utility, communication, wholesale and service uses. The floor space ratio remains 1.0 for all other uses combined (City of Vancouver, 1999a). There are also regulations with respect to placing a maximum allowable area to certain office and accessory uses to ensure that they do not dominate as the principal use in the building. In 2001, amendments were proposed
and approved for the zoning in regards to changing the floor space ratio guidelines. Rather than permitting densities up to 3.0 FSR for uses identified as falling within outright approval, planning recommended that FSR not be permitted above 1.0. However, buildings would be considered to maximum densities of 3.0 FSR with permission from the development permit board. The reason for the amendments was to ensure that planning had more control over design guidelines as these regulations were essential in ensuring that buildings in the I-3 zoned portions of the Flats took into account nearby residential areas and relationships to features of the site, street and adjacent buildings. The density and FSR guidelines remained the same for uses considered to be accessory and all other uses combined outside the outright approval uses defined by the I-3 district schedule (City of Vancouver, 2001). These elements of general intent, permitted uses and building regulations are key components of the I-3 district zoning.

4.3.2 The Great Northern Technology Park Zoning and Development By-law (CD-1: 402)

The Finning property, located in the south of False Creek Flats along Great Northern Way, is a second district that is specifically zoned for high-technology sector development in the form of an industrial technology park. Due to specific circumstances described in later sections, it was decided that this area would be zoned separately from the I-3 district schedule, but would remain an area exclusive to high-technology sector development (Appelbe, 2001). A comprehensive development district zoning designation was selected for application over the 26-acre site (See Appendix C). Comprehensive development zoning is defined by the City of Vancouver as:

**Comprehensive Development:** Means a development containing any number of buildings or uses or a combination of sites planned or developed in an integrated
In a similar fashion to the I-3 zoning district schedule, two terms were introduced to address live-work and high-technology industry use at the Finning site. They are defined as follows:

**Live-Work Use:** Means the use of premises for both a residential unit and non-residential use which is associated with and forms an integral part of the residential unit.

**High-Tech and Light Industrial Uses:** Means the research, development, assembly and manufacturing functions of high-technology industries including but not limited to, computers, software, telecommunications, bio-medical technologies, multimedia, film post-production, scientific and control instruments, and energy and environmental technologies, as well as these light industries: batteries manufacturing, brewing and distilling, electrical products or appliances manufacturing, paper products manufacturing, printing and publishing, public authority use, public utility, radio, communication station, storage warehouse and wholesaling-Class A. (City of Vancouver, 1999b)

Implementing comprehensive development zoning on smaller sites allows for regulations, guidelines and overall vision to be stated in greater detail especially in regards to permitted activities and total allowable floor area for each use.

Although the comprehensive development zoning for the *Great Northern Technology Park* has no stated general intent, the purpose of the CD-1 zoning is to dedicate a majority of the gross floor area (321,282 m$^2$) to high-technology uses and structure the appropriate development guidelines (City of Vancouver, 1999b). Permitted uses in the CD-1 zoning for the *Great Northern Technology Park* are oriented along the same lines as the I-3 zoning district schedule. A majority of the allotted space permitted pertains to uses limited to high-technology and light industrial uses, and offices for information technology firms. Services in the CD-1 zoning are limited to laboratory, photofinishing or photography laboratory, production or rehearsal studio and workshop uses (City of Vancouver, 1999b). General office uses, totaling 55,740 m$^2$ are permitted in the zoning. However, the offices of
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accountants, lawyers, notary publics as well as real estate, advertising and insurance agencies are not included in this use designation. These excluded office uses are limited to a very small floor area (5 574 m²). A unique use in the CD-1 (402) zoning is the inclusion of live-work uses (16 722 m²) and hotel services (9 290 m²). The uses were the result of the city's desire to better integrate this zoning area with surrounding residential districts. Finning also agreed to the inclusion of these uses as it informed broader city policy and adhered to principles of creating an urban, high-technology industrial park.

A document that is classified as 'Land Use and Development Policies and Guidelines', which is attached to the comprehensive development zoning (CD-1 (402)), is entitled "Great Northern Technology Park CD-1 Guidelines" (See Appendix C). This policy states guidelines pertaining to site conditions, design characteristics and building structure. The policy's main intent is stated as:

**Great Northern Technology Park CD-1 Guidelines:**

(a) Assist in the creation of an attractive, cohesive, high amenity, urban, high-tech industrial park.
(b) Integrate existing and future greenways, and pedestrian and bicycle connections
(c) Enhance the False Creek Flats' importance as an industrial area, particularly for new and future industries.
(d) Achieve development with a high quality of urban design and architecture. (City of Vancouver, 1999b).

The Great Northern Technology Park CD-1 Guidelines and the zoning by-law for the comprehensive development district compose the formal land use and regulatory mechanisms for the establishment of high-technology sector growth on the Finning site. Combined with the I-3 zoning designation, these two industrial districts represent a potential concentration of high-technology sector capabilities, resources and development in the Flats. The following section outlines the future plan for the remainder of False Creek Flats.
4.4 Future Planning for Remaining Portions of False Creek Flats

The Industrial Lands Strategy of 1995 determined that if development or changes were to occur in the zoning, function or type of activities in False Creek Flats, they would be done so with a comprehensive development strategy applied over the entire area. Although high-technology led development strategies for portions of the Flats have attracted much of the policy attention, it only accounts for about a third of the total site area. Future planning for remaining portions of False Creek Flats is necessary to provide a complete picture of development in the area.

The remaining area of land outside the I-3 and comprehensive district zonings totals approximately 175 acres. A majority of this land is zoned under the I-2 industrial district schedule established for the Flats in 1996 (See Figure 4.1) (City of Vancouver, 1996a). In a recent policy report to council, the False Creek Flats Urban Structure Plan was accepted in principal setting forth short and long term goals in regards to urban structure and site subdivision throughout the Flats (City of Vancouver, 2001). This policy report outlined future strategies and activities that potentially could occur throughout the entire site. The first planning strategy has been to develop an appropriate urban structure for False Creek Flats. Specifically, this pertains to the arrangement of sites, their subdivision for development and the layout of the road network. A planning priority for the Flats was to ensure that future development in the area resulted in an urban structure and road network that were functional to the site and appropriate to the surrounding area and transport networks (City of Vancouver, 2001). Also underlined in the policy report was the site subdivision of the Canadian National (CN) lands made possible by the rationalizing of their rail yards in property south of Terminal Avenue (Figure 4.3). The urban structure report also took into consideration the continued functioning of the rail and bus depot operations in
areas north of Terminal Avenue (City of Vancouver, 2001). Other activities that the city foresees locating in False Creek Flats are some city works and park board yards as well as land designated for fire training facilities. Parks and green spaces are also located within and outside high-technology zoned districts throughout the Flats. Finally, planning has looked at various greenways, pedestrian routes and mass transit options that may arise in the future (Figure 4.4) (City of Vancouver, 2001).

4.5 The False Creek Flats Planning Process: 1995 to Present

This segment of the thesis builds upon the previous descriptive section, which outlined the policy framework for False Creek Flats. Focus now turns to examining the events and discussion surrounding the planning process involved in the formation of the policy framework. Due to the research objective of planning for high-technology sector industries in urban contexts, emphasis is placed on the planning process surrounding the creation of the I-3 district schedule and the Great Northern Technology Park (CD-1: 402) zoning and development by-law. This section is structured around a timeline as development of the two high-technology zoning districts coincided with one another and is discussed together within the same planning process.

False Creek Flats has gone through significant shifts in policy direction often initiated by the City of Vancouver. This feature of planning process in the Flats has been prevalent since 1995. Therefore, the timeframe for examining planning process is from 1995 up until current happenings. Information surrounding the planning process on introducing high-technology industries as a development focus in False Creek Flats was obtained through technical documents, reports to city council, formalized policy statements, editorials and perspectives from planner(s) involved in the project.
The Industrial Lands Strategy of 1995 remains an important benchmark and established precedent for planning direction in False Creek Flats. Although the policy's recommendation was the preservation of city serving and related industry in the Flats, it commenced a series of discussions about the potential for permitting contemporary industrial uses, such as high-technology activities, in the area (City of Vancouver, 1995). Many city reports reference the Industrial Lands Strategy as a 'base policy' to situate discussion and emerging policy changes in the Flats. The approval of the False Creek Flats Preliminary Concept Plan (FCFPCP) and a related document discussing the need to update industrial zoning throughout the city were the first steps taken by the city to provide a planning vision for False Creek Flats in 1996 (City of Vancouver, 1996a; 1996b). Reasons raised by the planning department for updating industrial zoning was to have the city's existing industrial zones accommodate service oriented industries and increased office space capacity. Industrial use definitions for industries involved in high-technology activities such as software and electronics manufacturing were to be included in the updated industrial zoning. The rezoning to new I-2 zoning guidelines for most of the heavy and light industrial district designations in False Creek Flats was the result (City of Vancouver, 1996a; 1996b). The FCFPCP is a comprehensive policy setting forth broad directions about function, use and structure in the Flats. However, two important elements of the plan would prove to be critical to future planning processes. The first is that the concept plan subdivided False Creek Flats into seven sub-areas, three of which were identified with the potential to create specific industrial zoning. The second element of the FCFPCP was the consideration of permitting high-technology industry and related activity uses in the three mentioned sub-areas stretching across a continuous land area along the western and southern margins of the Flats. During this process, documents started stating the importance of high-amenity, low impact industrial activities such as those in the high-
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technology sector (City of Vancouver, 1996a). Areas in the western portion of the Flats, now zoned I-2, had been slated for high-amenity, low impact concentrated development. The Finning owned site occupying a majority of the property fronting Great Northern Way was in the process of working with the planning department to create a zoning for a high-amenity industrial park catering to high-technology firms. Public consultation in the formation of the concept plan for the Flats consisted of two public events that were designed to create a venue for discussion of issues and review presentation material on visions for the area. Meetings were also arranged between city staff and various public and private interests in False Creek Flats approximately six months before presentation of the FCFPCP (City of Vancouver, 1996a).

Finning's property located along Great Northern Way posed challenges and opportunities for planners and the landowner. It represented a large parcel of land in which both the city and developer representing the landowner wanted to see the site as a high-amenity industrial park catering primarily to high-technology activities. Early in the planning process, city and landowner representatives partnered together to achieve this task (Appelbe, 2001). Finning's 26-acre property was to be included in discussions around high-technology zoning in industrial districts, however, the main purpose was to develop specialized zoning designed to provide further opportunities for high-technology firms and other developments to occur (Appelbe, 2001; City of Vancouver, 1996a). A real estate consultant named Bob Laurie was hired to represent Finning's interests in False Creek Flats. It became evident that Laurie and Finning would have to plan the site in conjunction with the city's emerging broader land use issues as not doing so would risk total rejection of any plans thereafter. For the next eight years, Laurie and the City of Vancouver's planning...
department worked on this planning model (Appelbe, 2001). The Finning rezoning will be discussed in latter sections relating to its placement on the timeline.

By 1998, the False Creek Flats Concept Plan was two years old, and many new issues had come to the forefront in regards to identifying high-technology office as a permitted use in designated industrial zones throughout the Flats. A majority of the Flats was zoned for light industrial activities outlined in the I-2 district schedule. In a report to council entitled Accommodating High-Technology Uses in Industrial Areas, issues were raised to determine if the I-2 zoning could be amended to allow for more intensive high-technology office and production space development (City of Vancouver, 1998b). Under the I-2 district schedule, information technology office and general office uses are only permitted in conjunction with conventional industry and approved manufacturing uses. If any office use is to be built to the maximum of 1.0 FSR, two-thirds of the remaining floor area in the building must consist of conventional industry and manufacturing activities. Maximum density in the I-2 zoning is 3.0 FSR, but to reach this, the building must meet the aforementioned guidelines. This permitted density sparked concern as many developers felt it necessary to increase information technology office space density (City of Vancouver, 1998b). Another issue within the process was determining a new definition for high-technology use. In accommodating for high-technology activity in industrial areas, it was essential for a new high-technology use definition to be created, which did not require the need for on-site manufacturing or distribution facilities. Any high-technology oriented zoning would include this new use definition (City of Vancouver, 1998b).

Discussion and planning for high-technology uses in industrial areas was motivated by fast growth rates that the technology sector exhibited at the time. This was coupled with
concerns that the City of Vancouver should be very proactive in supporting the development of adequate office and production space for this sector. Failure to do so would result in a loss of potential high-technology employment and office space to other municipalities that did cater to the specific needs of the sector (City of Vancouver, 1998b). Requirements to address broader citywide policies placed pressure on the planning process as well. Consideration was given throughout the process to overarching citywide policies such as the ILS (1995), CityPlan economic initiatives and Vancouver’s Transportation Plan. The ILS was designed to ensure that a sufficient supply of city serving industrial land existed. Goals of a diversified and healthy local economy were placed under the influence of CityPlan. Finally, the city had a long-standing policy encouraging the location of dense commercial areas close too or in conjunction with well-served public transit to minimize car commuting (City of Vancouver, 1998b). Council, informed by the Vancouver Economic Development Commission (VEDC), was also motivated by the overall purpose of fulfilling economic development interests of the city. High-technology strategies for the Flats were recommended and viewed as means of promoting economic development in Vancouver (Naylor, 2002). At this point in the planning process it was recommended to council that planning staff should create a new industrial district schedule zoning, rather than try to amend the uses and permitted density in the I-2 district schedule. The new high-technology industrial district zoning designated I-3 would then be applied as a city initiated rezoning to areas within False Creek Flats. The goal of this new district schedule was to create a definition for high-technology use that did not require on-site manufacturing or distribution facilities, allow these uses greater density and take into account areas well served by transit (City of Vancouver, 1998b).
Before proceeding with the formation of the I-3 district schedule, a unique initiative by the city, developers and consultants was undertaken to conduct field research on high-technology sector development and planning in urban environments. Research was conducted to provide context and inform the decisions that were going to be made. A discussion paper titled "High-Tech Industry in the Urban Context" was the culmination of this planning research (City of Vancouver, 1998a). In April of 1998, planners from the city’s Central Area Planning Division along with Finning’s representative in Bob Laurie made several trips examining various high-technology oriented office and production space developments along the west coast of America. Consultants and architects representing various interests were also involved. The group visited high-technology developments in urban and suburban contexts. They examined differing scales of development varying from single buildings built for one high-technology firm to a complex of buildings to serve as a high-technology sector agglomeration (City of Vancouver, 1998a). This initiative and resulting document contributed to the process of creating the appropriate policy framework for high-technology uses in False Creek Flats.

Some lessons can be distilled through the field research conducted by planners and developers in 1998. Planners and developers knew that high-technology sector concentration in False Creek Flats posed unique challenges and opportunities. They realized that if high-technology office and production space was to be developed in portions of the Flats, other contributing elements, activities and amenities must also be developed in conjunction with high-technology spaces. The urban context of the site supported the notion of combining high-technology industrial uses with mixed-use development patterns. A key term mentioned in the discussion paper was a ‘High Amenity, Urban, High-technology Industrial Park’ (HAUHIP) (City of Vancouver, 1998a). This was representative of a vision
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guiding the land use and policy framework for the Flats. Elements deemed essential by the planning group for this development strategy were appropriate land use designation, density requirements, transit service, access to downtown amenities, housing and access to on-site services (City of Vancouver, 1998a; Appelbe, 2001). Conducting field research with various stakeholders involved proved quite successful and contributed significantly to the planning process. Although many of the elements identified in the discussion paper were already known, it served to inform any decisions that would be made in regards to the Flats. The next step in the planning process involved the formation and proposal of the two high-technology industrial district zonings.

Since 1998, planning staff had set out to create a new I-3 industrial district schedule. The discussion paper, *High-Tech Industry in the Urban Context* (City of Vancouver, 1998a) provided information to the eventual formation of the I-3 district schedule for the Flats and CD-1 zoning designation for Finning's property. In a 1999 report to council, the planning department proposed a new I-3 district schedule. Reasoning, fundamental features and details about the new zoning were contained in the report entitled, *Proposed High-Technology Zone (I-3)* (City of Vancouver, 1999c). Under council's instruction, city staff needed to create a new definition for high-technology uses and permit them to a density of 3.0 FSR, while also identifying areas well served by transit to implement the I-3 zoning (City of Vancouver, 1999c). A crucial component was to create a use definition that took into account high-technology firm operations, which did not require manufacturing or distribution facilities. The 1999 report to council defined high-technology activity into four groups:

- Information Technology
- Biotechnology
- High-technology manufacturing
- New Media (City of Vancouver, 1999c).
Information technology was the new office use proposed by planning. Information technology office and other defined high-technology uses were permitted to densities of 3.0 FSR. An amendment to the I-3 zoning in 2001 limited the outright approval of these uses to 1.0 FSR. However, maximum densities of 3.0 FSR for the prior mentioned uses could be attained through Vancouver’s development permit board.

A vision for the I-3 district schedule was to ensure that what the city termed as a ‘high-technology atmosphere’ existed with respects to the new zoning. Along with permitting the appropriate uses for the zoning, the city identified the role of supporting high-technology services, amenities and design guidelines in the creation of a viable environment for high-technology development. In theory, the result could be the formation of a high-technology designed zoning that provided an atmosphere conducive to the clustering of sector related industries (City of Vancouver, 1999c). Part of the process was also identifying areas well served by transit to apply the I-3 zoning in order to adhere to prior policy guidelines of concentrating commercial development and employment with transit service. Impacts of implementing a specialized high-technology zoning in the Flats to other commercial areas in downtown and Broadway districts as well as consequences to city serving industry were taken into account during the policy formation process. The report concluded that the high-technology zoning would not detract from downtown nor surrounding commercial districts as the I-3 zoning designation in False Creek Flats would only add flexibility in choice of location, building layout and contribute to the diversity of Vancouver’s emerging high-technology sector (City of Vancouver, 1999c). Impact to conventional industry on land that could be zoned for high-technology use was less positive. The report stated that in all likelihood, “industrial activity will not be able to compete with the information technology sector for space within the I-3 areas” (City of Vancouver, 1999c,
However, it was recommended that enough land zoned for light and heavy industry existed elsewhere in the city for these activities to locate in. Therefore, the Proposed High-technology Zone (I-3) report recommended that a city initiated rezoning for approximately 125 acres to an I-3 district zoning along western and southern portions of False Creek Flats was the best implementation strategy. This allowed for Finning's site to be rezoned to a comprehensive development schedule if so desired (City of Vancouver, 1999c). The development process for the Great Northern Technology Park zoning is the focus of the following section.

The report to council on the Proposed High-Technology Zone (I-3) recommended 125 acres within False Creek Flats to be rezoned to this new district schedule. This total land area included the 26 acre Finning site. However, intentions of the Finning representative in Laurie, and city staff interests were to structure a separate policy framework for the creation of a high amenity, high-technology oriented business park with a distinctive urban character (Appelbe, 2001). In earlier stages of the process, the Finning site had been considered as a potential comprehensive development district because of the homogenous landownership. Evidence of this comes from the FCFPCP, where the site is first discussed as an area of reuse for low impact and service industries, possibly attracting high-technology firms to an industrial park atmosphere (City of Vancouver, 1996a). Laurie needed to provide evidence towards why it was appropriate for the Finning site to receive a CD-1 zoning. In doing so, Laurie worked closely with city staff throughout the entire process to take into account broader issues and discussion about high-technology land use designation in the Flats. Laurie turned to the joint discussion paper, High-Tech Industry in the Urban Context, referencing information and development principles to form the basic structure of what he as well as city staff, developers and architects thought was necessary
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in implementing land use control mechanisms over the site. Conclusions about a fairly dense high-technology oriented industrial park with taller buildings, housing in proximate areas, inclusion of numerous amenities, a supply of adequate power and fiber optic infrastructure was supported by Laurie and city staff (Appelbe, 2001). The Great Northern Technology Park, as it had been called, was classified as a high amenity, urban, high-technology industrial park (HAUHIP). The remainder of the process involved Laurie and city staff promoting the inclusion of conventional office, retail, service, hotel and live-work uses to be permitted in the comprehensive development district. The end result was a comprehensive development district zoning that incorporated aspects of a well designed technology park with increased density, urban appeal and residential compatibility (Appelbe, 2001; City of Vancouver, 1999b).

By the end of 1999, two rezonings had occurred with the approval of the I-3 district schedule and Great Northern Technology Park comprehensive development district (CD-1(402)). This policy framework for the Flats culminated in the city initiated rezoning of 125 acres exclusively oriented to high-technology uses and information technology office functions. An interesting note is that the current I-3 and CD-1 zonings stretch across the same sub-areas in western and southern segments previously identified in the Flats concept plan of 1996. Decisions about location of the I-3 and CD-1 rezoning can be attributed to the requirements of locating high-density commercial areas in close proximity to transit service (City of Vancouver, 1996a; 1999c).

Establishing the land use policy framework for the Flats allowed for further planning to proceed. In 2001, the False Creek Flats Urban Structure Plan (See Figure 4.4)(City of Vancouver, 2001) was approved in principal. Details of this plan are stated earlier in the
chapter. However, it is important to note that although this represented a very comprehensive plan, it lacked many of the details that would be necessary to assist in guiding developers and subsequent development permits according to city staff (City of Vancouver, 2001). The next step in recent planning processes was providing more details about the design guidelines for development in the high-technology oriented zones. City staff recommended the creation of 1-3 District Guidelines, similar to the design guidelines that were attached to the Great Northern Technology Park. These gave consideration to issues of streetscape, building form, height regulations, transportation and architectural components. The intent of the '1-3 District Guidelines' is to ensure the formation of "attractive, cohesive, urban developments for high-technology industry that display a high-quality of urban design and architectural expression; integrate existing and future greenways, and pedestrian and bicycle connections; and improve and enhance the quality of the public realm in False Creek Flats" (City of Vancouver, 2002b, p.01). Council adopted the 1-3 District Guidelines in 2002 (See Appendix B). This concludes the section on planning process issues in False Creek Flats over the past eight years. The final section in this chapter describes conflicting perspectives raised about high-technology visions and resulting development in the Flats.

4.6 Conflict and Differing Visions for False Creek Flats

Any process involving the rezoning or initiative of attracting new uses to an established area is bound to bring about differing perspectives and interpretations of visions for the area. This was no different in False Creek Flats. Differences in opinion and perspective among city staff did occur, however, this thesis concentrates analysis on one individuals concerns. This is because the particular issues addressed by the individual were quite comprehensive and covered many of the differences in opinion that city staff had
encountered. It is the intent of this section to describe the conflicts, thus situating them for further analysis.

Ted Droettboom, former General Manager of Community Services in Vancouver, made his concerns known when the proposed I-3 district schedule was being referred to council. His comments centered on the creation of high-technology oriented uses and information technology office functions being permitted in False Creek Flats to higher densities (City of Vancouver, 1999c). One of Droettboom’s arguments against high-technology oriented zoning in the Flats was the risk of allowing space for back-office activities serving downtown operations to form. He stated that lower rents in the Flats made it attractive for the location of conventional rather than information technology offices (City of Vancouver, 1999c). Defining high-technology and information technology office uses also posed problems to Droettboom. His concerns were that the real estate industry would not be able to discern or delineate the differences between information technology and general office functions outlined in policy. He argued that this would result in abuse of land use policy, leading to problems of enforcement to maintain activities so that they conform to creating an ‘atmosphere’ for the high-technology sector (City of Vancouver, 1999c; Appelbe, 2001; Smith, 2002).

Droettboom raised issues over initiatives in False Creek Flats concerning the primacy of Vancouver’s CBD and broader conflicts of policy at the regional scale. At the city scale, Droettboom mentioned that False Creek Flats maximum office potential, whether it be information technology offices or not, was two-thirds the equivalent of existing office space in downtown Vancouver. This would challenge the primacy of the downtown core’s function, along with any other established commercial center throughout the city (City of
Vancouver, 1999c; Appelbe, 2001). At the regional scale, Droettboom suggested that land use initiatives in the Flats were in complete conflict with the GVRD strategy of controlling and concentrating commercial growth in the established town centers throughout the region. He argued that the Flats zoning would centralize a large commercial supply of office space, which would be detrimental to the growth of town centers. Droettboom stated that high-technology development initiatives should be oriented to the downtown core and regional town centers. A final criticism raised by Droettboom was that the pressure on transportation infrastructure and adjacent neighbourhoods would be too costly and demanding on the existing urban structure of the area (City of Vancouver, 1999c; Appelbe, 2001; Smith, 2002).

The purpose of this section was to describe conflicts and differing perspectives in regards to the formation of the high-technology policy framework for the Flats. This approach was taken to situate and determine planning responses before, during and after the formation of the policy framework for False Creek Flats. In the following chapter, these conflicts of perspective and imperatives to planning are examined in greater detail.

4.7 Conclusion

Chapter 4 provided the policy framework and planning process information on the thesis’ case study of high-technology sector initiatives in False Creek Flats. Before proceeding with the policy framework description, it was necessary to revisit the original research question and underline the policy analysis perspective of this thesis. This also presented an opportunity to address the first portion of the primary research question in regards to classifying development in False Creek Flats along the induced versus spontaneous spectrum. High-technology initiatives and the planning mechanisms that
accompanied them were examined and considered to be characteristic of induced rather than spontaneous development, thereby locating the case study on the induced side of the spectrum. From this point, focus turned to the policy framework for the Flats. A description of the I-3 and CD-1 (402) zoning districts were stated next, which make up the land use mechanisms for inducing and providing an attractive environment for high-technology industry in Vancouver. Outlining a timeline of major events and initiatives for the Flats that was accompanied by an analysis of planning process was the objective in the following sections. This allowed for some conflicts in opinion to be underlined with respects to visions about the Flats future. This chapter took a descriptive perspective in describing elements of the policy framework for False Creek Flats. Chapter 5 takes an analytical perspective in examining the implementation of policy and states planning imperatives that arose from the False Creek Flats case study.
Figure 4.1: False Creek Flats I-3 and CD-1 (402) Zoning Boundaries and Location.

Source: City of Vancouver, 2002a (Planning Department)
Figure 4.2: The Former Finning Site (555 Great Northern Way).

Figure 4.3: Rationalization and Preparation for Subdivision of the Former CN Rail Yards.
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Figure 4.4: False Creek Flats Urban Structure Plan: Phasing and Long-Range Goals.

EXISTING STRUCTURE
- existing rail yards present formidable barrier to north-south movement
- Terminal Ave. is only internal east-west through street
- there are no internal north-south through streets
- great variety in size and configuration of land parcels, many have poor access

PHASING

PHASE 1: Current Opportunities
1. Finning CD-1 (high-tech business park)
2. Station St. bio-tech development
3. CN subdivision - Part 1 (Terminal Ave. frontage)
4. Schroeder site (Tech-park.com)

(Greenways established north of CN Yard and through Schroeder site)

PHASE 2: Mid-Range Opportunities
5. BNSF Yard closes and is subdivided
6. CN subdivision - Part 2 (Cotrell St. frontage)
7. City Works Yard opens
8. 401-455 Industrial Ave. and adjacent park are developed
9. City-owned Main-Station properties reconfigured

(Industrial Ave. realigned to improve intersection at Main St.)

Source: City of Vancouver, 2001 (Planning Department, Central Area Division)
PHASE 3: Long-Range Opportunities

10. CN Yard closes and is subdivided
11. area between 1st and Industrial is reconfigured
12. area between Cotrell and Glen is reconfigured
13. streets extended north to Evans Ave.

Source: City of Vancouver, 2001 (Planning Department, Central Area Division)
Chapter 5

Implementing the False Creek Flats Policy Framework: Exploring Planning Imperatives

5.0 Introduction

Chapter 5 examines the formation and implementation of the False Creek Flats policy framework. This chapter addresses the final inquiry posed in the primary research question, which is to determine the planning imperatives that arise or are imposed by implementing high-technology led initiatives in False Creek Flats.

As the policy framework was outlined in Chapter 4, it is necessary to state the components of the Flats policy framework as it is frequently referenced throughout this chapter. Formal policies within the framework consist of the I-3 district zoning schedule accompanied by the district guidelines and the comprehensive development district zoning and guidelines (CD-1 (402)) for the Great Northern Technology Park (Refer to Appendix B; C). Another formal policy is the False Creek Flats Urban Structure Plan. The composition of the policy framework also consists of many informal opinions and visions that have been established throughout the formation of formal policies, which merits discussion in this chapter. Providing context prior to exploring planning responses in False Creek Flats is discussed in the first two sections of this chapter. The first section addresses policy framework implementation issues and differences in opinion from the perspective of the City of Vancouver. Reaction to the Flats policy framework by high-technology industry, market and developer interest is covered in the second section. This allows for many of the current development issues and problems to be considered while a contemporary snapshot of high-technology firms in the Flats can be described. The third and final section explores
5.1 Evaluating the False Creek Flats Policy Framework

This section examines differences in vision about the Flats future and conflicts over what the impact will be for implementing the described policy framework. An internal perspective is taken for a majority of this section, as the planning and political institutions within the City of Vancouver is where many of these differences in opinion and vision manifested themselves.

5.1.1 Opinion, Policy, Differences and Response

One of the first conflicts involved the importance of preserving city-serving industrial land underlined in the Industrial Lands Strategy (City of Vancouver, 1995). As False Creek Flats had been retained for mainly city serving industry, debates followed about the changing nature of industry and accommodating these changes through rezoning thus allowing new high-technology industrial uses into the area. Chris DeMarco, a senior planner during the policy framework formation for False Creek Flats, developed the Industrial Lands Strategy and helped with the I-3 zoning district schedule referral report to council (City of Vancouver, 1995; 1999c). Her position on the future of high-technology led development in the Flats gives evidence to the internal differences of opinion among city staff that did occur throughout the planning process. Even though Demarco helped in the development of policy for high-technology activities, she believed firmly in her previous findings of protecting city-serving industrial land in the Flats. The functioning of these sites was crucial in terms of employment and provision of industrial services according to DeMarco. Her opinion was that the inclusion of high-technology activities as a permitted
industrial use would push existing city-serving industry out of established districts due to rising land rents.

The planning response was to state what had been reiterated throughout the process after 1995. High-technology activities and information technology office functions were to be considered an emerging industrial sector with increasing importance to the city. Furthermore, information technology offices and high-technology production activities were only permitted in selected areas within False Creek Flats. According to the numerous reports to council, the updated industrial zoning, known as I-2, allowed for a sufficient supply of space to service conventional industries adequately (City of Vancouver, 1996b; 1999c). With this response, policy allowance for high-technology zoned districts commenced.

Revisiting Ted Droettboom’s critique on implementing the False Creek Flats policy framework allows this thesis to review planning responses brought about by these concerns. Droettboom made three arguments against the case of high-technology intensive development in the Flats. The first was that the scale of intensive commercial activity growth, specifically in high-technology and information technology sectors, would challenge the primacy of Vancouver’s downtown and other commercial centers. Secondly, information technology offices and high-technology production space would not be recognized as a distinct use by the market leading to problems of conventional offices locating in the area contrary to zoning district controls. Droettboom’s final critique related to the False Creek Flats high-technology led initiative to be in direct conflict with the GVRD strategy of concentrating extensive commercial activity, employment and transportation
The rezoning of industrial land in False Creek Flats according to I-3 and CD-1 district schedule guidelines proceeded despite Droettboom’s concerns. However, responses from planners to some of these concerns were included in a memorandum to council, which provided information to address some of the inquiries that council had during the referral stages of the *Proposed I-3 High-technology Zone* report to council (City of Vancouver, 1999d). In terms of addressing Droettboom’s first concern over challenging the primacy of downtown and other commercial centers, a monitoring system was recommended to gather information relevant to analyzing impacts on established commercial centers. Monitoring would consist of looking at:

- A) Amount of high-technology space built by type of use, absorption, and vacancy rates;
- B) Amount of new office space locating in the downtown and Central Broadway and absorption/vacancy rates; and
- C) Interviews of companies to determine reasons for locating in I-3. (City of Vancouver, 1999d, p.23)

A similar type of monitoring system was established to look at the implementation impacts of high-technology initiatives (I-3) in the Flats. This was done to address concerns about specialized zoning providing opportunities to high-technology firms, while pushing out conventional industries because of rising land values and rent (City of Vancouver, 1999d). Planning recommended that the following be monitored:

- A) Land price/rent of lands zoned I-3 compared with comparable properties in I-2 areas;
- B) Densities achieved in I-3 compared to I-2; and
- C) Types of firms locating in I-3 compared to I-2. (City of Vancouver, 1999d, p.24).
Monitoring program responses were designed to gather data on future impacts of land designated for information technology office use and determine if any detrimental consequences to existing commercial centers and conventional industrial districts could be identified. If so, planning would bring these concerns to council to determine an appropriate course of action (City of Vancouver, 1999d). Planners also argued that the intent of high-technology oriented zoning was not to compete with established commercial districts, but to add diversity to the city’s economic and industrial landscape. In one planner's opinion working on the False Creek Flats area, the I-3 and CD-1 rezoning offered more choice to high-technology firms who have grown out of existing offices and required flexible and larger spaces. Land use mechanisms implemented in the Flats could accommodate high-technology firm requirements of larger, hybrid building functions with high-technology activity and information technology office uses permitted to certain densities (City of Vancouver, 1999c; Naylor, 2002).

Droettboom's second concern revolved around inabilities of the property market to distinguish information technology office uses from conventional industrial and commercial functions. Abuse and misinterpretation of the use designations would result in the creation of back-office districts serving downtown or other commercial areas (City of Vancouver, 1999c). The opinion of planners was markedly different. In an interview with a senior planner at Vancouver’s Central Area Division, the Flats policy framework was believed to be sufficient to ensure that permitted and appropriate uses would locate in the area (Naylor, 2002). The planner cited potential consequences of locating a non-permitted use in the high-technology district. If a firm were large enough to require back-office functions, locating in a legitimate and legal office space would be a priority. As use functions for industry and commercial activities are determined and regulated through business licenses,
the legitimacy of the firm as well as the back office operation would be placed in jeopardy. It was the opinion of the planner that fulfilling legal requirements of the zoning would be placed first by the firm before they would knowingly locate illegally and against zoning regulations outlined in the False Creek Flats policy Framework (Naylor, 2002). In the 1999 Proposed High-Technology Zone (I-3) referral report, planners were not completely benign to the possible detrimental impact on other commercial centers as well as the issue of office use enforcement. They stressed that as buildings in high-technology designated zoning will contain office type structures, city staff must ensure that enforcement of the use of these offices be for information technology and high-technology focused firms (City of Vancouver, 1999c).

The final issue raised in Droettboom’s rejection of the proposed I-3 zoning district was that it conflicted with goals of creating employment concentrations in regional town centers as stated in the GVRD Livable Region Strategic Plan (LRSP). Ken Cameron, Manager of Policy and Planning for the GVRD, supported this perspective. His main concern was that commercial space and resulting employment concentration in the Flats from high-technology sector development would prove detrimental to regional town center employment and commercial growth in the long run. Cameron believed that intensive high-technology commercial and industrial development in the Flats would be considered an extension of Vancouver’s downtown core (City of Vancouver, 1999d). Although planning did not have a direct response, planners pointed to the process for answers. During the policy framework formation process for False Creek Flats, concentrating information technology offices and high-technology activities around well serviced transit areas was a central premise upheld by policy, planners and council. The resulting I-3 and CD-1 zoning being applied to the western and southern portions of False Creek Flats, near the Main
Street SkyTrain station, did satisfy the city’s and region’s goal of associating rapid transit with commercial centers. It was also the opinion of planners involved in the Flats initiative that many other municipalities in the GVRD had not adhered to the principles of concentrating commercial activity, employment and transit service in regional town centers. This is evident in the numerous commercial oriented business parks in surrounding municipalities that do not focus growth in regional town centers and are not well serviced by transit (Naylor, 2002). The City of Vancouver sided with its vision of high-technology led development for False Creek Flats and the rezoning went forth. A narrative on the role of politics and policy in planning for the Flats is stated in the following section.

5.1.2 Politics, Policy and PUSH

Many of the mentioned differences in opinion about the impacts of implementing a policy framework that allows for the creation of a significant high-technology commercial and industrial district remains very political in nature. Any initiative imposing major ramifications for city development and having influence over a large-scale area is bound to involve political pressure. This is no different in the False Creek Flats case. As the policy framework and new zoning district schedules came closer to approval by council, increasing divergences of opinion arose among city staff, council and regional bodies of governance. This can be attributed to politics influence in guiding high-technology development visions for the Flats. In an editorial written by Charlie Smith (2002), Vancouver Councilor Jennifer Clarke was identified as one of the major supporters of changing policy in the Flats to promote a high-technology led development strategy (Smith, 2002). Linked to this political push were the desires by council and Vancouver Economic Development Commission interests to promote economic growth. High-technology led visions for the Flats were
viewed as an economic development opportunity and was supported by council (Naylor, 2002).

The impending political 'push' from council would have ramifications to planning in the Flats. Planners and the process that ensued were required to balance between land use and industrial policies already in existence, while at the same time forming policy relevant to recommending changes of direction for an area knowing what they were proposing might instigate debate over whether new proposals would be contrary to existing policy. This was the case throughout the False Creek Flats process in regards to protecting city serving industrial land and activities stated in the ILS (City of Vancouver, 1995). Even with the discussion papers on updating the City of Vancouver's industrial zoning in 1996, implementing high-technology uses in the Flats would pose significant competition to existing city serving industrial land. However, planning went through and proposed a new high-technology zoning for over one third of False Creek Flats total land area, which was later approved by council. The ILS was always identified as an important policy whose principles should be taken into account. Yet, at the end of the process, central elements of the ILS were subverted with the creation of high-technology zoning districts for the Flats. The following section underscores reaction from the market, developers and high-technology firms to the aforementioned Flats initiatives.

5.2 High-Technology Market Reaction to the False Creek Flats Policy Framework

The previous section examined the policy framework from an internal perspective with respects to the dynamics of Vancouver's council, planning department and related regional governing institutions. This examination of market and high-technology sector reaction takes an external perspective. The objective will be to formulate the reactions of
the market in response to the policy framework and provide information on current high-technology sector composition in False Creek Flats. It is of central importance to gauge market reaction to a policy initiative that is reliant on private interests and market conditions as is the case in the Flats.

5.2.1 Examining Market Interest and Decline

Since the policy framework implementation in the Flats, developer and market interest has declined. Some interest was shown by high-technology firms located in the Lower Mainland (PMC Sierra) to purchase land and develop their facilities within the Flats (Appelbe, 2001). However, not many of these initial interests came to fruition. The supply of land created through high-technology zoning in the Flats must be taken into account by markets, developers and industry. If the I-3 and Finning zoning districts, totaling 125 acres, were built to maximum density, the estimated gross floor area would be 16 million square feet. As a comparative, office space totals for the Downtown and Central Broadway commercial districts total approximately 30 million square feet (City of Vancouver, 1999c; 1999d). Market and developer reaction to the high-technology policy framework in the Flats must take into account absorption rates by high-technology firms. The City of Vancouver has estimated that according to current growth rates, demand from the high-technology sector could range from 100 000 to 200 000 square feet of space annually (City of Vancouver, 1999c).

Two types of market and developer reaction to the policy framework in the Flats can be generalized. The first is where a high-technology firm chooses to purchase a parcel of rezoned land in the Flats and constructs its own production space. The second type of market reaction involves a developer, whose interests would be to attract high-technology
tenants to lease space within the project. Strategies for project formation by a developer are similar to the approach taken by individual firms. Developers would acquire a parcel of land within the Flats and proceed with plans for the site. Projects under the control of a developer can take numerous forms. Some are oriented around the construction of one building, while other projects may involve the construction of an entire complex. In the False Creek Flats case, developers need to attract high-technology firms permitted in the zoning. Information on the potential demand for information technology office and high-technology production facilities and the supply of relevant sector firms willing to locate in these spaces becomes crucial.

This thesis proposes that the reactions by the market stated above represent active reactions that are influenced by the policy framework for False Creek Flats. Policy guidelines and planning controls over the rezoned portion of the Flats have been designed to develop a specific sector in an area, while at the same time creating an attractive overall environment for high-technology industry. Policy and land use mechanisms are oriented to work together with the market.

Market reaction has arisen that is not related to the False Creek Flats policy framework. This type of market reaction can be considered passive in nature as no direct link can be established between occurrences in the market and policy formation in the Flats. The decline in 2000 of many high-technology sector markets was not controlled or influenced by policy formation and the creation of high-technology zoning in the Flats. Instead it reflected broader market trends. Market decline had a significant impact on areas where high-technology zoning had been applied. High-technology firms that had slated to locate firm operations in I-3 or CD-1 designated sites in the Flats abandoned plans because
of market decline. This was the case with the high-technology firm 360 Networks, which filed for bankruptcy protection, thus precluding any plans of purchasing land from Finning for the location of their operations (Smith, 2002).

This section has posed issues in regard to how planning and policy formation should be oriented to maximize market interest to induce high-technology sector development in False Creek Flats. Achieving this objective while at the same time designing policy and planning processes to minimize the impact of market downturns that may change the original intent of policy goals for False Creek Flats is a challenging task for planning. These issues are dealt with in the final section on examining imperatives to planning in the Flats. The section to follow offers a summary of current market reactions and the location of high-technology firms to date in False Creek Flats.

5.2.2 Current High-Technology Tenants and Development Issues in the Flats

This section describes high-technology tenants and related development issues in False Creek Flats. Since the policy frameworks approval in 1999, a small handful of high-technology firms have either located on land they have purchased or become tenants in information technology buildings (Figure 5.1). The small number of high-technology firms in the area can in part be attributed to industry market downturns in 2000 (Smith, 2002). This carried over into the development side of constructing high-technology oriented offices as developers realized a significant drop in demand from high-technology sector firms.

One high-technology firm that has chosen to locate in the southeast corner of the I-3 zoned land in False Creek Flats is Quadra Logic Technologies (QLT) (Figure 5.2). QLT represents the largest high-technology industry operating in the area (Appelbe, 2001). Due
to the company’s size and their bio-technology industry requirements for laboratories and information technology oriented offices, the firm decided that the best location strategy would be to purchase property and build their operations on site rather than lease office space. As QLT was the first high-technology firm to locate in the Flats, space was and remains to be plentiful. Although the market downturn did present setbacks for QLT, its decision to locate in the Flats may pay off in the future (Smith, 2002). The I-3 zoning has allowed QLT to construct the appropriate building type and production space needed for their industry. The ample space has also provided expansion opportunities as QLT recently purchased property adjacent to its current location (Figure 5.3)(Naylor, 2002).

Radical Entertainment was the second high-technology firm to locate in the Flats after QLT (Appelbe, 2001). The company occupies multiple storeys totaling 50,000 sq/ft. in an information technology oriented office building along Terminal Avenue that is in the I-3 zoning district (Figure 5.4)(Appelbe, 2002; Vikhman, 2002). Radical Entertainment selected a different location strategy by leasing office space rather than buying property and proceeding with construction as QLT had done. Discovery Parks Incorporated (DPI) is also involved in the construction of a project in False Creek Flats, however the land that it holds is part of an I-2 zoning district (Figure 5.5). The company’s function is to develop profitable real estate to supply space for growing high-technology businesses, which are often firms with an intensive research and development agenda that require proximity to post-secondary education and research institutions (DPI, 2002). The first phase of the DPI project in the Flats has just finished completion. An anchor tenant in Angiotech Pharmaceuticals will lease a large amount of space in phase one of what is being called by DPI as the False Creek Research Park. The total floor area in the first phase of the False Creek Research Park contains 78,000 sq/ft. of space specifically designed to meet the
needs of bio-technology firms \textit{(DPI, 2002)}. \textit{DPI} is a unique company involved in very specialized real estate development. Yet, \textit{DPI}'s priority is to lease high-technology oriented space to prospective tenants that are deemed appropriate for the building. The cases of \textit{QLT}, \textit{Radical Entertainment} and \textit{DPI} characterize different approaches taken in choosing a method and strategy for locating high-technology operations in the Flats.

There are other current development issues that are accompanying the slow movement of high-technology firms into the area. The first development issue is brought forth by one of the most ambitious projects to date since the approval of the high-technology policy framework for the Flats. This is Schroeder Properties \textit{Tech-Park.com} project, which plans to locate on an 18-acre site in the northwest corner of False Creek Flats. The project is a complex containing 13 buildings with a total of 2.5 million sq/ft. of information technology office and high-technology production space (Figure 5.6; 5.7; 5.8)(Appelbe, 2002). Development problems with respect to \textit{Tech-Park.com} relate to the market decline in 2000, as the developer (Schroeder Properties) faced a lack of interest from prospective anchor tenants. Furthermore, Schroeder had argued that the development cost levy of 3 dollars for every square foot of development, designed to pay for required city infrastructure and amenities was too costly for the already cash strapped project (Smith, 2002; Stuek, 2001). Despite these concerns, Schroeder Properties seem determined to go forth with plans for \textit{Tech-Park.com} as they are in the development approval process which would allow for phase one of the project to commence.

A recent development issue has arisen in regards to the Finning site. In November 2001, Finning donated an 18.6-acre parcel of its 26-acre site to a multi-university consortium consisting of the University of British Columbia, Simon Fraser University, Emily
Carr Institute of Art and Design and British Columbia Institute of Technology. The multi-university consortium will control a majority of the development. It is predicted that the universities will retain 1 million sq/ft. for use by the institutes, while allowing for 1.6 million sq/ft. in private development (Ward, 2001; Smith, 2002). Although Finning was actively involved in the marketing of the site to a major buyer or developer, Finning had no intention of being involved as a developer. Laurie, Finning's real estate consultant, stated that the market downturn in the high-tech sector motivated the decision to donate, but also pointed out that Finning still holds interests in approximately 7-acres of land (Ward, 2001). The multi-university consortium now has the responsibility of attracting market investment and high-technology firms. A central question that remains is whether the multi-university consortium will be featured as an attraction or inducement to stimulate market interest. The previous two sections of this chapter on implementing the False Creek Flats policy framework and examining market reaction provides context into the following section on challenges and implications to planning.

5.3 Imperatives to the False Creek Flats Case Study: Forming New Planning Responses

A primary objective of this thesis is to examine planning responses and mechanisms utilized to develop and implement the high-technology led strategy in False Creek Flats. Imperatives to planning have arisen in regard to the unique land use policy initiatives carried out in the Flats. This section presents an analysis of the planning responses that this thesis has identified. Tom Hutton describes the direction of the Flats initiatives as a ‘frontier-planning’ area district (Hutton, 2002). The ‘frontier’ characterization of the False Creek Flats case is appropriate in describing what high-technology initiatives intend to do and how they were developed to achieve this task?
5.3.1 Proactive Planning: A Guiding Principal

Evidence taken from the policy framework, information regarding the planning process and opinions from planners point to False Creek Flats high-technology initiatives as being guided by proactive planning fundamentals (Naylor, 2002). A reason for the proactive stance employed by planning is because of the significant control planning could exert over land use and overall development forms in the Flats. Instead of planning for broad categories of development such as housing, green space or industry, initiatives applied in the Flats concentrate on attempting, not only to attract a specific industrial sector, but also position district zoning to contribute to the creation of an image. Image associated with the creation of a high-technology district was identified by the city as an important factor for the location of information technology firms. The False Creek Flats policy framework can be viewed as a conveyance of this high-technology image and atmosphere. Therefore, planning required assertive policy formation to proceed ensuring that False Creek Flats designation as a high-technology industrial district was implemented with strictly permitted uses, regulations and design guidelines. The proactive stance allowed the City of Vancouver planning department to impose the appropriate policy and control mechanisms associated with the high-technology development strategy for False Creek Flats.

Issues have come about in regard to the type of development the planning department wanted to proceed in the area. High-technology sector led development remains a focus for portions of the Flats. This results in an inherent attachment and dependency that the policy framework would have to market conditions. Many other city-based projects and initiatives are effected by market conditions. However, this thesis argues that commercial and industrial sectors exhibiting high growth rates, such as the case in high-technology, are more susceptible to market fluctuations resulting in increasingly
pronounced impacts to development. The correlation between policy formation and market conditions is evident in the downturn of high-technology sectors in 2000 and the low demand for information technology oriented office and high-technology production space in False Creek Flats. Market based development and policy designed to induce high-technology sector investment left the entire initiative susceptible to market fluctuations. As planning took the position of attempting to induce high-technology sector development, implications concerning the possibility of market dependence presiding over all objectives in the Flats policy framework was a risk that the city accepted.

Political motivations behind the False Creek Flats initiative must be taken into account. It was stated earlier that council members in the City of Vancouver were pushing for the development of high-technology sectors in the Flats. This carried into planning where the department was required to take a proactive policy formation and procedural stance to fulfill the aforementioned political motivations of addressing economic opportunity and growth in the city through land use planning. This underlines the imperative of politically motivated involvement and the responses demanded by planning.

5.3.2 Addressing Broader Policy in Planning

Throughout the process of planning in False Creek Flats during the 1990s and recently, implications to broader policies were identified as an imperative that planning needed to address in development of the Flats policy framework. Two policies are raised in this section to highlight the importance of addressing broader policy objectives. The first is the ILS of 1995. The ILS was utilized as a point of debate about whether the allowance of high-technology sectors into established industrial zones would be detrimental to the functioning of city serving industries. It was decided that high-technology activities would
not be detrimental if they located in industrial areas so long as actions to update industrial zoning uses across the city were undertaken (City of Vancouver, 1995; 1996b). The second broader policy is the City of Vancouver’s Transportation Plan. The city was determined to ensure that commercial and high-technology oriented growth in the Flats did not occur contrary to the guidelines of the transportation policy. These guidelines were to make certain that concentrations of commercial and employment activity be located in close proximity to transit service. In response, the high-technology policy framework in False Creek Flats was formed to adhere to the Transportation Plan rather than changing or subverting the policy, as had been done with the ILS.

These two policies show the importance of not only addressing the significance of broader policy, but also questioning their relevance to the case or initiatives in question. In the False Creek Flats case, an imperative to planning was determining if a balance existed between allowing contemporary industrial activity uses into certain districts while maintaining elements of the Industrial Lands Strategy. The City of Vancouver decided that the industrial lands policy needed to be more flexible in commercial and industrial use allowances and was adjusted accordingly. This approach was not employed when referencing the city’s Transportation Plan as planning chose to uphold the policy. This section has discussed planning responses that arise with respect to balancing priorities of maintaining policy or going forth with new directions that may contradict existing policies.

5.3.3 Flexibility in the Planning Process: Adapting to Change

False Creek Flats has gone through numerous changes since Vancouver’s Central Area Planning Division started exploring the areas future in 1995. Investigation in the Finning property began as early as 1993, with Bob Laurie approaching the city about
proposals for the property (Appelbe, 2001). Throughout policy formation for the Flats with regard to establishing and defining new I-3, CD-1 and I-2 zoning districts, constant changes were occurring over various details in the zoning. Adjustments to policy were aimed at creating appropriate spaces and specialized land use designation in portions of the Flats that could prove to be attractive for high-technology firms to locate within. Examples of policy changes are most evident in the formation of the new zoning district schedules (I-3; CD-1(402)) and the use definitions that form part of the regulatory structure. Three separate city initiated rezonings have occurred since 1995. These were the change to an I-2 industrial district for a majority of the Flats, which were followed by the separate rezonings to I-3 and the Comprehensive Development zoning being applied to the Finning site in 1999. One of the main shifts was for planning to recommend the creation of an I-3 zoning district schedule that would cover certain aspects about permitted uses and density not adequately addressed in the I-2 schedule (City of Vancouver, 1999c). Although the I-3 district schedule addressed numerous issues, the primary change was the application of a new use definition and its allowance to a higher density than previously permitted. The new use definition related to high-technology activities that required office functions to serve as production spaces for sector firms. ‘Information technology’ was thereby termed as a use and permitted to a higher density in the I-3 district schedule.

The purpose of describing this narrative on change in planning process and policy formation is to underline the need for planning to remain flexible. At the same time, planning must remain open to changes in policy as a means to ensure that the outcome, despite any amount of changes that occurred, is closer to what was envisioned for the area. Constantly refining existing and new land use policies coinciding with gradual implementation after the approval of the policy framework is essential. This is especially
pronounced in the case of the Flats where ‘frontier’ commercial and industrial initiatives characterize the planning. The planning department has had little experience in creating a policy framework aimed at attracting high-technology firms, which enforces the notion of utilizing a planning model based on flexibility.

These same imperatives can be applied to planning and its ability in adapting to market changes, similar to the fallout of the high-technology market in 2000. In the case of market downturns, city interests are at risk, but not nearly as much as private developers. An editorial about market effect on the Flats states the city and planning department as oblivious to a certain degree to temporary high-technology sector decline (Stueck, 2001). From the city’s perspective, the development timeframe can be lengthened to take into account market variations (Stueck, 2001). Therefore, it is imperative for planning to adhere to the guiding principles of policy and overall vision for False Creek Flats. This requires structuring policy so as not to be dependent or overly inclined to market focused initiatives outside the scope and control of urban planning.

5.3.4 Exploring Innovation in Planning

Planning in False Creek Flats has been a unique initiative as old and new policy mechanisms have been employed to facilitate high-technology sector development. During the rezoning process for the Finning site, partnerships were formed between city staff and property owner representatives (It is important to note that public and private affiliations between city and developer representatives are not uncommon in Vancouver). In the Finning rezoning, planners and property interests were in agreement about the need to create a more specialized comprehensive district zoning for the site. This gave control to planners concerning the overall uses, building regulations and design guidelines applicable
over the entire site. Furthermore, a comprehensive district zoning would assist in better integrating the site with surrounding residential areas. In order for planners and Finning to achieve their aims a working partnership was formed to organize the appropriate mix of uses, density and regulations contained in the zoning.

Incorporating the relevant information, data and field research to inform recommendations to council about the ramifications of creating a high-technology oriented zoning for the Flats was crucial to justify later policy statements. Planning initiatives and policy formation applicable to this specialized form of development was relatively new to planning staff. Information had to be researched and documented. The discussion paper produced by the Central Area Planning Division titled, 'High-Tech Industry in the Urban Context', was the culmination of field research efforts (City of Vancouver, 1998a). A planning issue specific to the Flats was the need for planners to provide evidence to inform policy implementation with respect to permitted uses, density, design guidelines, and other aspects crucial to the creation of a functioning, attractive high-technology zone. The discussion paper provided some of this evidence that planners required to justify policy approaches in the Flats. The paper also addressed concerns raised by council and private sector interests as well as contributing to the overall visioning process for the area.

Innovation of planning practices is absolutely critical in meeting the challenges in the Flats. Utilizing public/private partnerships and field research in the planning process represents innovative practices applied in the Flats.

5.3.5 Imperatives in the Flats that Planning has not Addressed

The purpose of this section is to present two imperatives to planning that have not been fully addressed through the policy framework formation process or its implementation.
in False Creek Flats. The first relates to the linkages between the Central Area Plan (CAP) policy for Vancouver and high-technology led development in False Creek Flats. The potential total production and office space dedicated to high-technology industry in the Flats is significant compared to office space in other commercial districts in the city. To illustrate, if built to maximum permitted density (FSR: 3.0), the I-3 industrial district and Finning’s CD-1 site could generate approximately 16 million sq/ft. of office space. Vancouver’s downtown and Broadway commercial centers have a built office space capacity of approximately 30 million sq/ft. (City of Vancouver, 1999d; 1999c). This underlines the potential magnitude of extensive high-technology sector development in the Flats on the rest of the city’s commercial districts. However, little reference was made during the planning process to Vancouver’s CAP. This could have been due to False Creek Flats non-inclusion in the boundary defining the formal limits of the CAP. The implications of information technology office and related high-technology production space in the Flats were not referenced to the city’s CAP, so there is no strategic policy reference. It was impossible at the time for the CAP, approved in 1991, to predict the impact of high-technology led development in False Creek Flats. Subsequent changes makes it imperative that planning examines the positive and negative impacts that intensive high-technology commercial and industrial space development will have on the surrounding commercial districts. Exploring these issues may result in initiatives to incorporate changes into the CAP to reflect the evolving commercial and industrial structure of Vancouver. Planning staff has recently initiated discussions about updating the CAP to address some of these issues (Naylor, 2002). The second imperative relates to the potential build out of the False Creek Flats high-technology zoned areas. If market conditions improve resulting in an increase in developer investment and high-technology firm location, city staff and council should consider imposing stricter limits with regard to allowable information technology floor space over the I-3, Finning site and I-2
zoned districts in the Flats. This imperative would help address the concerns of high-technology production space demand exceeding the original boundaries established by the current policy framework in False Creek Flats. Discussion initiated now about how much land the city is willing to commit in the future towards specialized high-technology industrial districts and what the implications would be to external commercial areas may provide a refined vision of current high-technology initiatives in the Flats.

### 5.3.6 Planning and Visioning in False Creek Flats

One of the implications of initiating a high-technology led development strategy in False Creek Flats is the development of a compelling vision for the area. Planning's contribution to a vision for the entire site may help delineate the differences between the I-2 and I-3 zoning districts. For instance, certain high-technology activities are allowed in both, yet the inclusion of information technology as an office use and its allowance to a maximum permitted density of 3.0 FSR are particular to the I-3 zoning. This may help clarify the permitted uses for potential high-technology firms and developers. During the planning process involving committee discussions among planners and council, False Creek Flats future was envisioned as a major commercial activity center. It was referenced as being a 'third' downtown that would contribute to the existing economic structure of the city. The *False Creek Flats Urban Structure Plan* approved in principal by council outlined short term and long term goals with respect to the structure of sites, future subdivision, transportation infrastructure, pedestrian linkages and green spaces (City of Vancouver, 2001). A Central Area Division planner stated that if the city were inclined to more intensive planning control over the Flats, initiatives to form an Official Development Plan with a mandate over the entire area would be the next planning task (Naylor, 2002). This progression in planning would involve extensive visioning processes for the Flats. A final imperative that this thesis
underlines is referencing opportunities to high-technology firms locating in False Creek Flats. One planner stated the I-3 and *Great Northern Technology Park* zoning as providing excellent expansion opportunities to high-technology firms that are growing out of their existing production and office spaces. Due to property subdivision and ownership in the Flats, developers have the opportunity to directly market sites to these types of growing firms where features of larger building floor-plates, high-technology infrastructure, supporting service activities and overall image associated with the area may prove advantageous (Naylor, 2002). Rather than the Flats providing competitive production and office space compared to Yaletown and other established high-technology districts, development parcels in the area would be oriented to firms whose requirements are not being met by their existing location (Naylor, 2002). It is important to note that committing to a market niche in the development of specialized office and production spaces for high-technology industries should be done with caution as this may result in a policy framework for False Creek Flats being susceptible to market fluctuations as most recently demonstrated.

### 5.4 Pertinent Socio-Economic Issues in the Flats

In the conclusion of the case study, socio-economic ramifications of high-technology led development in False Creek Flats were acknowledged. Due to limitations placed by the research objectives, an acknowledgement of these broader issues is presented in this final section. Socio-economic concerns raised in regard to technology-led development in the Flats relate principally to impacts on adjacent neighborhoods, particularly in Strathcona and Mount Pleasant. Questioning how the community responds to initiatives in the Flats is crucial to the management of externalities. Socio-economic impacts are pertinent concerns in these neighborhoods as prospects of inflating land values and related displacement of
people and functioning communities may emerge as a negative consequence of 'new economy' intensive development. Questions can also be raised concerning the relative weight accorded to economic benefits vis-à-vis broader social impact concerns.

Socio-economic issues exist within the False Creek Flats area and should be addressed by planners and other public bodies. For instance, live-work uses have the potential to impact land values and overall industrial activity structure in the Flats. An important concern for Vancouver is the possible conflict between industrial live-work uses and high-technology firms. These might relate to what type of industrial live-work use is permitted and to what extent the city is willing to commit to this land use. The issues stated in this section are acknowledged by this thesis as important socio-economic concerns that will have impacts on the Flats area and neighboring residential districts. Although these questions were beyond the scope of this thesis, future research may consider them a priority.

5.5 Conclusion

This chapter has examined the planning imperatives for high-technology led development strategies in False Creek Flats. The first two sections provided an internal examination of reactions from city council and staff as well as external reaction from private interests in high-technology firms and developers. Market downturns in high-technology sectors have been significant in the Flats, as only a handful of firms have managed to locate in the Flats relative to expectations. The influence of politics in planning high-technology initiatives for the Flats was found to be very influential in promoting and motivating development. Discussion on these issues led to a set of planning imperatives applicable to False Creek Flats. These planning responses are planning guided by assertive
fundamentals, the need to integrate policy in the Flats with broader citywide policies, adaptability in the planning process and the need for further structuring of a vision for False Creek Flats. This chapter concludes the analytical portion of the thesis, focusing on describing the policy framework, examining the ensuing planning process and exploring planning responses specific to the False Creek Flats high-technology initiatives. The final chapter provides closing remarks that include an overview of the issues discussed and how they were organized in the thesis. The concluding chapter also explains some of the lessons learnt through the False Creek Flats case study.
Chapter 5: Figures

Figure 5.1: Location of Existing High-Technology Oriented Firms, Facilities and Developing Projects in False Creek Flats.

Source: City of Vancouver, 2002a (Planning Department)
Figure 5.2: *Quadra Logic Technologies'* Facility in False Creek Flats (I-3 Zoning).

Figure 5.3: Property Adjacent to *Quadra Logic Technologies'* Building in False Creek Flats Purchased by *QLT* for Future Expansion.
Figure 5.4: Building Along Terminal Avenue Leasing Space to *Radical Entertainment* (I-3 Zoning).

Figure 5.5: *Discovery Parks Incorporated: False Creek Research Park Facility* (I-2 Zoning).
Figure 5.6: The 18-Acre Property Acquired by Schroeder Properties for the Tech-Park.com Project in False Creek Flats.

Figure 5.7: Development Application Board for Phase 1 of the Tech-Park.com Project.
Figure 5.8: Plan View Diagram of the Entire Tech-Park.com Project.

Source: Tech-Park.com, 2002
Chapter 6
Conclusion: Summary of Findings and Future Research Priorities

6.0 Introduction

This chapter is structured into three sections. The first revisits the problem statement and research question to identify the planning imperatives according to high-technology initiatives designed to induce development in the Flats. Examining the application of the induced versus spontaneous development spectrum as part of the analytical framework is provided in this section as well. Broader findings that are not directly associated with the original research objectives, but are important to the overall development of False Creek Flats, is explored in the second section. The third section presents a narrative of topics pertaining to the future direction for high-technology sector development in the Flats and future research priorities.

6.1 Induced Development in the Flats: Reviewing Objectives and Findings

Reference to the problem statement, research objectives and primary research question is the focus of this section. The intent is to summarize the imperatives to planning as they relate to the False Creek Flats case study and policy analysis perspective of this thesis.

6.1.1 Linking the Problem Statement, Research Objectives and Findings

The problem statement related the attractiveness of high-technology sector industries as a mechanism or catalyst for revitalizing sites within metropolitan areas, thus contributing to the overall urban space-economy of the city. Strategies designed to attract
high-technology sector development are evident in Western European and North American cities. Primary motivations were oriented around increased economic activity and related job growth. Sometimes this was carried out in cities or regions with information technology industries and sector resources. Other cases exemplified municipal attempts at creating an attractive environment for the location of this industrial sector where none had existed before. Policy statements, land use designation and other initiatives designed to induce high-technology sector industries to locate in a particular spatial area were often implemented in such a manner that they were considered to be separate from the urban space-economy context they would be operating within. As each case of high-technology sector formation was extremely sensitive to local conditions, questions were posed about the legitimacy of implementing high-technology sector strategies taken from outside precedents. Policy statements aimed at the creation of attractive environments for high-technology development did not fully take into account the broader impacts on city structure and function. However, imperatives relating to problems of high-technology initiatives in inner-city contexts could be addressed by certain approaches to planning process. This thesis underlined how high-technology development strategies and their implementation through planning are inextricably linked.

The False Creek Flats high-technology initiatives in the City of Vancouver were utilized as the primary case study to situate and address the aforementioned issues. The research objectives were oriented towards the purpose of conducting a policy analysis of the False Creek Flats framework for high-technology sector formation to determine planning priorities in initiating a development strategy of this nature. Before an analysis of planning opportunities could begin, an analytical framework was established to structure examination. Therefore, the primary research question concentrated on creating an
induced versus spontaneous development spectrum upon which the False Creek Flats initiative for high-technology led sector formation could be situated. From this classification, imperatives to planning could be recognized and discussed.

A principal finding in this thesis was the identification of the False Creek Flats high-technology initiative primarily as an induced development. This was owing to the proactive planning position taken throughout the policy framework formation process. Furthermore, incentives in the form of planning land use mechanisms were employed to create an attractive environment as a precondition to the location of any high-technology firm in the area. Land use zoning in the Flats was specially designed to impose certain development restrictions, while at the same time including regulations attractive to high-technology firm requirements, thus creating conditions necessary for development interest.

Planning played a very important role in developing, initiating and implementing opportunities for high-technology firms to locate operations in portions of the False Creek Flats area. A summary of the planning imperatives discussed as essential to high-technology sector formation along induced development patterns exhibited in the Flats case study follows. A proactive stance taken by the City of Vancouver and its planning department was found to be crucial in the policy development process. This assertive position can be related to the conditions necessary for what the city described as crucial in creating "an atmosphere that encourages a clustering of high-technology activity" (City of Vancouver, 1999c, p.07). It was also found that political motivation significantly influenced planning, the position taken by city staff and the resulting policy. A second planning issue was the importance of addressing broader citywide policies that would directly or indirectly be impacted by high-technology initiated development in the Flats. Flexibility was stressed
to be an important characteristic of planning as the policy framework construction and
timeline of events over the past eight years in False Creek Flats clearly shows how change
can shift policy direction and influence the planning process. Another priority was planning
innovation in False Creek Flats. The concept of innovation relates to planning that evolves
appropriate mechanisms to properly address the requirements of high-technology industry
and inform the succeeding policy. The final imperative to planning was the function of
visioning in determining a succinct set of objectives for policy implementation in False Creek
Flats. It was stated that visioning processes remained an important element in the False
Creek Flats case study, yet time and market fluctuations could prove detrimental to the
original objectives of high-technology initiatives envisioned for the area.

The inner-city context for the False Creek Flats case study raises implications for
planning, especially with regard to implementing high-technology oriented policies. An
important lesson derived from an analysis of high-technology led development strategies
concerns problems of reliance on outside case studies. High-technology development is
demonstrably sensitive to local conditions. Features deemed unique to the False Creek
Flats case study were its location in proximity to Vancouver’s metropolitan core, the existing
space-economy of the city, broader citywide policies and the capacity for high-technology
sectors to locate in the Flats. The existing base of high-technology firms in Vancouver,
human capital and labour market conditions also contribute to the ‘local’ distinctiveness of
the case study. These unique features make outside examples useful in the sense of
situating and informing decisions rather than providing precedence for policy creation.
Planning must also be aware of the special issues associated with implementing policy in
inner-city environments. I would argue that the inner-city context amplifies the importance
and attention paid to policy due to the potential ramifications that such a project could have on Vancouver.

6.1.2 Examining the Application of the Induced versus Spontaneous Spectrum

This section describes the strengths and weaknesses of applying a model, based on induced and spontaneous high-technology development principles, to the False Creek Flats case study. A benefit of the spectrum model was that it allowed for the linkage between academic theories to be established with planning mechanisms and aspects involving high-technology property development. For instance, the induced versus spontaneous spectrum included theoretical concepts on how high-technology firms first became established which gave evidence to their operational characteristics. These features transmitted into notions of firm clustering based on milieu, innovation, inter-industry linkages and transfer of knowledge, which were then applied to the spectrum to determine their classification according to the model. The model also permitted the inclusion of real world examples of high-technology concentrations in the form of various ‘technopoles’ and science and technology parks. Information about how these sector concentrations came about were applied to the spectrum to determine if the path of development that they followed was of an induced or spontaneous nature. For the purposes of this thesis, the spectrum model helped to broadly classify the False Creek Flats case study as an induced development. This assisted in the organization of planning imperatives that resulted by following this induced development strategy in False Creek Flats.

Limitations of this spectrum model based on induced and spontaneous development exist. The first drawback relates to the spectrum’s application and specificity to the thesis’ research objectives and False Creek Flats case study. It was stressed that the spectrum’s
function was to provide a model for the structuring of high-technology industries based upon characteristics they portrayed as individual and collective entities. As a result, the spectrum could be criticized as being too general in regards to using induced and spontaneous development paths as the only classification permitted by the model. Related to this criticism is the fact that many features of high-technology sector industry cannot be accurately categorized as residing on the induced or spontaneous side of the spectrum. This is the case in numerous high-technology clusters where academic and applied research institutions have played instrumental roles in firm formation. Resources offered by these institutes are often beneficial to both private and public sector interests. In addition, the institutions themselves are frequently the result of partnerships between governments, universities and private sector interests, which makes categorization on the spectrum difficult. The multi-university consortium holding land interests in the Great Northern Way campus are an example of public and private sector partnerships, thus making this project's classification on the spectrum complex. A final drawback is the spectrum's adequacy in being applied to different scales of high-technology projects. Although spatial scale was included as a characteristic in locating high-technology sector concentrations on the spectrum, the difficulty of this task increases with larger scale high-technology agglomerations. Complexities may arise due to increases in scale that the spectrum cannot take into account. Relevance to scale is evidenced in the thesis' literature review where it was outlined that high-technology concentrations could take the form of local clusters composed of small, interrelated firms or regional industrial complexes composed of numerous sector agglomerations and support infrastructure. In summary, the induced versus spontaneous spectrum may only apply to initiatives and at scales similar to that of the False Creek Flats case.
6.2 Broader Issues Raised in the False Creek Flats Case Study

The intent of this section is to present issues and research findings that offers insight into how planning has acted and reacted to broader concerns brought about in the False Creek Flats case study.

6.2.1 Planning and Balance

A recurrent theme throughout the False Creek Flats planning endeavor has been the demand for planning to address issues in which achieving balance among the interests involved is crucial for success in the short and long term. One of the first decisions involving balance was for the City of Vancouver to accept that high-technology sector activities were a recognizable and growing part of the city’s economy. On the other hand, planning also had to take into account conventional industries importance within Vancouver. Achieving a balance between high-technology and conventional industrial activities was a prevalent issue throughout the policy formation process in the Flats. Planning and its recommendation to permit high-technology uses in industrial districts throughout Vancouver stresses the importance planning placed upon the changing nature of industrial activities. Yet, planners were careful to ensure that conventional and city serving industrial space remained as new zoning was designed to include certain high-technology use and related service definitions rather than exclude existing industry. This position over new and existing industrial activities and the opportunity for change carried over into the balancing of city policy. Although city staff decided to recommend new policy formation to encourage an intensive high-technology development vision for portions of the Flats, reference to past policy was given throughout. Primary reasons for implementing policy would be to update and make new policy adequate in areas where former initiatives were inadequate or no longer relevant. In the False Creek Flats case study, planning sided with policy designed to
ensure that adaptive reuse of former industrial land would be guided into ‘new economy’ activities. Rather than maintaining the existing urban space-economy of Vancouver, planning chose to take a long-term outlook accounting for changes in the commercial and industrial structure of the city through land use policy. The commitment that planning made to ensure that land in the Flats was zoned specifically for information technology office and high-technology production space underlines the assertive position taken by the City of Vancouver. Opportunities for high-technology intensive development in the Flats rather than having sector firms locating in surrounding municipalities proved to be of great motivation to the city. This approach left the process and policy framework susceptible to market fluctuations. The creation of a supply of high-technology zoned land in a declining market resulted in a lack of development interest.

6.2.2 Gaps Between Academic Concepts and Planning Mechanisms

At this thesis’ onset, several academic theories about the characteristics and operation of high-technology firms were proposed to offer the opportunity for planning mechanisms to maximize economic advantages of firm concentration in an area. Some of the academic theories relate to economic advantages resulting from an agglomeration of interrelated high-technology oriented firms. This often translated into a space or district, where firm concentrations have occurred, as being identified with a competitive and desirable location. Other contributions made by academia relate to the formal and informal relationships in the form of knowledge transfer and collective learning operating in a defined high-technology cluster with an established ‘image’ that firms continually contribute to. A broad categorization of this feature has been termed as the development of an ‘innovative milieu’. I argue that planning and its contribution to the creation of any milieu or qualities
associated with the concept failed because it was beyond the current scope of planning exhibited in False Creek Flats.

The main reason for the gap between academic research and implemented planning mechanisms can be related to examining the influence of planning at the time of policy formation. At the scale and situation relevant to the False Creek Flats case study, this thesis proposes that planning is capable of creating suitable zoning for high-technology industry. Powers of land use zoning, regulation and control by planning can transmit into the creation of specially designated land, which is what happened in the False Creek Flats rezoning to I-3 and CD-1 (402: Great Northern Technology Park) in 1999. This is the extent of influence planning has on the formation of features that academia refers to as agglomeration economies, inter-industrial linkages and innovative milieu. Therefore, planning as evidenced in the high-technology initiatives employed in the False Creek Flats area remains attached to land use designation and associated regulations defined in the zoning. During the policy formation, a guiding principal that the City of Vancouver stated was to "ensure an adequate supply of land for all high-technology activity and provide an atmosphere that encourages a clustering of high-technology industry" (City of Vancouver, 1999c, p.07). Planning in the Flats did have control over creating a supply of land, but its contribution to an atmosphere attractive to the high-technology sector is questionable. A reason for this is that planning in the Flats is still attached to physical controls.

6.2.3 Planning and Risk

Analyzing factors of risk to the interests involved in the Flats gave insight into how levels of risk effected subsequent actions. The City of Vancouver and its planning department did have a factor of risk to take into account, which is to be expected with any
new initiative. This was pronounced in the False Creek Flats case where lack of
precedence, conditions unique to the area and city staff’s relatively new exposure in
planning for high-technology led strategies contributed to the level of risk to the city. Risk
was associated with the politically motivated decision to support the high-technology policy
framework for the Flats. Another type of risk is the pressure placed on planning to
recommend policy that meets the requirements of the city and high-technology firms. A
significant amount of risk is also associated with the broader implications that planning had
to take into account in regards to committing a large portion of land for intensive high-
technology development. In the case of the Flats, industrial activities will be displaced and
it is possible that land serving conventional industries will be placed in competition to high-
technology zoned industrial districts. This can exert external market influences originally
unintended by policy. Therefore, adaptive reuse strategies have to examine impacts of
implementation. Planning and risk is not only limited to ensuring that policy accurately
reflects the needs of the city and industry, but can also extent to issues, areas and activities
outside of the policies mandate.

The risk attached to developers and high-technology firms locating facilities within
the Flats is vastly different to the risk associated with planning and the City of Vancouver’s
position. Initiation of the policy framework in False Creek Flats was actively pursued by the
city. Yet, investors, developers and high-technology firms are still taking a majority of the
investment risk. A luxury allotted to the city and not to other interests is time. If planning
and city interests were to get involved in offering monetary inducements to high-technology
firms or to influence the property market outside the parameters of land use zoning, then
the amount of risk would increase. However, this approach was not taken in the case of
False Creek Flats. Closing remarks are stated about future development issues in False Creek Flats and areas for further research in the following section.

6.3 Directions for Future Development and Research in the Flats

This final section explores some of the issues that the False Creek Flats high-technology led initiatives will face in the future. Due to the nature of the relatively new policy framework, many areas for further research exist into topics surrounding the Flats case study. An important planning imperative that has not gotten a chance to be implemented in the Flats is time. Since the policy framework for the Great Northern Technology Park and I-3 zoning district schedule was approved in 1999, numerous changes have occurred. These have taken the form of amendments to the actual zoning regulations as well as shifting patterns of development and high-technology related investment throughout the Flats. The planning department in the City of Vancouver has structured the False Creek Flats Urban Structure Plan around a 20-year period. Planning based this number on a consultant's recommendation about the amount of office and production space that could be absorbed by the high-technology sector on an annual basis (City of Vancouver, 2001). Market fluctuations, such as the one currently being experienced, will figure significantly in reshaping the outlined time period. A primary drawback throughout this thesis is the short span of time since the high-technology initiatives implementation resulting in a lack of evidence to address concerns about development impacts in the Flats to other commercial districts in the city and region.

Many opportunities for further research are apparent around issues of high-technology and related development in False Creek Flats. In closing, this thesis proposes two areas for future research that are linked to concerns raised during the policy framework
formation process. The first involves a closer examination of regional concerns brought forth by city staff and the GVRD. This thesis raises the issue about the existence of a gap between the City of Vancouver and GVRD policies on the future directions of commercial and industrial land. Debates about how much new industrial and commercial space can be designated and where it can be located is sure to be a growing issue in the GVRD. These conflicts may become increasingly common as other municipalities outside of Vancouver look at high-technology and related ‘new economy’ sectors as an area to concentrate industrial policy. Therefore, future research priorities would be to explore the division between municipal and regional commercial policies, making recommendations about how regional policies can be more fully integrated with municipal interests. The same can be said about municipal policy direction being able to address regional concerns.

As development increases over time in False Creek Flats, more information and research will be required to examine the impacts on proximate commercial centers throughout Vancouver. The City of Vancouver has initiated a monitoring program to observe floor space creation and the type of activities that are choosing to locate within the different zoning districts in False Creek Flats. This monitoring program also suggests examining the same elements of floor space creation in proximate commercial districts such as the downtown core (City of Vancouver, 1999d). Research addressing these concerns may help in defining the function and connection that intensive commercial development in the Flats would have with Vancouver’s Central Area Plan policy statement.

In closing, this thesis describes future planning directions for the False Creek Flats area. The city’s approach based upon recommendations made by planning to initiate a development strategy involving high-technology commercial and industrial activity in the
Inducing Spontaneity: High-Technology Led Development in False Creek Flats
Chapter 6: Conclusion: Summary of Findings and Future Research Priorities

Flats was an ambitious endeavor. The 125-acres zoned for intensive development of information technology uses can be viewed as an experiment that will be subject to criticism and scrutiny over time. One strategy that planning can partake in to address these concerns and ensure the successful development of the site is to recognize unique development potentials. One planner in the Central Area Division has identified the opportunity for portions of the site to be marketed towards expanding high-technology firms that are either looking for completely new production space facilities or are having difficulty modifying their existing space to meet current needs. Emphasis was placed on the diversity and ability of development parcels in the Flats to cater to the needs of growing firms by offering larger floor-plates and the opportunity for firms to completely design production space according to their requirements. This type of development pattern would involve the location of medium to large high-technology firms into the Flats as the formation of any technology sector concentration would be driven by major tenants in the area (Naylor, 2002). As infrastructure and plans to fulfill the long-term goals set forth in the False Creek Flats Urban Structure Plan are realized, sites may be explored with more interest. Making certain that a separation does not occur between high-technology firm requirements and planning action will be a priority for future development in the Flats. The formation of an Official Development Plan for False Creek Flats could be one mechanism utilized to assure that development guidelines maintain a vision that is acceptable to planning and industry as well as being accountable to public concerns (Naylor, 2002). Planning action in the future will be the decisive force in maintaining the originally envisioned robustness of high-technology sector initiatives and related policies in False Creek Flats. Exploring factors of risk and adapting accordingly to maintain the level of control that planning is informed enough to make recommendations on is going to be crucial, as was underlined in recent planning ventures in False Creek Flats.
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Inducing Spontaneity: High-Technology Led Development in False Creek Flats

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Appendix A: Glossary of Terms

Section A:

Terms listed in this section have been used throughout the chapters of this thesis. The following definitions were taken from sources external to the literature review.¹

Agglomeration: The spatial grouping together of activities and people for mutual benefit. In a more particular context it is applied to the association of productive activities in close proximity to one another, which improves their efficiency through the collective use of infrastructure (Goodhall, 1987, p.16). Agglomeration also facilitates the rapid circulation of capital, commodities and labour (Johnston et. al., 2000, p.04).

Cluster: A term used to describe the close proximity or grouping of settlements or other activities in any spatial distribution (Goodhall, 1987, p.73).

Concentration and Centralization: Two terms often used synonymously with each other. These terms refer to the tendency towards the localization of economic activity in and around a small number of urban centers or areas (Johnston et. al., 2000, p.65). Concentration and centralization tendencies arise largely from the fact that economic activity is becoming organized in units of increasing size within a hierarchical organization structure (Goodhall, 1987, p.87).

Industrial Organization: The structure within which the functions of control and decision-making are exercised in the process of industrial production (Johnston, 2000, p.222-223).

Locale: A setting for social interaction that includes economic type activities and relationships. A locale is defined by physical properties such as boundaries or the built environment. However, a locale is also defined by the various utilizations of that space by human activity (Johnston et. al., 2000, p.263).

Proximity: Relating to the location, and specifically nearness, as defined by space and time.

Section B:

Terms listed in this section have already been defined in the text contained within the thesis. Definitions have been referenced directly out of material contained in the literature review. These terms are referenced in the glossary to reiterate the definitions.

Agglomeration Economies: These can be defined as a decrease in production costs and increase in productivity as a result of the location of related or sector specific firms in close proximity to one another. Agglomeration economies can be further defined into localization and urban economies.

- Localization Economies: These are economic advantages arising from firms involved in the same or linked industries.
- Urban Economies: These are economic advantages and benefits that ensue from firms locating in urban areas. (Malecki, 1997, p.113)

High-Technology Sector Industries: ‘High-Technology’ is used to refer to firms and industries whose products or services embody new, innovative and advanced technologies developed by the application of science and technological expertise. Such firms almost invariably regard such expertise and resultant technological leadership as the firm’s leading competitive advantage, and are usually identified in practice by high research and development (R&D) intensity. (Keeble & Wilkinson, 1999, p.03).

Innovative Milieu: The innovative milieu concept focuses on innovation by firms as the key ‘motor of growth’ of local and national economies, and argues that innovation is fundamentally a collective process, innovation is a complex and interactive process, innovation stems from the creative combination of generic know-how and specific competencies, and territorial organization is an essential component of the process of techno-economic creation. Therefore, innovative milieu is defined as a set of territorial relationships encompassing in a coherent way a production system, different economic and social actors, a specific culture and representation system and generating a dynamic collective learning process whereby innovation is sustained and uncertainty minimized. The innovative milieu concept thus emphasizes the importance for firm innovative activity of inter-firm relationships, territorial socio-economic embeddedness, and dynamic local collective learning processes. (Keeble & Wilkinson, 1999, p.10)

Space-Economy: This is a term utilized to describe the spatial patterns and characteristics of various economic and industrial sectors. It refers to the spatial structuring of the economy. (Goodhall, 1987, p.445)
Appendix B:

1–3 District Schedule: Zoning and Development By-law

1–3 Zoning District Land Use and Development Policies and Guidelines
I-3 District Schedule

1 Intent

The intent of this Schedule is to permit high technology industry, and related industry with a significant amount of research and development activity. It is also the intent to permit light industrial uses that are generally compatible with high-technology and other industrial uses, and with adjoining residential or commercial districts.

2 Outright Approval Uses

2.1 Subject to all other provisions of this By-law, including the additional regulations in section 11.3 of this By-law, and to compliance with section 2.3 and the regulations of this Schedule, the uses noted in section 2.2 shall be permitted in this District and shall be issued a permit.

2.2 Uses

2.2.A Accessory Buildings customarily ancillary to any of the uses listed in this Schedule, except that:

(a) an accessory building must not exceed 4.6 m in height, and must not exceed 3.7 m in height measured to the highest point of the roof if a flat roof, to the deck line of a mansard roof, or to the mean height level between the eaves and ridge of a gable, hip, or gambrel roof;

(b) an accessory building must be situate in the rear yard no less than 3.1 m from the ultimate centre line of any rear or flanking lane; and

(c) an accessory building's total floor area, measured to the extreme outer limits of the building, must not exceed 10% of the total area of the site.

2.2.M [Manufacturing]

- Electrical Products or Appliances Manufacturing.
- Miscellaneous Products Manufacturing - Class B.
- Printing or Publishing.
- Software Manufacturing.

2.2.O [Office]

- General Office, but limited to Information Technology.

2.2.S [Service]

- Laboratory.
- Photofinishing or Photography Laboratory.
- Production or Rehearsal Studio.
- Work Shop.
2.2. U [Utility and Communication]

- Radiocommunication Station.

2.3 Conditions of Use

2.3.1 No use listed in section 2.2 of this Schedule, except a production or rehearsal studio, shall be carried on other than wholly within a completely enclosed building, except for off-street parking and loading, heating and mechanical equipment, or other facilities or equipment which in the opinion of the Director of Planning are similar to the foregoing.

2.3.2 No use listed in section 2.2 of this Schedule shall involve the bulk storage, pending ultimate distribution off site, of explosives, fireworks, ammunition, matches, or flares; radioactive material; coal tar products or derivatives; or compressed gas or petroleum.

2.3.3 No use listed in section 2.2 of this Schedule shall involve the storage, other than wholly within a completely enclosed building, of lime; fertilizer; toxic or corrosive chemicals or acids; flammable liquids or solids; scrap or junk; rags or cotton waste; fungicides, herbicides or pesticides; paint, varnish, oil shellac or turpentine; grain, hops, or sugar; fish, fish oil or meal, animal oil or fat, or vegetable oil.

2.3.4 No use listed in section 2.2 of this Schedule, except for a laboratory, shall involve the keeping of live animals.

3 Conditional Approval Uses

3.1 Subject to all other provisions of this By-law, including section 3.3.3 and the additional regulations in section 11.3 of this By-law, and the provisions and regulations of this Schedule, the Development Permit Board may approve any of the uses listed in section 3.2, subject to the conditions of use in section 3.3, and including such other conditions as it may decide, provided that it first considers:

(a) the intent of this Schedule and all applicable policies and guidelines adopted by Council; and
(b) the submission of any advisory group, property owner or tenant.

3.2 Uses

3.2. A Accessory Uses to any of the uses listed in this Schedule, other than as provided for in section 2.2.A of this Schedule.

3.2. C [Cultural and Recreational]

- Artist Studio - Class B, subject to the provisions of section 11.18 of this By-law, and provided that the change of use applies to floor space existing as of September 10, 1996 and additions are limited to a maximum of 10 percent of the existing floor space.
- Community Centre or Neighbourhood House.
- Fitness Centre.
- Hall.
- Marina.
- Park or Playground.

3.2. D Deposition or extraction of material so as to alter the configuration of the land.

3.2. DW [Dwelling]
• Dwelling Unit for a caretaker or watchman or other person similarly employed, if such dwelling unit is considered to be essential to the operation of the business or establishment.
• Residential Unit associated with and forming an integral part of an Artist Studio - Class B, subject to the provisions of section II.19 of this By-law.

3.2.I [Institutional]
• Ambulance Station.
• Child Day Care Facility.
• Public Authority Use.
• School - University or College.
• Social Service Centre.

3.2.M [Manufacturing]
• Bakery Products Manufacturing.
• Batteries Manufacturing.
• Brewing or Distilling.
• Chemicals or Chemical Products Manufacturing - Class B.
• Clothing Manufacturing.
• Dairy Products Manufacturing.
• Food or Beverage Products Manufacturing - Class A existing as of July 20, 1999.
• Food or Beverage Products Manufacturing - Class B.
• Furniture or Fixtures Manufacturing.
• Ice Manufacturing.
• Jewellery Manufacturing.
• Leather Products Manufacturing.
• Machinery or Equipment Manufacturing.
• Metal Products Manufacturing - Class B.
• Miscellaneous Products Manufacturing - Class A.
• Motor Vehicle Parts Manufacturing.
• Non-metallic Mineral Products Manufacturing - Class B.
• Paper Products Manufacturing.
• Plastic Products Manufacturing.
• Rubber Products Manufacturing.
• Shoes or Boots Manufacturing.
• Textiles or Knit Goods Manufacturing.
• Tobacco Products Manufacturing.
• Transportation Equipment Manufacturing.
• Wood Products Manufacturing - Class B.

3.2.O [Office]
• General Office, but not including the offices of accountants, lawyers and notary publics, nor the offices of real estate, advertising, insurance, travel and ticket agencies.

3.2.P [Parking]
• Parking Uses.

3.2.R [Retail]
• Gasoline Station - Full Serve, subject to the provisions of section II.10 of this By-law.
• Gasoline Station - Split Island, subject to the provisions of section 11.10 of this By-law.
• Vehicle Dealer, but limited to the rental of motor vehicles.
3.2.S  [Service]

- Animal Clinic.
- Catering Establishment.
- Laundry or Cleaning Plant.
- Motor Vehicle Repair Shop.
- Motor Vehicle Wash.
- Photofinishing or Photography Studio.
- Print Shop.
- Repair Shop - Class A.
- Repair Shop - Class B.
- Restaurant - Class 1, provided that the total floor area does not exceed 300 m².
- School - Arts or Self-Improvement.
- School - Business.
- School - Vocational or Trade.
- Sign Painting Shop.

3.2.T  [Transportation and Storage]

- Aircraft Landing Place.
- Cold Storage Plant.
- Marine Terminal or Berth.
- Packaging Plant.
- Railway Station or Rail Yard.
- Storage Warehouse.
- Taxicab or Limousine Station.
- Truck Terminal or Courier Depot.

3.2.U  [Utility and Communication]

- Public Utility.
- Recycling Depot.

3.2.W  [Wholesale]

- Wholesaling - Class A.
- Wholesaling - Class B.

3.2.Z  Any other use which is not specifically listed and defined as a use in section 2 of this By-law but which the Development Permit Board considers comparable in nature to the uses listed in this Schedule, having regard to the intent of this District Schedule.

- A use which is listed in section 2 of this Schedule but does not comply with the conditions of use in section 2.3.

3.3  Conditions of Use

3.3.1  No use listed in section 3.2 of this Schedule, except a gasoline station, vehicle dealer, parking uses and transportation and storage uses, shall be carried on other than wholly within a completely enclosed building unless appropriate measures are taken, to the satisfaction of the Director of Planning, to eliminate any dangerous, injurious, noxious or otherwise objectionable impact that could adversely affect the surrounding area and adjoining non-industrial districts.

3.3.2  No use listed in section 3.2 of this Schedule shall involve the bulk storage, pending ultimate distribution off site, of explosives, fireworks, ammunition, matches, or flares; radioactive material; coal tar products or derivatives; or, except for a gasoline station, compressed gas or petroleum.
3.3.3 No use listed in section 3.2 of this Schedule shall involve the storage, other than wholly within a completely enclosed building, of lime; fertilizer; toxic or corrosive chemicals or acids; flammable liquids or solids; rags or cotton waste; fungicides, herbicides or pesticides; paint, varnish, oil shellac or turpentine; grain, hops, or sugar; fish, fish oil or meal, animal oil or fat, or vegetable oil.

3.3.4 No use listed in section 3.2 of this Schedule, except for an animal clinic, shall involve the keeping of live animals.

3.3.5 No use listed in section 3.2 of this Schedule shall involve the storage of goods or materials other than wholly within a completely enclosed building unless the yard or portion of the yard containing the goods or materials is enclosed by a suitable fence or wall restricting public access.

4 Regulations

All uses approved under sections 2 and 3 of this District Schedule shall be subject to the following regulations.

4.1 Site Area -- Not Applicable.

4.2 Frontage -- Not Applicable.

4.3 Height

4.3.1 The maximum height of a building shall be 18.3 m.

4.3.2 The Director of Planning or the Development Permit Board, as the case may be, may permit an increase in the maximum height of a building to a height not exceeding 30.5 m with respect to any development provided that he first considers:

(a) the intent of this Schedule, all applicable policies and guidelines adopted by Council and the relationship of the development with nearby residential districts;

(b) the submission of any advisory group, property owner or tenant; and

(c) the effect of building height, bulk and siting on daylight access and visual privacy of developments in nearby residential districts. Daylight access can be adequately maintained if there is no shadow impact at 10 a.m., noon and 2 p.m. on September 21 and March 21. Visual privacy can be achieved by separating building facades by 24.4 m.

4.4 Front Yard

4.4.1 No front yard shall be required.

4.5 Side Yards

4.5.1 No side yard shall be required, except that where the site adjoins, without the intervention of a lane, a site located in an R district, in which case a side yard with a minimum width of 1.5 m shall be provided adjoining the R district.

4.5.2 Where a side yard is provided, although not required, a side yard with a minimum depth of 0.9 m shall be provided.

4.6 Rear Yard

4.6.1 A rear yard with a minimum depth of 3.1 m shall be provided, except that where the rear of the site abuts a lane, this required minimum depth shall be decreased by the lane width between the rear property line and the ultimate centre line of the lane.
4.6.2 The Director of Planning or the Development Permit Board, as the case may be, may waive the requirement to provide a rear yard where he is satisfied that the site is located within an area where rear access to the site and adjacent sites is not likely to be required and that site is sufficiently large to provide adequate open space.

4.7 Floor Space Ratio

4.7.1 The floor space ratio shall not exceed 3.0, subject to the following:

(a) the maximum floor space ratio shall be 3.0 for Manufacturing Uses, Transportation and Storage Uses, Utility and Communication Uses, Wholesale Uses, Service Uses listed in section 2.2.S, and Parking Uses;
(b) the maximum floor space ratio shall be 1.0 for all other uses combined;
(c) the floor area in Retail Uses, including accessory retail, shall not exceed 1 000 m²; and
(d) the floor area in Office Uses listed in section 3.2.O shall not exceed 33 percent of the total gross floor area of all principal and accessory uses combined.

4.7.2 The following shall be included in the computation of floor space ratio:

(a) all floors of all buildings including accessory buildings, both above and below ground level, to be measured to the extreme outer limits of the building.

4.7.3 The following shall be excluded in the computation of floor space ratio:

(a) open residential balconies or sundecks and any other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, provided that the total area of all exclusions does not exceed eight percent of the residential floor area being provided;
(b) patios and roof gardens, for residential purposes only, provided that the Director of Planning first approves the design of sunroofs and walls;
(c) where floors are used for off-street parking and loading, the taking on or discharging of passengers, bicycle storage, heating and mechanical equipment, or uses which in the opinion of the Director of Planning are similar to the foregoing, those floors or portions thereof so used, which:
   (i) are at or below the base surface, provided that the maximum exclusion for a parking space shall not exceed 7.3 m in length; or
   (ii) are above the base surface and where developed as off-street parking are located in an accessory building situated in the rear yard, provided that the maximum exclusion for a parking space shall not exceed 7.3 m in length;
(d) storage space associated with an Artist Studio - Class B where the space is provided below the base surface and subject to a maximum exclusion of 20 m² for each Artist Studio - Class B; and
(e) amenity areas for the social and recreational enjoyment of residents and employees, or providing a service to the public, including facilities for general fitness, general recreation and child day care provided that:
   (i) the total area being excluded shall not exceed the lesser of 20 percent of the permitted floor space or 100 m²; and
   (ii) in the case of a child day care centre, the Director of Planning, on the advice of the Director of Social Planning, is satisfied that there is a need for a day care facility in the building or in the immediate neighbourhood;
(f) where exterior walls greater than 152 mm in thickness have been recommended by a Building Envelope Professional as defined in the Building By-law, the area of the walls exceeding 152 mm, but to a maximum exclusion of 152 mm thickness, except that this clause shall not apply to walls in existence prior to March 14, 2000.
4.7.4 The Development Permit Board or the Director of Planning, as the case may be, may relax the provisions of section 4.7.1 up to a floor space ratio of 3.0 for Office Uses listed in section 2.2.0, if the Development Permit Board or the Director of Planning, as the case may be, first considers:

(d) the intent of the schedule, all applicable policies and guidelines adopted by Council, and the relationship of the development to any nearby residential uses;
(e) the height, bulk, location, and overall design of the building and its effect on the site, surrounding buildings, and streets; and
(f) the provision of roads and bike and pedestrian connections as outlined in plans and policies adopted by Council.

4.8 to 4.16 (Reserved)

4.17 External Design

4.17.1 Any fence, wall, or landscaping located along the street property line (which is, for the purposes of this section 4.17, the property line along an abutting street but not a lane) shall facilitate pedestrian interest to the satisfaction of the Director of Planning.

4.17.2 All garbage containers shall be enclosed, located, or screened so as not to be visible from the centre line of an abutting street.
I-3 DISTRICT GUIDELINES

False Creek Flats

Adopted by City Council July 30, 2002

False Creek Flats Structure Plan – Long-range View

- new parks & open space
- Greenway routes
- pedestrian connections
- existing SkyTrain line & Main St. Station
- Millennium Line & VCC Station
- potential extension of Millennium Line & Finning Station
- potential streetcar route
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Note: These guidelines are organized under standard headings. As a consequence, there are gaps in the numbering sequence where no guidelines apply.
1 Application and Intent

The following policies and guidelines apply to all sites zoned I-3 that lie within the False Creek Flats Industrial Area, as shown in Figure 1 below.

The guidelines are to assist applicants in preparing, and staff and Council in evaluating proposed developments. The guidelines are to be used in conjunction with the False Creek Flats Structure Plan and with the I-3 District Schedule of the Zoning and Development By-law.

The intent of these guidelines is to: assist in the creation of attractive, cohesive, urban developments for high-tech industry that display a high quality of urban design and architectural expression; integrate existing and future greenways, and pedestrian and bicycle connections; and improve and enhance the quality of the public realm in the False Creek Flats.

Figure 1. False Creek Flats Industrial Area Boundary (guidelines apply to all sites zoned I-3 within this boundary)
2 General Design Considerations

2.1 Neighbourhood Character
Formerly a tidal mud flat, the False Creek Flats was filled early in the 20th century to accommodate Vancouver's burgeoning rail industry. Today, it is a wide, open area of about 120 hectares (300 acres) that continues to serve the railways and conventional industries involved in warehousing and transhipment, however these uses have been in decline since the 1970s. Many properties now lay vacant. Land parcels vary considerably in size and configuration, and, due to the extent of the rail yards and trackage, the area is poorly served by roads. Likewise, there are few visual or pedestrian amenities.

The area is expected to emerge as a new high-tech and mixed-use employment centre with a distinct character that takes its cues from its industrial past and its high-tech future. New streets, greenways and parks are planned in the False Creek Flats Structure Plan to be implemented through gradual redevelopment. The intention is to increase accessibility for pedestrians, bicycles and vehicles throughout the area, linking the Flats to its surroundings and creating an urban public realm of high quality. Private developments will need to assist the transition through careful site planning, high quality architectural building expression, public and private landscaping, and appropriate pedestrian and vehicular circulation, as set out in these guidelines.

2.2 Street Character
With the arrival of new uses in the False Creek Flats, a more active, interesting and attractive pedestrian-oriented street character and an enhanced public realm become priorities. To create a more urban street feeling, new buildings should locate close to the street or close to the landscape setback area, rather than back from the street behind surface parking. Windows at grade are essential to enhance the pedestrian experience and to provide transparency for casual surveillance. On large development sites, small public open spaces linking to area greenways and bikeways should be created at strategic points to allow meeting and resting places for employees and pedestrians. Street trees should be planted extensively throughout the area to create a more pleasant pedestrian environment, but also to introduce a unifying theme through co-ordination of species and placement. Terminal Avenue will be the focus of changes that will see the street better serve as a gateway into the Downtown.

(a) Streets should be designed and built in accordance with Engineering Services standards and requirements;
(b) Continuous sidewalks should be provided along all abutting street frontages;
(c) Streets should be designed to create distinct pedestrian-oriented precincts and to integrate with surrounding streetscapes;
(d) Street furniture should be durable, vandal resistant, and easily maintained; and
(e) The style of street furniture, including benches, trash receptacles, bike racks, and bollards, should be consistent throughout the public realm.

2.3 Orientation
Buildings should be sited to define streets and to form a vertical and horizontal built edge. Buildings should front the primary streets.

2.5 Topography: Adjustments to Grade
Any significant alterations of existing grade should support convenient pedestrian access to property, reflect the natural slope of the land, and help visually integrate building massing into the landscape.

2.11 Access and Circulation
(a) Traffic and parking analysis will be required for major developments to forecast traffic impacts. The City may require safety improvements for vehicular traffic as well as enhanced vehicle, pedestrian and bicycle facilities; and
(b) Vehicular circulation should occur on dedicated public streets and lanes as planned in the False Creek Flats Structure Plan, minimizing the use of internalized private roads (see Figure 3).
4 Guidelines Pertaining to the Regulations of the Zoning and Development By-law (and Parking By-law)

4.3 Height and Length

(a) The I-3 District Schedule permits an outright building height of up to 18.3 m (60 ft.). The Director of Planning may consider heights up to 30.5 m (100 ft.) after first considering the intent of the I-3A zoning and applicable policies and guidelines, public submissions, and the effect of building height and bulk on daylight access and nearby residential districts (see I-3 Schedule); and

(b) Higher building massing should respond to the scale of adjacent buildings, public and private views, and shadowing.

4.4 Front Yards (and Setbacks)

(a) Buildings should be set back a minimum of 3.0 m from the front property line so that a double row of trees may be planted along the site's full frontage (see Figure 2); and

(b) Below-grade encroachments into the yard area may be considered, provided that adequate soil depth is provided for the plant material.

Figure 2. False Creek Flats: Primary and Secondary Streets

![False Creek Flats: Primary and Secondary Streets](image-url)
4.5 Side Yards (and Setbacks)

(a) Generally side yards are not required, except that when a site borders a city street, buildings should be set back a minimum of 3.0 m from the side property line so that a double row of trees may be planted (see Figure 2); and

(b) Below-grade encroachments into the yard area may be considered, provided that adequate soil depth is provided for the plant material.

Figure 3. Cross-section and photo illustrating possible design treatments for setback area

4.9 Off-street Parking and Loading

(a) All off-street parking should be located in below- or above-grade structures or hidden in behind street-fronting buildings, however interim surface parking will be considered on sites of future phases of development, subject to front- and side-yard setbacks, and acceptable access points as determined by the Director of Planning in consultation with the City Engineer;

(b) Raised buildings with parking occupying the entire grade level are not acceptable, although the rear section of the floor may be considered for parking provided it is suitably hidden from the street;

(c) No parking or manoeuvring should be permitted in required yards, except in below-grade structures;

(d) Personal safety and security should be integral to the design of parking facilities;

(e) Parking and loading should be accessed from secondary streets and lanes, not primary streets;

(f) Curb cuts should be minimized by combining parking and loading access and by creating shared access to neighbouring buildings;

(g) Loading and outdoor storage areas should not be visible from primary streets. They should be located to the rear of buildings or within internalized service courts, or suitably screened from view; and

(h) Loading and outdoor storage areas should also be screened from views from adjacent residential areas, and from the Central Valley Greenway and SkyTrain alignments.

4.16 Building Depth (and Width)

(a) Individual building depths or widths that exceed 30.5 m (100 ft.) should be physically separated into a series of buildings, or be designed to appear as so. The aim is to create identity, rhythm and variety;

(b) Additional width or depth may be considered where the proposal demonstrates visual interest;
(c) Where the need for longer, wider buildings can be demonstrated, consideration should be given to elements which break up the scale of building form. Examples include: functional elements (such as stairwells, elevator and mechanical cores); entrances; facade articulation; glazing; canopy and shading systems; and upper floor connections (transparent bridges and walkways);
(d) Where possible, views should be provided into interior courtyards to assist in breaking up the mass of a large building;
(e) Massing should be articulated to minimize shade and shadow of interior courtyards and of the public realm; and
(f) On sites over 61 m (200 ft.) in width, public pedestrian linkages through the site should be considered.

5 Architectural Components

5.1 Roofs and Chimneys

(a) Rooftop mechanical systems, elevator penthouses, vents and other appurtenances should be minimized, clustered and integrated with the architectural treatment of the roofs and screened with materials compatible with the building and precinct character;
(b) Roofs should be designed and/or landscaped to be attractive as seen from above as well as from ground level. Due consideration should be given, in the design of significant landscaped roof areas, to maintenance and irrigation needs; and
(c) The use of roofs for roof gardens and roof decks to increase the usability of roofs is encouraged, particularly where buildings are stepped and roofs are accessible to adjacent interior space.

5.3 Entrances, Stairs and Porches

(a) Main building entries should be clearly identifiable and accessible from the street, and should provide generous weather protection; and
(b) Atria and open or glazed staircases of generous width are encouraged to facilitate pedestrian movement and interaction between levels, including parking levels.

5.5 Exterior Walls and Finishing

(a) The use of mirrored or highly reflective glass is discouraged to allow views into building activities, especially at grade level;
(b) Exterior building design should reflect the industrial character of the precinct by utilizing high-quality, durable materials;
(c) Exterior materials that are encouraged (but are not limited to) include:
   (i) contemporary metal cladding systems and painted corrugated metal cladding;
   (ii) heavy timber structural elements;
   (iii) glass and steel; and
   (iv) architectural concrete, especially high volume fly-ash mixes; and
(d) Stucco and vinyl are discouraged as primary exterior materials.
Photos of Architectural Characteristics

Break up large buildings into a series of buildings

Use atria to interconnect floors

Active street edge with weather protection

Landscaped courtyards between building elements
Building Entrance Treatments
5.7 Lights
Exterior lighting should be used to ensure safety and security, and to focus attention toward site and architectural features.

(a) Street lighting should be in accordance with Engineering Services standards and requirements, with a consistent and integrated system used throughout the high-tech precinct;
(b) Site lighting should confine the spread of light to within a development's property boundaries. Fixtures should be oriented away from public view. Lighting should be sited and specified so as to minimize direct glare impact on adjacent properties, surrounding streets and nearby residential developments. The use of concealed sources is encouraged;
(c) Short-masted and local area lighting is preferred over high-mounted, general site lighting;
(d) Pedestrian pathway lighting should be configured to primarily illuminate walking surfaces;
(e) Landscape lighting is encouraged to enhance the landscape design. The uplighting of trees, the backlighting of walls to silhouette trees, and the underbrush lighting of groundcovers are all exemplary treatments;
(f) Accent lighting of prominent site features, such as ponds, fountains and works of arts, is also encouraged;
(g) Entrances to buildings and dramatic multi-storey interior spaces should be illuminated to enhance their visibility and significance after dark; and
(h) Building and landscape lighting should be provided to augment street lighting and to illuminate off-street public areas such as entry plazas.

5.8 Signs

(a) Signage should be consistent and integrated throughout multi-building, campus-like developments to signify entrances and facilitate wayfinding;
(b) A building's signage should be incorporated into its architectural design; and
(c) Retail signage should be incorporated in or near the canopy, visible from the sidewalk and street, and of high quality materials.
Signage Possibilities
7 Open Space

7.1 Public Open Space

(a) Open space intended for public use should be clearly identified and designed as such;
(b) Crime Prevention Through Environmental Design (CPTED) principles should be incorporated; and
(c) Security fences should be: designed to improve the visual landscape of the street, consistent with the design and high-quality materials of the building, and complementary to the landscaping. Chain link fencing, particularly along street-facing edges, should not be permitted.

7.2 Semi-Public Open Space

A unified system of paving, furniture, signage, lighting, and plant material should be used throughout each development.

(a) The use of public art and historical references is encouraged; and
(b) Crime Prevention Through Environmental Design (CPTED) principles should be incorporated.

7.4 Greenways and Bikeways

Direct public connections through sites should be provided where appropriate to facilitate access to the city’s greenway and bikeways routes.

(a) Sites adjacent to greenways should seek to enhance the public's enjoyment of the greenway by providing adjacent landscaping and by screening out service, parking and storage activities; and
(b) To ensure the safe movement of pedestrians and bicycles, clear sight lines along greenway routes should be preserved, particularly at intersections and vehicular entrances.

8 Landscaping

(a) Landscape treatment of the street edge should include double rows of street trees along both primary and secondary streets, one row in the boulevard area and a second inside the property line in the yard setback area. The setback area should be further planted with understorey shrubs or groundcovers;
(b) Existing trees of quality should be retained where possible;
(c) Use trees of sufficient caliper (minimum 75 mm) and height to create a reasonable impact when planted;
(d) Co-ordinate species and spacing of street trees to provide a unified treatment;
(e) In paved areas, the street trees should be planted in structural soil at a minimum depth of 1.0 m;
(f) Concrete tree grates should be utilized as per the City standard;
(g) All street tree plantings should be to Park Board and Engineering Services standards; and
(h) A layered landscape treatment (using elements such as fencing, trellises, and plantings) should be provided to screen loading areas and any permitted surface parking lots, while still providing strategic visual access to signs, entries and access areas.
Public Realm and Streetscape Images
Appendix C:

CD – 1 (402) Zoning and Development By-law

Great Northern Technology Park CD – 1 (555 Great Northern Way)  
Land Use and Development Policies and Guidelines
CD-1 (402)

555 Great Northern Way
By-law No. 8131
(Being a By-law to Amend By-law 3575, being the Zoning and Development By-law)

Effective November 30, 1999
(Amended up to and including By-law No. 8574, dated October 22, 2002)
Section 1 is not reprinted here. It contains a Standard clause amending Schedule D (Zoning District Plan) to reflect this rezoning to CD-1.

Definitions
Words in this By-law shall have the meaning assigned to them in the Zoning and Development By-law, except as follows.

Live-Work Use means the use of premises for both a residential unit and a non-residential use which is associated with and forms an integral part of the residential unit.

High-Tech and Light Industrial Uses means the research, development, assembly and manufacturing functions of high-technology industries including, but not limited to, computers, software, telecommunications, bio-medical technologies, multimedia, film post-production, scientific and control instruments, and energy and environmental technologies, as well as these light industries: batteries manufacturing, brewing and distilling, electrical products or appliances manufacturing, paper products manufacturing, printing and publishing, public authority use, public utility, radio communications station, storage warehouse and wholesaling—Class A.

Uses
The area shown included within the heavy black outline on Schedule “A” shall be more particularly described as CD-1(402), and the only uses permitted within the outlined area, subject to approval by Council of the form of development and to such conditions, guidelines and policies adopted by Council, and the only uses for which development permits will be issued are:

(a) Child Day-Care Facility;
(b) Cultural and Recreational Uses, but not including Casino—Class 1, Casino—Class 2, Golf Course or Driving Range, Marina, Riding Ring, Stadium or Arena, and Zoo or Botanical Garden;
(c) High-Tech and Light Industrial Uses;
(d) Live-Work Uses;
(e) Machinery or Equipment Manufacturing, existing as of July 27, 1999;
(f) Office Uses;
(g) Parking Uses;
(h) Retail Uses, but not including Gasoline Station—Full Serve, Gasoline Station—Split Island, and Vehicle Dealer;
(i) Service Uses, but not including Animal Clinic, Auction Hall, Bed and Breakfast Accommodation, Body-Rub Parlour, Drive-Through Service, Funeral Home, Laundry or Cleaning Plant, Motor Vehicle Repair Shop, Motor Vehicle Wash, Repair Shop—Class B, Restaurant—Drive-In, and Sign Painting Shop;
(j) Storage Yard, existing as of July 27, 1999;
(k) Accessory Uses customarily ancillary to the above uses;
(l) Interim Uses not listed above and Accessory Uses customarily ancillary thereto, provided that:
(i) the Development Permit Board considers that the use will be compatible with and not adversely affect adjacent development that either exists or is permitted by this By-law;
(ii) the Development Permit Board is satisfied that the use can be easily removed and is of low intensity or low in capital investment;
(iii) the Development Permit Board is satisfied that there is no risk to the public from contaminated soils either on or adjacent to the subject site; and
(iv) development permits are limited in time to periods not exceeding three years.

Note: Information included in square brackets [ ] identifies the by-law numbers and dates for the amendments to By-law No. 8131 or provides an explanatory note.
4 **Sub-Areas**

The district shall comprise four sub-areas approximately as illustrated in Diagram 1 below.

![Diagram 1. Sub-Areas](image)

5 **Floor Area and Density**

5.1 The total gross floor area for all uses combined must not exceed 321,282 m².

5.2 The total floor area for uses listed in Table 1 must not exceed the totals set opposite such uses, and any use permitted in section 3, but not listed in Table 1, is not limited by this sub-section 5.2.
Table 1

<table>
<thead>
<tr>
<th>sub-areas</th>
<th>1</th>
<th>2</th>
<th>3A +3B combined</th>
<th>3B only</th>
<th>Maximum Total Floor Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Tech and Light Industrial Uses; Office Use, but limited to Information Technology; and Service Uses, but limited to Laboratory, Photofinishing or Photography Laboratory, Production or Rehearsal Studio and Work Shop; Accessory uses</td>
<td>66 505 m</td>
<td>30 040 m</td>
<td>224 737 m</td>
<td>-</td>
<td>321 282 m</td>
</tr>
<tr>
<td>Office Uses, but not including the offices of accountants, lawyers and notary publics, nor the offices of real estate, advertising and insurance, nor travel and ticket agencies</td>
<td>3 009 m</td>
<td>5 408 m</td>
<td>4 7323 m</td>
<td>-</td>
<td>55 740 m²</td>
</tr>
<tr>
<td>Office Uses, but limited to the offices of accountants, lawyers and notary publics, and the offices of real estate, advertising and insurance, and travel and ticket agencies</td>
<td>-</td>
<td>571 m</td>
<td>5 003 m</td>
<td>-</td>
<td>5 574 m</td>
</tr>
<tr>
<td>Retail; Service, but not including Hotel and Laboratory</td>
<td>-</td>
<td>1 619 m</td>
<td>14 174 m</td>
<td>-</td>
<td>15 793 m</td>
</tr>
<tr>
<td>Live-Work Uses</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16 722 m</td>
<td>16 722 m</td>
</tr>
<tr>
<td>Hotel</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9 290 m</td>
<td>9 290 m²</td>
</tr>
</tbody>
</table>

5.3 The following will be included in the computation of floor area:

(a) all floors having a minimum ceiling height of 1.2 m, both above and below ground level, to be measured to the extreme outer limits of the building.

5.4 The following will be excluded in the computation of floor area:

(a) balconies or sundecks associated with units in live-work use and any other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, provided that the
total area of all such exclusions does not exceed eight percent of the live-work use floor area being provided;
(b) patios and roof gardens associated with units in live-work use, provided that the Director of Planning approves the design of sunroofs and walls;
(c) the portion of a floor used for heating and mechanical equipment or other uses similar to the foregoing;
(d) the portion of a floor used for off-street parking, loading, and bicycle storage that, for each parking area, is at or below the base surface;
(e) areas of undeveloped floors which are located above the highest storey or half-storey and to which there is no permanent means of access other than a hatch;
(f) storage space associated with units in live-work use provided that where space is located at or above the base surface, the maximum exclusion shall be 3.7 m² per dwelling unit;
(g) amenity areas associated with units in live-work use, provided that the total area excluded, which is at or above the base surface, does not exceed 1 000 m² or 10% of the total commercial live-work floor area;
(h) amenity areas accessory to industrial and office uses, provided that the total area excluded, which is at or above the base surface, does not exceed 6 000 m²;
(i) childcare facility areas;
(k) where exterior walls greater than 152 mm in thickness have been recommended by a Building Envelope Professional as defined in the Building By-law, the area of the walls exceeding 152 mm, but to a maximum exclusion of 152 mm thickness, except that this clause shall not apply to walls in existence prior to March 14, 2000. [8169; 00 03 14]

5.5 The Director of Planning may permit the following to be excluded in the computation of floor space ratio:
(a) enclosed balconies associated with units in live-work use, provided that the Director of Planning first considers all application policies and guidelines adopted by Council and approves the design of any balcony enclosure, and provided further that the total area of all open and enclosed balcony or sundeck exclusions does not exceed four percent of the commercial live-work floor area being provided.

5.6 The total floor area in each sub-area for the uses listed in Table 2 must not exceed the applicable totals set opposite such uses, but any use permitted by Section 3 but not listed in Table 2 is not limited by this Section 5.6.

Table 2 - Maximum Floor Area Totals

<table>
<thead>
<tr>
<th>Use</th>
<th>Sub-Area (from Diagram 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live-Work Use</td>
<td>16 722 m²</td>
</tr>
<tr>
<td>Hotel Use</td>
<td>9 290 m²</td>
</tr>
</tbody>
</table>

5.7 The maximum number of units in each sub-area must be set out in Table 3 below.

Table 3 - Maximum Number of Live-Work Residential Units

<table>
<thead>
<tr>
<th></th>
<th>Sub-Area (from Diagram 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Number of Units</td>
<td>250</td>
</tr>
<tr>
<td>Maximum Number of Units</td>
<td>0</td>
</tr>
</tbody>
</table>
6 Height
The maximum building height, but excluding the mechanical penthouse and roof, must be as shown in Diagram 2.

![Diagram 2. Maximum Building Heights](image)

7 Parking

7.1 Off-street parking must be provided, developed and maintained in accordance with the applicable provisions of the Parking By-law, except

(a) manufacturing, office, laboratory, production or rehearsal studio, utility and communication, transportation and storage, wholesale, and work shop uses must provide a minimum of one space for each 57.5 m$^2$ of gross floor area and a maximum of one space for each 37.0 m$^2$ of gross floor area, and

(b) live-work uses, must provide a minimum of one space for each unit of 75 m$^2$ or less of gross floor area, 1.3 spaces for every dwelling unit over 75 m$^2$ for gross floor area and one additional space per 12 dwelling units on sites with 12 or more dwelling units.

7.2 The requirements of Section 7.1 may be relaxed by the Director of Planning

(a) in accordance with Section 3.2 of the Parking By-law, and

(b) on the advice of the City Engineer, in accordance with Section 4.1.9 of the Parking By-law.

8 Loading
Off-street loading must be provided, developed and maintained in accordance with the applicable provisions of the Parking By-law, except that:

(a) live-work uses must provide loading as determined by the Director of Planning in consultation with the City Engineer.

9 [Section 9 is not reprinted here. It contains a standard clause including the Mayor and City Clerk's signatures to pass the by-law and certify the by-law number and date of enactment.]
By-law No. 8131 being a By-law to amend By-law No. 3575 being the Zoning & Development By-law

The property outlined in black (-----) is rezoned:
From I-3 to CD-1

RZ Area 555 Great Northern Way

City of Vancouver

Amended to By-law No. 8574
October 22, 2002
GREAT NORTHERN TECHNOLOGY PARK
CD-1 GUIDELINES
(555 GREAT NORTHERN WAY)

Adopted by City Council November 30, 1999
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<td>10 Crime Prevention through Environmental Design (CPTED)</td>
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<td>11 Phasing</td>
</tr>
</tbody>
</table>
1 Application and Intent

1.1 Application
These guidelines should be used in conjunction with the Great Northern Technology Park CD-1 By-law for 555 Great Northern Way to guide development of the area. As well as assisting the development permit applicant, the guidelines will be used by City staff in evaluating proposed developments.

The guidelines will assist the design of individual developments to ensure compatibility with the overall urban design concept and principles for the Great Northern Technology Park and development on adjacent lands.

An illustrative plan (see Figure 1) is included for general guidance as to site, parcel and open space layout. It also indicates an acceptable form of development, recognizing that other more detailed designs showing alternative forms of development, which may also meet the objectives and intent of these guidelines, will follow during the development application stages. Variations may be considered where they fully maintain the intent of these guidelines and the illustrative plan, and the overall urban design.

1.2 Intent
The intent of these guidelines is to:

(a) Assist in the creation of an attractive, cohesive, high amenity, urban, high-tech industrial park.
(b) Integrate existing and future greenways, and pedestrian and bicycle connections.
(c) Enhance the False Creek Flats' importance as an industrial area, particularly for new and future industries.
(d) Achieve development with a high quality of urban design and architecture.

1.3 Site and History
The Great Northern Technology Park site consists of 10.7 ha (26.5 acres) of land in the False Creek Flats. It is bounded by Great Northern Way to the south and by a rail yard to the north (Burlington Northern Santa Fe Railway). On the property to the east is a new development containing facilities for a biotechnology company. To the west is a series of smaller, irregular-shaped parcels of land, vacant or with low buildings. These parcels are in the I-3 High Technology District and may be redeveloped with high-tech industrial uses, as is the rail yard and Industrial Avenue properties to the north.

The high-water mark of the former False Creek tidal flats ran across the site until the 1910s, when the flats were filled in. Some cutting has also occurred at the western end, rendering the site essentially level in grade. China Creek emptied into the mud flats at the eastern end and is now contained within a culvert in an easement across the site. The mouth of Brewery Creek was near the western end of the site.
2 Urban Design Principles

Great Northern Technology Park is organized around a new, east-west spine road or "central avenue," with an open space near the western end. New north-south streets are also proposed across the site connecting Great Northern Way with Industrial Avenue.

Key urban design principles guiding the pattern of development are:

(a) integrating the development with the city by (i) generally extending the adjacent street grid and encouraging pedestrian and visual connections, but discouraging through traffic into adjacent residential areas, and by (ii) having a well planned transit strategy;
(b) creating a strong sense of place and identity by reinforcing existing features, such as the landscape buffer along Great Northern Way, and by adding new features and amenities appropriate for a high-tech industrial park;
(c) providing a mixed-use form of development which integrates non-industrial uses into the fabric of the development and effectively serves the needs of the high-tech businesses and the worker population;
(d) providing a high degree of amenity for workers and visitors;
(e) creating a distinctly urban form of development with well defined, animated, landscaped streets with mainly underground parking;
(f) providing a grain of building units and massing typical of an inner-city location;
(g) extending and establishing pedestrian and bicycle routes through the site, to provide both connections for the city-wide Greenways Plan and links to local neighbourhoods;
(h) providing open space on the site, including a central green space as a distinctive feature of the public realm;
(i) providing commemoration of the site's former natural setting as the terminus of Brewery Creek and southern shoreline of the tidal flats, with the opportunity for future daylighting of Brewery and China creeks;
(j) varying building heights across the site to preserve northward views from Mount Pleasant street ends and lessen view impacts for residential developments south of Great Northern Way.

3 Site Considerations

3.1 Siting

The location of streets, open spaces, development parcels and buildings should generally be as described in the illustrative plan shown in Figure 1, recognizing that other plans showing alternative
forms of development may also meet the objectives and intent of the CD-1 By-law. Buildings are to be organized to define streets and to form a vertical and horizontal built-form edge.

### 3.2 Setbacks

(a) Provide a 9-m (30-ft.) setback along Great Northern Way to preserve and enhance the existing landscape buffer.

(b) Provide a 15-m (50-ft.) landscape setback along the westerly and easterly most property lines to be reserved for the potential future daylighting of China and Brewery Creeks. Landscape the Brewery Creek setback with a theme that commemorates the former creek.

(c) Parking or loading access is not to be located in the above landscape setbacks.

(d) Provide a 1.5-m (5-ft.) setback from the northern and southern property lines of the central avenue to give a wider pedestrian area of about 3.5 m (11.5 ft.) for the greenway, while allowing street activities (e.g. terraces, sidewalk cafes, shop display, vending). Consideration will be given to asymmetrical street cross-sections which provide a wider sidewalk area along the northern building edge to take advantage of greater sun exposure.

(e) Generally, building setbacks along the central avenue, beyond the required 1.5 m (5 ft.), are discouraged to create a continuous streetwall, except when they serve a useful function such as articulating a long facade, demarking an entranceway or providing additional space for outdoor seating or display, particularly along the northern edge where greater sun exposure may be achieved.

(f) When buildings are set back from streets, the landscape and architectural design should suitably maintain the continuity of the streetwall or street edge through the use of low walls, fences, mass plantings, paving treatments, etc.

### 3.3 Topography

Historically, the site sloped down from the south to the shoreline edge of a tidal flat. Today the site is essentially flat, reflecting the tidal flat, with a rise along Great Northern Way, where the shoreline used to be. Some cutting did occur along this edge and it is proposed to be filled in again. The new development will establish the higher existing grades along the Great Northern Way property line as base grades and slope gradually across the site to the north and to the east, meeting the lower existing grades. This filling will generally be limited to the western end of the site where the grade differential exists.

The inclusion of a below-grade ALRT line on the site will have further implications for the final grades within the site and to the north of the site. If ALRT is included, more detailed review of topographic grades will be entailed in the planning and design of the system. Regardless of what is built, the following guideline applies:

(a) Any significant alterations of existing grade should support convenient pedestrian access to property, reflect the natural slope of the land and help visually integrate building massing (and ALRT components) into the landscape.

### 3.4 Building Orientation

Buildings on properties which abut the central avenue should front this road.

### 4 Vehicular Access, Off-Street Parking and Loading Areas

#### 4.1 Parking Facilities

(a) All off-street parking should be generally located below grade. Some interim surface parking may be permitted on sites of future phases of development, subject to landscaped setbacks and acceptable access points as determined by the Director of Planning in consultation with the City Engineer.

(b) No parking or maneuvering is permitted in landscape setbacks.

(c) Above-grade parking may be considered where the site slope is conducive to such a layout or if the design of the parking structure is sensitive to its streetfronting conditions. On pedestrian-oriented streets, like the central avenue, above-grade parking should be concealed
behind areas containing active uses other than parking, such as building lobbies or retail services.

4.2 Loading Areas

(a) Loading areas should be located within buildings or to the rear of buildings away from active streets. Access to these loading areas should be from lanes or side streets, and is discouraged from the central avenue.
(b) Loading areas should be effectively screened from view of surrounding public spaces, neighbouring properties and from the overlook of nearby residential developments, using architectural elements, such as fencing and trellises, and plant material. Screening and concealing of service and loading functions is especially critical for buildings which abut the landscape setback along Great Northern Way.
(c) Loading docks and garbage bins should not be visible from the street.
(d) Outdoor storage of goods is discouraged. When necessary, outdoor storage should be incorporated into well screened loading areas.

4.3 Parking and Loading Access

(a) Where possible, access to parking structures and loading areas should be from lanes or side streets. If located along the central avenue, parking and loading should be combined into one entrance and its width should minimize interruption to the streetwall.
(b) Shared parking and loading entrances are encouraged for abutting properties.
(c) No insulation, piping or mechanical equipment is to be visible from the street unless dealt with in an architectural manner.

5 Architectural Characteristics

5.1 Building Height and Views

(a) Building height limits are described in the By-law. Height limits vary across the site from 13.7 m (45 ft.) to 45.7 m (150 ft.).
(b) In addition to the limits described in the By-law, northward street-end views from St. George, Carolina, and Fraser streets should be preserved by restricting heights to 13.7 m (45 ft.) in 40-m (131-ft.) wide corridors, as shown in Figure 2. These street-end view corridors should be aligned with the centre lines of the St. George, Carolina and Fraser street rights-of-way, south of East 5th Avenue.

Figure 2 - Street-end View Corridors
5.2 Massing and Form
(a) Building massing should be broken up into smaller units that allow views through blocks or into courtyards. In blocks which approximate the scale of the existing subdivision pattern to the south, at least one break in the massing should occur and preferably more. In longer blocks over 180 m (591 ft.) in length, at least two breaks should occur and preferably more.
(b) Avoid long, continuous building forms and instead express the individual functional components of a large building complex as a series of interconnected or interrelated massings. Create identity, rhythm and variety.
(c) Respect the incremental rhythm of Vancouver streetscapes typical of mixed-use areas around the downtown.
(d) Shallow articulation of surface elements and materials is generally ineffective in achieving adequate variation in the massing and bolder manipulations of the form should prevail.
(e) Generic building designs that exhibit little facade interest or transparency should be avoided.

5.3 Building Entrances
(a) Main building entrances should be clearly identifiable, visible, transparent and accessible from the street.
(b) Pedestrian interest and comfort should be provided at entrances through specifically designed seating, signage, lighting and features that signal the building's use.
(c) Consider atrium spaces with staircases as a means to connect floors and effectively tie the entrance with the upper levels.
(d) Where possible, internal courtyards and landscaped areas should be visible from the street.

5.4 Articulation
(a) Architectural design should be expressive of the building structure and environmental design considerations. Functional elements, such as stairwells, elevator and mechanical cores, and entrances, should be used to break up the horizontal scale of the building form.
(b) Building materials should be carefully chosen to break up the horizontal scale and accent edges for pedestrian interest.
(c) Glazing with high clarity should be used to encourage visual connections between inside and out. The use of highly reflective glazing is discouraged.
(d) Where street frontages consist of retail and service uses, they should reflect a smaller, more intimate scale and be clear-glazed to enhance openness and pedestrian interest.
(e) Design elements which contribute to energy efficiency and animate facades should be encouraged.

5.5 Weather Protection
(a) Main building entries should provide generous weather protection that is designed to be an integral feature of the building's architectural character.
(b) Building frontages along the central avenue should include canopies for weather protection.
(c) Weather protection should be considered over walkways which connect interrelated buildings, as an amenity consistent with a campus-like environment.
(d) Canopies and awnings should be built of durable materials, and consideration given to lightness and translucency.

5.7 Skybridges
(a) Pedestrian bridges may be considered between the upper floors of related buildings when easing circulation, facilitating the movement of equipment and enhancing security are important aspects of a building program.
(b) Skybridges may not cross over City streets, except that they may be considered for the secondary rights-of-way, subject to designs acceptable to the General Manager of Engineering Services and the Director of Planning.
(c) Skybridges should have a high degree of transparency to allow views through.
5.8 Materials
(a) A consistent palette of materials should be used throughout the high-tech park.
(b) In general, all commercial-grade exterior finishing materials and details appropriate to local climatic conditions may be utilized, provided they contribute to:
   (i) a high-quality image that portrays a sense of permanence; and
   (ii) to the long-term durability of the exterior system, such that its initial integrity, quality, and visual appearance will be retained over the lifespan of the building.
(c) Materials and treatments at grade level, particularly for buildings fronting the central avenue, should present visual and textural interest at a pedestrian scale.

5.9 Roofs and Mechanical Penthouses
(a) Roofs should designed to be attractive as seen from above as well as from ground level. Large, monotonous expanses of roof should be avoided.
(b) Vents, mechanical rooms and equipment, elevator penthouses, and other rooftop devices should be integrated into the roof architectural treatment or should be grouped and screened with materials and finishes compatible with the building.
(c) Mechanical penthouses and screening enclosures should not cover more than 25% of the roof area or project more than 6 m (20 ft.) above the maximum building height. They should be oriented with the longer dimension in a north-south direction to minimize view impacts to residential developments to the south.

6 Open Space and Streetscapes
6.1 Structural Overview
A hierarchy should be established for the open space system from the public-owned and freely accessed spaces, like the street rights-of-way, to completely private and inaccessible building courtyards. In between are privately owned spaces to which the public may have some degree of access, such as the landscape setbacks. Open space is an important element which will impart the park-like ambiance desired of the high-tech campus and is one of the principal amenities sought by the worker population and the surrounding neighbourhoods. Some general guidelines for open space planning include:

(a) The landscape should be used as a unifying element for the high-tech park with a consistent system of materials and detailing used throughout.
(b) Open space planning and design should consider the neighbourhood context and the needs of Mount Pleasant residents, as well as those of employees (and residents) of the site.
(c) Open space intended for public use should be clearly identified and designed as such. It should have sufficient openness to be inviting and safe for the public.
(d) Greenway connections provide an important pedestrian link to and from the site.

6.2 Streetscape Design
The streets should be designed and built in accordance with Engineering Services standards and requirements. A unified system of paving, furniture, signage, lighting and plant material should used throughout the high-tech park site, with the central avenue being an area designated for special paving, lighting, furnishing and planting treatments. There are four types of streetscape treatments, as follows:

(a) Great Northern Way — Great Northern Way is to be reconstructed as a broad, landscaped boulevard with three signalized intersections, one at each end of the site and one at the centre. A landscaped median is to run its length except where there are left-turn bays for the intersections.
(b) "Central Avenue" — This central east-west spine road is a newly created street which is intended to be the internally focussed "main street" for the high-tech park. It will contain most of the building entrances and addresses, and be the focus of the retail activity. It will therefore be designed to be traffic-calmed, and pedestrian and bicycle friendly. Because the central avenue is to support much of the pedestrian activity in the high-tech park, it should have a greater level of detailing and more richness of materials in its streetscape design. The central avenue is an area designated for special paving, lighting and planting treatments.

The design of the western portion of the central avenue should be integrated with the design of the adjacent open space and with the proposed ALRT station, such that design themes, functional relationships, materials and finishes are all coordinated. Likewise, the intersection and corner plazas proposed in the middle of the site should be well integrated with the design of the central avenue.

Asymmetrical cross-sections for the central avenue will also be considered to allow for wider sidewalks on the northern building edge to take advantage of greater sun exposure.

(c) Primary North-South Streets — The primary north-south streets will connect to Great Northern Way with signalized intersections and provide access to the central avenue with future extensions to Industrial Avenue. These north-south streets are to have 20-m (66-ft.) wide rights-of-way, except for the most easterly one which may require a wider right-of-way to serve as a main connector with Industrial Avenue and to accommodate bikeway routes.
(d) **Secondary North-South Rights-of-way** — The secondary north-south rights-of-way will be 12.2-m (40-ft) wide, and will provide public pedestrian and bicycle access. Vehicular movements may also occur in these rights-of-way for access to parking and service areas, potentially with right-in/right-out access to Great Northern Way.

6.3 **Landscape Setbacks**

(a) **Great Northern Way** — In the 9-m (30-ft.) wide setback along Great Northern Way existing mature trees should be retained where possible. Selection and placement of new plantings should enhance the existing character. A sidewalk or pathway should be provided along the length of the setback and consideration should be given to designing the path to be suitable for in-line skating, in its width, material, alignment and grade. Outdoor amenity areas, such as patios, may be provided in the setback area to meet the needs of adjacent developments, providing that landscape screening is maintained between such areas and Great Northern Way.

(b) **China Creek** — The 15-m (50-ft.) wide China Creek easement should be given a soft landscape treatment that is in keeping with the overall theme of the high-tech park but that also considers plant materials indigenous to local riparian environments. The landscape design should allow for future daylighting and not include large trees that would have to be removed. When public access to the north can be achieved, a pedestrian pathway should be provided along its length, with consideration given to bicycle and in-line skating access if feasible.

The easement should provide a landscape feature for the adjacent developments which should open onto it in a positive manner. The interface between the development and the easement should be sensitively shaped by terracing and stepping of the building massing, avoiding large expanses of blank wall.

(c) **Brewery Creek** — The landscape design of the 15-m (50-ft.) wide Brewery Creek setback should commemorate Brewery Creek in a manner which is in keeping with the commemorative initiatives in the IC-3 District. It should present an attractive overlook for adjacent buildings. A pedestrian pathway should be provided along its length, with consideration given to bicycle and in-line skating access if feasible.

6.4 **Central Open Space**

The final configuration of the central open space should have a net area approximately equivalent to that originally proposed in the CD-I, whether or not an adjoining ALRT station is built. (4 937 m² or 1.22 acres was proposed.) The design of this space should:

(a) maintain the primacy of the central open space as a key feature in the planning and design of the tech park;
(b) be open and inviting for the public;
(c) treat the central open space as an “urban room” that is flexible and serves multiple user groups, including workers, visitors and local area residents;
(d) set an example of high civic design as a benchmark for future development in the area;
(e) integrate water as a primary element and recognize the historic, cultural and environmental qualities of China and Brewery creeks;
(f) ensure safety and security by allowing for natural surveillance and guardianship from surrounding businesses and residents, and through the use of appropriate materials and equipment;
(g) incorporate diversity through the use of distinctive landscape materials and design;
(h) consider materials, i.e. plants, furnishings and lighting, that are long-lasting and durable;
(i) maximize opportunities for users to enjoy the open space in inclement weather, for example, through dry pathways, fast-drying benches and shelters.

The central open space should be well integrated with its surroundings by:

(j) recognizing four walls to the park formed by the surrounding building facades and by a strong wall edge formed by the adjoining ALRT station, should it be built;
(k) creating strong connections into the central open space from gateways, along approaching streets and from the surrounding building edges;
(l) incorporating the open space into the surrounding walking and bicycling systems.

6.5 Private and Semi-Private Open Spaces

(a) Provide clear distinctions between public and private open spaces through the use of defined access points and edges, circulation systems, grade changes and the use of plant material, architectural elements and fencing.
(b) Enhance the park-like character of the high-tech park by permitting a high degree of visual, but not necessarily physical, access into private landscaped spaces (yards and courtyards) through the use of openings in the building form, iron picket fencing, overlooks, etc.

6.6 Plant and Landscape Materials

(a) Use trees of sufficient caliper (minimum 75 mm) and height to create a reasonable impact when planted.
(b) Incorporate seasonal and coniferous planting.
(c) Avoid planting only one species of plant material except in special circumstances.
(d) Use permeable materials and natural drainage processes, including channelling, ponding and percolation.

6.7 ALRT Station and Environs

If an ALRT Station is included adjacent the central open space, the following design considerations apply.

(a) Provide clarity in the relationship between the transit structure and the elevations of the street, platform and track levels.
(b) Ensure that above-grade station elements contribute positively to the urban design of the tech park (and conversely, that the below-grade elements are buried and out of sight).
(c) Allow for mixed uses at the ALRT station for a better interface between the station and the open space by giving opportunities for transit riders to pause and linger.
(d) Minimize grade changes between the street, the central open space and the station entry.
(e) Ensure a clear distinction, or hard line, between the station area and the adjoining open space, and ensure that there is no erosion of the proposed amount of open space throughout the station's design and implementation.
(f) The station should have a presence at the urban scale, complimenting the park and surrounding buildings.
(g) The station should be a strong design solution. It should be open, transparent, welcoming, safe, bold and well lit at night.
(h) The station should be organized around three spatial elements, as shown in Figure 6:
   (i) The east end as a visual focus along the central avenue looking west.
   (ii) The centre as the station body, with visual and physical access.
   (iii) The west as an interface between the central open space and the main pedestrian entrance.
7 Lighting
Exterior lighting should be used to ensure safety and security, and to focus attention toward site and architectural features.

(a) Street lighting should be in accordance with Engineering Services standards and requirements, with a consistent and integrated system used throughout the high-tech park.
(b) Site lighting should confine the spread of light to within a development's property boundaries. Fixtures should be oriented away from public view. Lighting should be sited and specified so as to minimize direct glare impact on adjacent properties, surrounding streets and nearby residential developments. The use of concealed sources is encouraged.
(c) Short-masted and local area lighting is preferred over high-mounted, general site lighting.
(d) Pedestrian pathway lighting should be configured to primarily illuminate walking surfaces.
(e) Landscape lighting, such as uplighting of trees, backlighting of walls to silhouette trees, underbrush lighting of groundcover, is encouraged.
(f) Accent lighting of prominent site features, such as ponds, fountains and works of art, is also encouraged.
(g) Entrances to buildings and dramatic multi-storey interior spaces should be illuminated to enhance their visibility and significance after dark.

8 Signage

(a) Signage should be consistent and integrated throughout the high-tech park.
(b) A building's signage should be incorporated into its architectural design.
(c) Retail signage should be incorporated in or near the canopy, visible from the sidewalk and street, and of high-quality materials.

9 Environmental Considerations

9.1 Trees and Vegetation

(a) Where possible, existing trees and vegetation should be retained and protected along Great Northern Way, and incorporated into the site planning.
(b) A variety of native trees and vegetation should be provided to minimize maintenance, water use and integrate the planting design into the traditional landscape character as much as possible.

9.2 Water

(a) Permeable surfaces should be maximized to reduce stormwater runoff and recharge groundwater.
(b) Consider on-site management of stormwater runoff.
9.3 Soils
Topsoil should be retained, where possible, to provide a rich basis for site planting and landscape development.

9.4 Air Quality and Transportation
(a) Walking and bicycling should be encouraged by linking development to adjacent bikeways, greenways and other pathways.
(b) Convenient, safe and accessible pedestrian and bicycle connections should be provided to major bus and SkyTrain routes.

9.5 Energy
(a) Buildings should be oriented to maximize solar orientation, taking into consideration building placement and planting design.
(b) Building materials, systems and construction methods should be considered to conserve energy and reduce long-term operating costs.

9.6 Solid Waste
(a) A comprehensive waste management plan should be considered among landowners that can provide recycling and reuse in close proximity by the various industrial, retail and high-tech uses.
(b) Recycling facilities should be provided for each development.

9.7 Green Design Objectives
Sunshine, light, cross-ventilation, and recycled materials should all be considered in the design of buildings.

10 Crime Prevention through Environmental Design (CPTED)
The design of Great Northern Technology Park will take into consideration the principles of CPTED appropriate to an industrial and office environment. Each development proposed for the site, and the design of the public realm, should be subject to a CPTED review. If an ALRT station is included on the site, particular attention should be paid to incorporating CPTED principles into its design and into the design of the adjacent open space.

11 Phasing
The development will occur in phases. Measures should be taken to ensure each phase is completed and usable for business.