

**RESILIENT CLUSTERS: CONNECTING HIGH-TECH
CLUSTERS TO RESILIENCE THINKING USING
CRESTWOOD CORPORATE CENTRE AND YALETOWN**

by

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ABSTRACT

This research project explores the connections between economic development and sustainable land use planning. It brings forward the idea that to create cities that are resilient to coming crises such as climate change and resource depletion, coordinated economic development and land use development is needed. The purpose of the project is to determine what principles of urban development will create a resilient cluster, an area that is attractive to high-tech firms and matches the principles of smart growth, a set of principles for sustainable land use development. It analyzes and compares two case study areas in Metro Vancouver: Yaletown and Crestwood Corporate Centre, where I determine the important factors needed to attract high-tech firms while also finding connections with the aspects of smart growth needed to create more resilient clusters. I argue that economic development and land use development can have sustainable and resilient results when coordinated.

Key words: Resilience, Resilient cities, Sustainability, Smart growth, Clusters, Land use planning, Urban economic development, Urban planning.

Subject terms: Resilience, Resilient cities, Smart growth, Land use planning.

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1: INTRODUCTION

Over the course of the 20th century, North American cities experienced rapid growth and prosperity, with many seeing major expansion of their local economy and increasing standards of living through higher incomes. In the coming decades, cities will be faced with a multitude of issues that will challenge their ability to continue this age of prosperity that citizens have come to expect, issues that will seriously challenge their ability to survive. While the 20th century was a time of seemingly endless economic growth for citizens in North American cities, ahead lies a future of rapidly depleting resources, most notably fossil fuels, that allowed our cities to experience such fantastic growth. In addition, the unknown costs of climate change will further challenge our cities' ability to continue developing in the way accepted by most to be the norm.

Development patterns of the past century have focused on a rapid decentralization of land use, including a strong push towards suburbanization. In the future, scarcity of resources such as fossil fuels will lead to substantially increased energy costs (Dixon, 2006, 2008; Kunstler, 2005), and many scholars have noted that this decentralized and suburbanized land use pattern is inefficient when it comes to energy use and other resource allocations (Alexander and Tomalty, 2002; Roseland, 2005; Norman, McLean and Kennedy, 2006; Litman, 2009; Condon, 2010 to name a few). Furthermore, current land use patterns have received attention as a significant source of green house gas (GHG) emissions, both from transportation as well as general energy use, which only further complicates our need to substantially reduce our GHG emissions to help avoid climate change (Roseland, 2005;

Norman, McLean and Kennedy, 2006; Condon, 2010). As these major issues become more evident and difficult to ignore, the costs associated with current development and land use patterns will only increase the negative ramifications for our cities. As such, it is vital to the success of cities that we move beyond current forms of development.

Over the last decade, there has been much talk about moving towards more sustainable urban development. However, sustainability is often argued to be an abstract term, and can seem to have a myriad of definitions, which can make it difficult to envision exactly what sustainable urban development would look like. Furthermore, one could possibly argue that sustainability is about sustaining the life North Americans currently have. This could lead to cities looking for ways to maintain current development patterns when in reality these contribute to the problem. Instead, we can view cities in the context of urban resilience, that is, creating development patterns that will help us overcome a reliance on cheap energy, and help mitigate some of the contributing factors to depleting stocks of resources and climate change. The idea of resilience comes from ecosystems thinking. Ecosystems that experience serious shocks require adaptation, by the ecosystem, as well as the organisms within it. The better an ecosystem can cope with such shocks, the more resilient it is¹. Without such adaptation, the ecosystem can collapse. Ecosystems that survive such shocks are often called resilient, a term that essentially means the ability to survive trauma or crisis while maintaining a recognizable shape and function (Walker and Salt, 2006; Newman and Jennings, 2008; Newman et. al. 2009).

¹ Originally used by C.S. Holling, ecosystem resilience represents the capacity of a system to experience disturbance and still maintain its ongoing functions and controls. In this sense, Holling states that we can measure resilience by the magnitude of disturbance that can be experienced without the system “flipping” into another state (Holling and Gunderson, 2002)

The idea of resilience can be applied to cities and used to describe the way cities can approach a variety of issues they face. If we consider cities as ecosystems themselves, then a resilient city is one that can survive the trauma caused by a severe shock. I would argue that issues such as the depletion of resources, higher energy costs, and climate change will challenge the very basis of cities' existence, and we can view these issues as the shocks that could cause the collapse of an ecosystem (Kunstler, 2005; Dixon, 2006). As such, current development and land use patterns have made our cities more vulnerable to these particular "shocks", and therefore will play a part in their potential collapse. This need not be the case. There are alternative development patterns that are less vulnerable to such shocks and make our cities more resilient.

One of the most highly touted alternative forms is that of smart growth style development. Smart growth provides us with an example of land use and development patterns that are different from what we have seen over the past decades. While there is no standard definition or set of principles for smart growth (see section 3.2), almost all iterations that are used in practice put a focus on compactness, mix of uses, and alternative forms of transportation. Smart growth is often considered an alternative form of urban development that is more resource efficient compared to more urban sprawl, and can provide positive impacts on the liveability² of a city while achieving many positive environmental, social and economic goals (Curren and Leung, 2000; Alexander and Tomalty, 2002; Litman, 2009). Using these principles as a foundation, smart growth

² Liveability or quality of life is an often used term with no firm definition. As Ley (1990) points out, urban quality of life can mean very different things to different income groups. Ley gives the example of liveability in the middle class context, with a focus on a healthy environment and attention to arts and culture, and inner city residents or poorer class, with a focus on job and housing security and access to quality public services. For the purposes of this paper, when I use the term liveability or quality of life, I am referring to liveability that crosses income levels, with a focus on job and housing security, the access to public services, a healthy environment, etc. I will not address the inherent conflict within the current liveability discourse that appears to focus more on middle class issues than those of the poor.

represents a good framework that can be used to create a more resilient city. It is often argued that current development patterns, however, are the more economically beneficial (Portney, 2003; Condon, 2010), and even when alternative forms of development are considered, the relationship between economic development and land use planning can be ignored (Condon, 2010). Having a strong local economy, more specifically, a good supply of well paying employment opportunities, is part of every city's list of development objectives. In the future, however, objectives related to the local economy must also consider the implications of climate change and depleting resources, and incorporate the idea of resilience into their planning in a similar way to that of land use planning. As such, to achieve a more resilient city, a more resilient urban form is required, and understanding the role that economic development plays is essential.

Exploring what more resilient forms of land use development would entail is the focus of this paper. More specifically, I will investigate whether or not a more resilient form of development, such as one based more closely on the principles of smart growth, cannot only help our cities survive the coming crises, but can also achieve many of the same benefits current development patterns have and are viewed as necessary to have strong economic development. To do this, I use the example of the high-tech industry, which is considered to be a key industry for the post-industrial city, with much effort being put into developing and attracting firms within that sector. Using the sector as my example, I will examine two case studies to attempt to shed light on the necessary components for cities to create locations that high-tech firms would find attractive, but that also create locations that help them move to a more resilient land use and development pattern. While low density, suburban style development patterns such as

office parks may not represent resilient forms of land use or development in the way that smart growth can, the question of whether or not such developments are better suited for high-tech firms places cities in a difficult situation. Can developments such as office parks be avoided by altering our current development patterns to attract high-tech firms, while achieving the economic advantages and the necessary resource efficiencies and GHG reductions that allow a city to be more resilient? The purpose of this paper is to help shed light on this question, and begin to understand how cities can create high-tech clusters³ that can move cities towards more resilient land use patterns while maintaining the economic advantages that make them attractive to firms. The objectives for this paper are to determine (1) what components are important to effectively attract high-tech firms; (2) what components of a city's land use development and planning strategy can help create more resilient clusters of high-tech firms; and (3) some of the different barriers and opportunities for resilient cluster development depending on the current land use structure and pattern a city or locality currently possesses. Through meeting these three objectives, I provide a policy relevant definition of a resilient cluster. As such, the results of this paper will represent initial findings that can help us rethink how we approach land use planning and economic development in hopes of leading us to the more resilient city.

³ By clustering, I am referring to the spatial cluster of firms in close proximity, but not clustering as specifically defined by cluster theory. Clustering theory is addressed in section 3.3.

2: OUTLINE

This paper will compare two case studies, each one representing a different style of development: the neighbourhood known as Yaletown in Vancouver, BC, and an office park located in the neighbourhood of East Cambie in Richmond, BC, known as Crestwood Corporate Centre. To examine these two case studies, I have created a conceptualization of the components needed to create a resilient cluster. I argue that such a place needs to have a more resilient land use pattern, but is also planned and designed in such a way as to provide locational components that are seen as attractive for high-tech firms. The components I use to create a more resilient land use and development pattern are derived from the principles of smart growth. In addition to the principles of smart growth, I conducted research on the criteria thought to be important for high-tech firms when considering a location. Using this conceptualization, I compare Yaletown and Crestwood Corporate Centre/East Cambie. I use criteria related to more resilient land use patterns as well as location factors for high-tech firms to try and determine (1) what factors each case study has that make it more closely follow a resilient land use pattern; and (2) what locational factors each case study provides that are necessary to be attractive to high-tech firms. The goal will be to evaluate if one, both, or neither of the case studies is a more resilient cluster, to determine recommendations for Vancouver and Richmond that are specific to each case study, and finally to provide recommendations for future economic development and land use strategies. It is my opinion that while one form of urban land use and development pattern may be better able to adapt to a more resilient

cluster/development, both forms of land use have the ability to be adapted to become more resilient to the coming crises.

Before providing this conceptualization and comparison, I will examine key literature to develop my argument. First, I will examine exactly what resilience is, and how it applies to cities. This includes an examination of a city that currently demonstrates what can happen when resilience is not present in the face of major shocks to its local economy. I will then move on to an examination of literature around smart growth and urban sprawl, providing an explanation about what key principles are associated with smart growth and as well as critics who argue why sprawl is the most appropriate development pattern for the modern city. In addition, it will move into a discussion about why consideration of economic development objectives is crucial to smart growth strategies, including an examination of economic development literature, linking these ideas to smart growth. Building on this, I will then argue why smart growth, with economic development considerations incorporated, represents a more resilient form of urban development compared to traditional development, namely urban sprawl. Furthermore, I will present my argument for why economic development objectives and planning objectives need to be designed in mutually beneficial ways to create a more resilient city. Once this is complete, I provide a brief explanation as to what I mean by the high-tech sector, and how the city may play a role in attracting such firms. In addition, I include a brief discussion of why the high-tech sector represents a good example to use when examining how economic development objectives can be incorporated into planning objectives.

Upon completion of the literature review, I then outline the methodology I used to develop my conceptualization of a resilient cluster. Before providing this conceptualization, I review the local context within which each case study is found. I then move to provide the results of my data collection by reviewing each case study. I then provide my conceptualization of a resilient cluster, use it to compare and contrast with each case study, and provide recommendations. These recommendations are designed for each city, as along with long term recommendations for the planning of resilient clusters in the future.

3: LITERATURE REVIEW

3.1 Resiliency and Cities

Resilience is a term that can be used to describe the capacity to respond and adapt to moments of crisis or change. Typically, resilience is used when talking about ecosystems, and the ability for an ecosystem to survive changes that occur within it or to it (Dixon, 2006; Walker and Salt, 2006; Newman and Jennings, 2008). Essentially, resilience is the capacity of a system to absorb disturbances and still retain its basic function and structure (Walker and Salt, 2006; Newman and Jennings, 2008). When an ecosystem is not resilient, these disturbances can cause severe trauma and lead to collapse. Using this definition, we can apply the idea of resilience to a variety of systems, including human settlements, such as cities. For example, Jared Diamond explains that settlements and societies have collapsed when they did not adapt to current circumstances, and undermined their natural resources and environment, ensuring their destruction (Diamond, 2005). Such collapse does not have to come from a compromised resource base, but could also refer to the collapse of a local economy unwilling to adapt. For example, if a local economy were to be completely reliant on a single item for export, should this export lose value or become obsolete, that particular local economy would experience trauma. This would present a situation to test that economy's resilience, where it would either adapt and perhaps transition to a more diverse economic base or new export, or collapse, unable to transition in the face of such trauma. The city of Detroit provides a good example of such a situation. The economic success the city

found in the second half of the 20th century was due to its strong automobile manufacturing sector. Over time however, the city became completely reliant on this industry for its economic health, and when shocks to that sector occurred, such as the increase in fuel costs and pressures from other automobile manufacturing companies elsewhere in the world⁴, there was a sharp decrease in demand for automobiles manufactured in Detroit. The city saw a drastic increase in the unemployment rate and the city and the local economic base began to erode (Okrent, 2009). The complete reliance on one sector has caused (and continues to cause) serious economic hardship for local citizens, despite the US federal government attempting aid in the recovery of that sector⁵ (Okrent, 2009).

As the city's economic base was eroding, the city itself was experiencing massive population loss paired with further disinvestment. After World War II, America's major industrial cities experienced an abrupt end to over a century of rapid population and economic growth. Robert Beauregard argues that this can be attributed to the rapid conclusion of a period of urbanization that favoured concentration rather than decentralization (Beauregard, 2006). During the pre-WWII period, cities continually grew in population but did so through increased densities. Following WWII, a period of distributive growth (where all cities grew in population) through concentration was replaced with a parasitic growth that saw a rapid shift to decentralization and the expansion of the suburbs. The growth of the suburbs caused aging industrial and central

⁴ A 2006 consumer report found that American's 10 most preferred cars were all of Japanese make (Noe, 2006)

⁵ Following the near bankruptcy of Detroit's major car manufactures, the US government committed billions of dollars to bail out the companies to help prevent further job loss and economic hardship (see Sanger, Herzehorn and Vlastic, 2008). Prior to this, the Clinton administration provided \$100 million in funding to seven empowerment zones, one of which was in Detroit. This funding was designed to promote economic development and reinvestment (Empowerment Zone Development Corporation, 2002). Despite these and other investments, Detroit continues suffer economically.

cities to experience serious trauma. This was due to the fact that suburban growth was parasitic, where population increases there led to massive losses in older centers. The reasons for this included great innovations in transportation, an increased market for suburban land, and a maturing real-estate industry that was able to spur investment in the suburbs (Beauregard, 2006). As these areas continued to suck investment out of older central cities, higher levels of government failed to invest in the existing infrastructure in these areas, causing further population exodus to the suburbs. The federal government's construction of highways exacerbated the problem by disrupting existing neighbourhoods and allowing for easier commutes from suburban municipalities to the downtown core. This led to further disinvestment and an eventually cyclical process of population loss, disinvestment, and job loss which caused further population loss. Housing values and rents decreased, retail sales continued to fall, and the tax base was continually eroded, making it difficult for cities like Detroit to stop the bleeding. Today, major portions of Detroit are abandoned, leaving behind empty buildings and decaying infrastructure (Okrent, 2009). The rapid decentralization of land use certainly played a role in Detroit's inability to respond to the haemorrhaging auto manufacturing sector.

Moving forward, as we begin to take seriously the effects of our greenhouse gas (GHG) emissions on climate change, the depletion of fossil fuels such as oil and other resources and increasing energy prices, cities which are unable or unwilling to adapt will find themselves in similar situations to that of Detroit. When looking to alter approaches to development, there has been a focus on creating cities that are more sustainable, or focusing in sustainable urban development. While sustainability is an important concept, looking to approach development in a more holistic manner by focusing on the economic,

environmental, and social impacts of development (see Roseland, 2005 for example), I believe that the crises we are about to face require us to approach alternative forms of development with a greater sense of urgency. Resilience thinking is the idea that we focus on preparing to maintain the basic functions of a system (such as a city) in the face of shocks. This will allow us to more narrowly focus on preparing to mitigate and adapt to crises. I believe we need to move towards resilience thinking when we build our cities, so we will be more prepared to deal with the new human-made shocks associated with climate change, resource depletion, etc. The ability to respond to resource shortages, as well as the recognition of the city's contribution to climate change (and responding to the effects it will bring), are what will define the resiliency of our cities, and beginning to approach all aspects of development with resilience in mind will also us to begin moving towards cities of resilience (see for example, Newman et. al, 2009).

The development patterns and the built form of most of our cities take on a land use pattern that will be ineffective in dealing with these disturbances and in most cases will contribute to the problem. Most North American cities are dominated by low density, resource intensive and energy inefficient forms of development, relying almost solely on the car as a mode of transportation. As such, new forms of urban development are required to help mitigate the serious environmental issues cities will face in the coming decades, but also to provide a more resilient urban space that can adapt in a world with limited resources and high energy costs.

Smart growth, as a form and pattern of urban development, is an often cited example of a style of development that has a lower environmental impact and allows for more efficient use of energy and resources (Alexander and Tomalty, 2002; Litman, 2009;

Roseland, 2005; Condon, 2010). In terms of economic development, however, cities using smart growth as a planning framework often ignore the implications of economic development on their eventual goals and outcomes. Economic development is an integral aspect of urban development overall, and incorporating its objectives into a city's planning framework, especially one based on smart growth, can have mutually beneficial effects. I would argue that smart growth is a more resilient form of urban development than decentralized, low density development, also known as urban sprawl. Additionally, a city's development patterns along with economic development outcomes become more resilient when using a smart growth framework that incorporates economic development objectives.

The next section examines what smart growth means, how it applies to urban development, and the various arguments both in favour of smart growth, but also those in favour of the low density development, or urban sprawl, that dominated the latter half of the 20th century. It also examines why economic development planning should be incorporated into smart growth planning, and why and how this may be beneficial for both smart growth and economic development goals.

3.2 Smart Growth

Smart growth, as used by urban planning officials, aspires to act as a response to the congestion, environmental degradation, and loss of community that many argue are caused by urban sprawl (Alexander and Tomalty, 2002; Litman, 2009; Condon, 2010). The definition of smart growth, however, is perplexing, with no standard definition well accepted by everyone. There are two categories that smart growth can be divided into: growth management strategies, and planning strategies that focus on the design of

communities. Within these two categories is a variety of possible principles that can be considered part of the smart growth mantra.

At the heart of the smart growth movement is the goal of reducing urban sprawl. According to smart growth advocates, the current design and development patterns of cities have severely negative environmental impacts with both local and global implications (Alexander and Tomalty, 2002; Litman, 2009). Of particular importance is that current practices focus on low density, dispersed development of commercial, industrial, and residential land uses. This low density, dispersed development, or sprawl, when coupled with high government expenditures on roads and highways, promotes the personal automobile while discouraging any other form of transportation (Litman, 2009; Condon, 2010). In contrast, smart growth communities are meant to be compact with high densities, have a mix of land uses, and be designed with multiple forms of transportation in mind (Curren and Leung, 2000; Alexander and Tomalty, 2002; Litman, 2009; United Nations Human Settlements Programme, 2009). In doing so, not only can the negative impacts of urban sprawl be avoided, but the quality of life for residents within such communities is argued to increase (Curren and Leung, 2000; Alexander and Tomalty, 2002; Litman, 2009). To achieve this, there are principles that cities should follow to create smart growth communities. While there are no universal principles of smart growth, several ideas are prevalent throughout the literature. Below are what I would argue to be some of the most prevailing principles found throughout the literature, along with various benefits that are argued to come along with them.

3.2.1 Compact Development

As opposed to the more diffuse development pattern in traditional 20th century communities, smart growth communities should focus on creating a more compact neighbourhood (Curren and Leung, 2000; Litman, 2009; United Nations Human Settlements Programme, 2009). This can be achieved by increasing densities of all land uses. In addition, new development that occurs should be directed to existing communities (infill development) (Curren and Leung, 2000). Compact development, when focused on infill as opposed to development on the outskirts of the city (green field development), and coupled with increased densities, allows for more efficient use of land (Alexander and Tomalty, 2002; Litman, 2009). Efficient use of land is thought to reduce the pressure to convert green space to urban areas, thus protecting valuable habitat and farmland, but also is more energy and resource efficient (Alexander and Tomalty, 2002; Litman, 2009), which can play a major role in helping reduce GHG emissions. In addition, compact development reduces car use by promoting shorter commuting distances due to higher densities (Roseland, 2005; Condon, 2010). When paired with a mix of uses in close proximity, it can also increase walkability and reduce car use further (Alexander and Tomalty, 2002). Along with this, higher residential densities provide more economically efficient opportunities for public transportation (Alexander and Tomalty, 2002; Roseland, 2005; Condon, 2010). Residential land uses should be designed to provide a variety of housing types to ensure there is a better balance of citizens from different stages of life or economic backgrounds (Alexander and Tomalty, 2002). Fundamental to the compact community is also the idea that they be built to a “human scale” to increase walkability (Curren and Leung, 2000; Alexander and Tomalty, 2002).

More basic benefits include greater efficiencies in the provision and use of hard infrastructure such as roads and sewage systems, which can be costly and require large amounts of energy and raw resources to construct, further contributing to GHG emissions (Alexander and Tomalty, 2002; Norman, McLean and Kennedy, 2006). Kriegar (1999) argues that smart growth helps address the fiscal demands of expanded urban development, as it helps tackle the increasing fiscal pressure on municipal budgets to provide the range of services and infrastructure required for any given area by promoting more efficient use of both.

3.2.2 Mix of Land Uses

Smart growth communities should have a variety of land uses, including ample residential and commercial spaces, but also green or recreational space (Curren and Leung, 2000; Alexander and Tomalty, 2002). Residents who live in compact communities need to have access to daily amenities and employment opportunities. Having a mix of uses may also encourage a better balance of residents and jobs, which in turn can also decrease the need to drive (Alexander and Tomalty, 2002; Condon, 2010). Alexander and Tomalty (2002) argue that not only do smart growth communities provide amenities and employment opportunities; they can provide a greater clientele and employee base for many businesses due to higher residential densities. This in turn can further increase the desire for a mix of land uses. By providing a mix of uses in as close proximity as possible to rapid transit stations, public transit ridership can be increased, along with walkability, as transit stations would provide access to riders' needs (Calimente, 2009).

3.2.3 Provide a Variety of Transportation Options

Not only are smart growth communities to provide a variety of options, but they are to have a greater emphasis on public transportation, walking, and cycling so as to reduce the need for the car (Curren and Leung, 2000; Litman, 2009). As a whole, lessening the need for the car helps alleviate urban traffic congestion, which is not only a major economic issue in urban areas, but also an environmental problem (Alexander and Tomalty, 2002). Reduced car use helps reduce green house gas emissions and air pollution, as well as decreases the need for oil within the city (Newman and Kenworthy, 1999 ; Roseland, 2005; Newman et. al., 2009; Condon, 2010). Over the past several decades, many North American cities have experienced increasing commuting times due to traffic congestion (mainly caused by automobiles), with many organizations and governments specifically acknowledging the serious economic costs that result (Transport Canada, 2006). Rather than attempting to mitigate the issue of congestion by increasing road capacity⁶, smart growth approaches to planning seek to provide alternative forms of transportation, as well as using built form to help reduce the need for long distance commuting (i.e. compact and mixed use approaches described earlier). By providing viable alternative forms of transportation in partnership with more walkable communities, smart growth can help alleviate traffic congestion while also providing more affordable commuting options (Litman, 2009; Condon, 2010). In addition, by reducing single occupancy vehicle traffic, costly expansions to road infrastructure can be avoided, helping reduce municipal budgets (Kriegar, 1999).

⁶ The BC Provincial Government has committed billions of dollars to its “Gateway Program” for infrastructure that it believes will alleviate traffic congestion, such as a new and expanded Port Mann Bridge connecting the Burrard Peninsula to Surrey (Province of BC, 2010)

While these three principles of smart growth described in the beginning of the section may appear attractive, there are some critics who believe smart growth is in fact inferior to the current development patterns we have today. In fact, some argue “sprawl” is a superior form of urban development.

3.2.4 Low Density Development/Urban Sprawl and Criticisms of Smart Growth

While smart growth is thought to produce many positive impacts, there are many critics who counter the claim that smart growth style development is a beneficial form of urban development. Critics such as Robert Bruegmann argue that sprawl in actuality has received a bad name, and that it is in fact a superior form of development. According to Bruegmann (2006), urban sprawl can receive some credit in America’s remarkable growth during the 20th century, due to the fact that the increased availability of land, decreased home prices (and other land prices), and road and highway expansion allowed for the tremendous growth in the automobile sector, increasing the wealth of the nation while also providing increased accessibility to citizens. In response to claims that sprawl causes congestion, Bruegmann argues that it is not sprawl that has caused congestion, but rather rapid population growth coupled with the restrictive road and highway expansion (Bruegmann, 2006). Furthermore, the rapid growth of the suburbs over the latter half of the 20th century demonstrates the desirability of suburbia (Bruegmann, 2008). According to Bruegmann, the decentralization of urban life has been occurring for centuries, and it represents the natural evolution of cities as wealth increases. The automobile, like the horse and carriage before it, allowed citizens to increase their mobility, thereby opening up new, and cheaper, lands for the increasing middle class (Bruegmann, 2008). Alexander and Tomalty highlight that at least in the B.C. context, the vast majority of

municipal expenditures on transportation are given to road infrastructure, and argue this can account for much of the unequal mode split between cars and transit (Alexander and Tomalty, 2002). Whether or not this is a reflection of the demand for such infrastructure, or the bias towards car related infrastructure, is still up for further debate.

Bruegmann (2008) and Cox (2003) both argue that increasing densities does little to improve congestion, and instead promotes an increase in congestion and commute times. As stated earlier, Bruegmann argues that congestion has increased due to poor infrastructure investments in roads, and, like Cox, argues that increasing densities will only increase congestion. This is because the car is still the preferred choice of transportation, and despite trying to encourage people to take public transit, there will not be a significant decrease in car use (Bruegmann, 2006, 2008; Cox, 2003). Cox (2003) claims that there is ample evidence that increased densities increase traffic congestion, due to the fact that per capita travel by car does not decrease by a high enough percentage, and that “adding more of anything to a constricted space...increases crowding” (Cox, 2003). Litman (2009) counters this claim, stating that it ignores the many features of a smart growth community beyond just density that have an impact on car use, including more travel options, and decreased travel times.

Anthony Downs (2005), while not an outright critic of smart growth, does highlight the fact that smart growth policies have been known to increase housing prices, rather than decrease them. This is largely because of restrictive land use policies that limit the land supply, and as demand goes up, the lack of supply can cause prices to increase (Downs, 2005). The idea of limiting the supply is one that is often targeted by many smart growth critics, who claim that it not only causes an increase in prices, but it

limits citizens' choice of where they want to live (Cox, 2003). Proponents of smart growth, however, argue that these increases in prices reflect the desirability of these communities, and such price increases can be ameliorated by increased densities and decreased unit size (Alexander and Tomalty, 2002; Filion, & McSpurren, 2007; Litman, 2009). Lee et. al. (2008), using the example of Vancouver and its EcoDensity policy, argue that increasing densities does very little to ameliorate the decreasing affordability of neighbourhoods. As evidence, they state that many Vancouver neighbourhoods have significantly increased their density over the past several decades, but affordability has continued to decrease, both in terms of housing purchase prices and rental rates. They agree that this is due to the increased attractiveness of these areas, but argue that if a higher level of affordability is to be achieved, the government needs to take a more direct approach, such as using inclusionary zoning to ensure the construction of non-market and market rental housing in new developments, which could then be managed by the government or an NGO (Lee et. al, 2008). It is worth noting that Lee and colleagues agree that smart growth style developments that promote a denser living have many benefits, such as enhancing livability, ensuring greater energy efficiency, greater utilization of transit, walking and biking as alternative transportation modes, and more robust public and private goods and services in the local neighbourhood. They also argue, and rightfully so, that if affordable options for middle and lower income earners are not provided, such citizens or families have little choice but to move to more affordable communities, often located in auto-oriented suburbs, thereby countering many of the environmental benefits associated with smart growth (Lee et. al, 2008).

While smart growth represents a departure from the low density development patterns of North American cities over the latter half of the 20th century, we need to discuss a key component of city planning that generally is not included or coordinated with objectives like the ones we get from smart growth. Economic development objectives play a crucial role in any city, and more importantly, they will play a crucial role in the more resilient city of the future. Next I discuss why and how smart growth and economic development can and should be coordinated, and why this coordination/integration is beneficial for urban resilience.

3.3 Smart Growth and Economic Development

There is no question that cities devote well deserved attention to economic development, as having a strong local economy that provides high quality employment opportunities is fundamental to a city's success. As such, economic development strategies and objectives are almost always designed to ensure an adequate base of employment (Portney, 2003). Often, however, economic development objectives such as attracting a particular industry sector, are not coordinated with planning objectives (Ronderos, 2009); economic growth is good for growth's sake, instead of economic growth being seen as a means to an end. This can be particularly evident when comparing cities that on the one hand are pursuing what they claim to be more sustainable urban development (such as smart growth), but then on the other hand locating their employment opportunities in a seemingly contradictory location, often only accessible by highway (Condon, 2010). In Metro Vancouver, the regional government and its member municipalities have promoted the idea of more sustainable urban development, with a focus on more compact, mixed use growth around public transit (see section 5.1). Despite this, there has been significant

office development and growth in suburban areas, in auto-oriented office parks outside of the region's designated growth areas (Royal LePage Advisors, 2001). For a variety of reasons, this need not be the case. According to Portney (2003), sustainable cities should manage their economic growth and development to be more consistent with their vision of what kind of city or community they want. In fact, I argue that partnering economic development with planning strategies like smart growth can have many mutually beneficial outcomes. Each broad objective can benefit from one another when properly coordinated.

Economic development, or more specifically, the location of employment opportunities, is a fundamental component that should be included in the creation of a land use pattern similar to any smart growth style development. Many of the objectives, such as compactness, walkability, and attractive alternative transportation options, can deeply depend on access to employment opportunities to maximize the chance for success. Included with all of these objectives is the idea of creating communities with a high quality of life. To expand on this, communities and cities need to tie economic development with the quality of life objective. Whatever economic development occurs within a city should be consistent with the vision for that city, as unmanaged growth can cause urban sprawl, wasted and deteriorating infrastructure that is under utilized, and a waste of natural and human resources (Portney, 2003). In terms of tying this to smart growth objectives, jobs need to be located close to homes to truly promote a mode shift away from the automobile. This is particularly true if one objective of a city is to lower GHG emissions, as is now a legislated requirement in British Columbia⁷. While many

⁷ The Province of BC legislated that all municipalities must now incorporate green house gas emissions reductions targets into their official community plans as per Bill 27 and the Provinces Climate Action

industries or sectors can be located in more efficient buildings, the savings in emissions and energy can be offset by increased VKT (vehicle kilometres travelled) when located in far flung office parks (Condon, 2010). Despite efforts to coax people out of their cars and onto transit, more often than not transit systems are designed with an assumption that the jobs are located at or near the urban core, when in reality there has been significant job growth on the periphery (Royal LePage Advisors, 2001; Condon, 2010). Even the best transportation systems cannot hope to provide an alternative to the car when so many jobs are clustered around highways located far from where employees live. If cities want to take seriously the goal of shifting people's mode of transportation, then it is vital for us to solve the jobs/housing challenge.

As discussed earlier, for most of the last 50 years, cities and city regions have developed with decentralized land uses, which has led to a separating of jobs and housing. What this pattern assumed was that that fuel (i.e. oil) is unlimited and has no environmental consequences, and when faced with congestion, we can simply build more roads to deal with it (Condon, 2010). This is proving to be an incorrect assumption, and if we want to create a more resilient city, we need to accept that this segregation of where we work and live cannot continue. Instead, we can now recognize that there are many reasons why and how we can integrate residential land uses with those that provide good employment. For one, we should recognize that while some cities in North America still maintain some heavy manufacturing, almost all job growth has come from sectors that can easily be integrated into residential neighbourhoods (Condon, 2010). In addition, because of post-industrial development changes, cities can now create job sites that don't

require as much space. For example, as cities sprawled, many new job sites took shape as one and two storey office buildings clustered together in office parks (Anderson, 2000, Condon, 2010, Ronderos, 2009, Young 1995). Because these were often built near freeways, with the assumption that everyone would drive, they were surrounded with overly large parking lots, with large green spaces mixed in to help beautify an obviously unattractive landscape (Condon, 2010). Now, with the shifts in the economic base of many cities, we can integrate job sites into residential communities, avoiding the phenomenon of low density, sprawling areas that cannot be properly served by transit. If these areas are located near other land uses, then it will become easier to provide public transit options, as there may be a critical mass of homes nearby or other uses that provide a destination for other transit users beyond just employees of local firms (Condon, 2010). This will require some changes to how cities approach zoning, but falls in line with, and helps move towards, the objectives of smart growth.

But better achieving the goals that work towards creating smart growth communities is not the only benefit of integrating economic development. In addition, the economic development objectives can also receive many benefits of being integrated into a smart growth style community, with certain sectors seeing more benefits than others. There has been considerable research completed that has shown a relationship between proximity and economic development and or competitiveness. Alfred Marshall (1890) included a chapter in his book *Principles of Economics* on the concentration of specialised industries in particular localities. Marshall states that this local concentration of specialized activity can be examined in the context of a triad of external economies: the ready availability of skilled labour, the growth of supporting and ancillary trades, and

the specialization of different firms in different stages and branches of production (Marshall, 1890).

Today, a prominent idea in relation to economic development and proximity is in relation to the spatial clustering of firms. Michael Porter, who is often credited as one of the major proponents of “cluster theory”, argues that firm competitiveness is based on a “competitive diamond” of four sets of factors: firm strategy, structure and rivalry; factor input conditions; demand conditions; and related and supporting industries (Porter, 1990). Porter (1990) argues that the more developed and intense the interactions between these four sets of factors, the greater the productivity will be of the firms involved. Porter then goes on to argue that the intensity of these interactions can be enhanced if the firms are also clustered, that is to say, in close proximity to one another. According to Porter (1990) “the process of clustering, and the intense interchange among industries in the cluster, also works best where the industries involved are geographically concentrated” (p. 157). This means that, at least according to Porter, clusters can exist in many forms, but the more geographically concentrated, the more competitive the cluster and the firms within it will be.

Martin and Sunley (2003) criticize Porter and his cluster theory, as they believe the definition of what constitutes a cluster is far too broad⁸, and that the theory jumps to conclusions that are unsubstantiated. Furthermore, they argue that just because there is an association between some high-growth industries (citing examples that Porter gives) and various forms of geographical concentration does not mean that this concentration is the main cause of their economic success (Martin and Sunley, 2003). Rather, Martin and

⁸ For example, the size of a cluster could possibly range from anywhere between 1 - 1000 acres.

Sunley (2003) state that “the empirical case for clustering remains in its infancy and repeatedly makes the mistake of jumping from particular associations to general causality and applicability” (p. 29). It is important to note, however, that Martin and Sunley’s critique is not meant to attack the ideas of proximity and economic development, but rather, Porter’s cluster theory itself. They challenge the idea that cities should simply replicate successful examples of clustering, but rather should focus on local context specific methods of encouraging similar developments, and that further research needs to be conducted to determine to what extent spatial clustering increases economic competitiveness.

At the very least, proximity allows for the exchange of knowledge and ideas, which arguably allows for increased innovation and acts as a competitive advantage. Furthermore, Jacobs (1969) explains that the crucial externality in cities is the cross fertilization of ideas between various firms and lines of work, allowing for ideas to be shared between groups that otherwise may not normally provide knowledge formally (i.e. through attending career advancement seminars, providing a manual on how to undertake a given task, etc.). Firms from a diverse range of industries (e.g. computer software and garment industries) would not usually participate in such formal activities with one another, yet according to Jacobs, a city’s ability to promote firms to locate within close proximity allows for informal interaction and the exchange of knowledge to occur (Jacobs, 1969). Often, traditional development patterns not only encourage various firms to locate away from other land uses, but similar firms in a sector begin to locate in the same area. A smart growth style community encourages a mix of uses, which would include a mix of firm type, perhaps better promoting this chance of cross fertilization. In

addition, Glaeser et. al. (1992) highlight the importance of cities and their ability to allow for knowledge spillovers, that is, positive externalities that occur when knowledge, such as an innovation in manufacturing, is shared between neighbouring firms who do not necessarily pay for it⁹ (Glaeser et. al. 1992). This exchange of knowledge is thought to occur due to the increased face to face contact that occurs when firms and employees locate in close proximity. Storper and Venables (2004) speak of the notion of “buzz”, the idea that areas and atmospheres that promote interaction and face to face communication can be particularly important in sectors of the economy where information is imperfect, rapidly changing, and not easily codified (exchanged in a formal sense).

Cities often encourage proximity between related firms to provide them with these advantages. This may help explain why high-tech firms, for example, locate in office parks with other similar firms, and why cities in turn provide them. Office parks built in low density, green field developments also provide a source of cheap land and office space while still providing them with the economic advantages of agglomerations. But more dense cities themselves can act as economic development devices. Not only can cities act as dense networks of diverse groups of people and amenities, allowing for the constant interaction and sharing of ideas (i.e. developing human capital), but their vibrancy and ability to provide attractive lifestyle amenities can increase their liveability, acting as a magnet to a group of people with large quantities of human capital (This idea will be further examined in Section 3.5 when I discuss the high-tech sector specifically).

As such, I would argue that smart growth can further enhance many economic

⁹ There are two important ways in which companies can obtain knowledge and information to advance their operations. 1) Organizations can make direct payments for tradable knowledge, such as hiring consultants or buying educational materials or attending educational events such as conferences, or 2) They can obtain tacit knowledge, that is, knowledge imbedded within employees, such as the culture of a particular firm, which can be transferred and obtained when employees move between firms.

development objectives to the benefit of the overall planning objectives of the city, and hence, should be much more closely integrated with economic development objectives. More specifically, economic development planning should aim for coordination of firms' locations, encouraging locations where job growth will occur. It should be noted, however, that geographic proximity, while important, is not the only important form of proximity. Hall and Jacob (2010), for example, highlight that other forms of proximity, such as cognitive, organizational, institutional and social, in addition to geographic proximity, play important roles in understanding how actors in maritime ports seek out innovation, upgrading, and competitiveness. While taking a more in depth look into this area of research is beyond the scope of this project, it is important for cities to consider this body of work, and not solely focus on geographic proximity when looking to accrue the economic benefits related to the notion of proximity in urban economic development.

3.4 Smart Growth and Resiliency

With the integration of economic development objectives into smart growth planning, I believe that the basic principles I outlined in section 3.2 represent a more resilient form of urban development, and a more resilient land-use pattern will result. At this point, there are several questions that need to be answered. First, why and how does smart growth, when it is coordinated with economic development, help get us to a more resilient city? The resilient city I am referring to is one that can withstand rapidly increasing energy prices, the decreasing availability of many resources, most notably oil (which will have a significant impact on energy prices as well), and is prepared to deal with the task of quickly reducing green house gas (GHG) emissions to help mitigate climate change. As stated earlier, this requires a land use pattern that promotes more efficient use of

resources and energy (heat, electricity, water, etc.), is less dependent on automobiles as a mode of transportation (i.e. reliance on oil), protects or increases green space (to protect agricultural land and habitat as well as vegetation that helps absorb GHGs), and helps achieve an overall reduction in current GHG emissions (achieved through a combination of all of the above).

Smart growth promotes compactness and a mix of uses, which is more energy efficient, decentralized development, and promotes a shift in transportation modes away from cars, be it to walking, biking, and/or taking public transit. It helps reduce the need for and use of heating fuels, decreases our use of energy and transportation fuel, all of which lead to an important decrease in our emissions. It also encourages infill development, which helps protect green space so it can be used for growing food, providing habitat, and sequestering GHG emissions. I believe creating a development pattern more similar to this will not only contribute to a more resilient city, but also a more resilient local economy that can provide the necessary employment opportunities for a city's residents. This is largely because if traditional development patterns continue, major portions of employment growth will occur on sites similar to sprawling and segregated areas such as office parks, located in areas only accessible by car, in inefficient buildings and require major and increasingly costly infrastructure expansion projects to accommodate further traffic congestion (i.e. BC Gateway Program). Governments may not be able to afford such projects, and this could lead to major issues in terms of continually accommodating areas with infrastructure necessary to continue to function, adding to the worsening infrastructure deficit in North America.

Smart growth style communities can provide an increased customer base for certain businesses, and decrease the need to use the automobile to get to a business or job, thereby decreasing the costs of transportation. In certain sectors, such as the high-tech sector, the competitiveness of the firm is based on the skilled workforce they employ. If firms do not have access to a skilled labour force, they won't locate in a particular city. If employees find it increasingly expensive, difficult and/or unattractive to get to their place of work, then they may choose to live elsewhere, and in so doing, take away chances to attract new firms to their former community, thereby potentially weakening the local economy. More importantly, when any firm locates within a smart growth style community, the planning objectives outlined earlier, and the benefits, can more easily be achieved.

While smart growth can represent a more resilient land use pattern than low density, automobile oriented urban sprawl, the second question remains: how exactly could so many of the firms we find in office parks be incorporated into smart growth style developments? What would these places look like? How we would know if they are more resilient, while still providing the economic advantages that firms seek?

The remainder of this paper focuses on the high-tech industry, trying to find if there is a more resilient way in which we can attract and retain high-tech firms; a more resilient high-tech cluster. To do this, we must first briefly examine how the high-tech sector relates to the urban environment, and must better understand the role the city can play in its development.

3.5 The High-Tech Sector, the City and Locational Decisions

Before entering into a discussion about the high-tech sector, it is important to have a rough definition of this sector. For the purposes of this paper, when using the term, I define it as any industry that is involved in the production and or dissemination of products or services related to technology intensive activities (Hutton 2008). This would include (but is not limited to) the production of hardware, such as computers, microchips, satellites, other IT related devices, etc., or software, such as videogames, GIS applications, office software applications (i.e. Microsoft, Adobe, video/computer games, etc); firms that provide internet services, including website maintenance; and firms, subsidiaries of larger firms, or branches of larger firms, that are involved in research and development, such as bio-technology. This definition of high-tech firms is broad, however, and the high-tech firms found in the two case studies used fall primarily within the category that is involved in the production of software applications and the provision of various internet services. All of these firm types are considered part of the “new economy” (Hutton, 2008), and essentially, these firms employ people that are highly educated and creative, or have high levels of human capital. Richard Florida refers to these people as the “creative class” (Florida, 2002b). While there is some debate on exactly who or what jobs fall into this category, Florida (2002b) argues that a city’s ability to attract these workers will in turn allow them to attract firms and new forms of employment in the new economy or “knowledge economy”, as these occupations are based on creativity and innovation (i.e. high-tech industries such as software and gaming).

According to Florida (2002a, 2002b), cities can compete for this highly mobile class of employees by creating vibrant and attractive communities that promote diversity and provide a variety of very attractive lifestyle amenities. He argues that this is particularly true for “highly educated, high-human-capital individuals who possess resources, are economically mobile, and can exercise considerable choice in their location” (Florida, 2002a, p. 745). Does this mean that the city itself plays a role in attracting these workers and people? Glaeser, Kolko and Saiz (2001) state that their research has found that there is a strong relationship between amenities and city growth. To this end, they argue that not only do high human capital workers (attracted by amenities) increase productivity, but areas that are high in human capital are more pleasant places to live (Glaser, Kolko and Saiz, 2001). According to them, if cities “wish to remain strong, they must attract workers on the basis of quality of life as well as on the basis of higher wages” (Glaser, Kolko and Saiz, 2001, p. 48). Furthermore, creative activities associated creative sectors like the high-tech sector are associated with imperfect and rapidly changing information. As stated earlier, Storper and Venables (2004) argue that face to face contact, or “buzz” is a benefit to these types of industries or sectors because it is a quicker and more efficient form of communication, provides psychological motivations, and can facilitate learning and socialization.

While Florida and Hutton believe that location is very important for high-tech firms, there is also some debate about what exactly high-tech firms look for in a location. Scholars such as Hutton argue that firms choose to locate in areas based on a variety of intangible values associated with given neighbourhoods, ranging from attractive amenities, areas with a strong sense of place or distinct identity, centrality to related firms

that allows for constant face to face interaction, and centrality to areas that are attractive places for their employees to reside. On the other hand, classical location theory states that firms will locate in a particular location based on the price of the rent and their ability to out price other firms (Alonso, 1960). This view is that there is a distinct and predictable pattern to where firms locate based on their ability to out bid other firms or land uses based on their need to be located closer to the central business district (CBD) (Alonso, 1960). As such, the only factor that is important in terms of locational decisions is price.

4: METHODOLOGY

This paper is designed to determine if it is possible to create a more resilient cluster, which includes more resilient land use patterns that also provide the attributes and requirements high-tech firms look for when determining a location. To do this, in addition to the literature review above, I utilized a mixed-method approach to determine the features that are important to high-tech firms when looking for a location. The main method used was twelve semi-structured interviews. These interviews were conducted with personnel from high-tech firms located in my two case study areas, commercial real-estate agents that deal directly with high-tech firms, a principal from a consulting firm who has worked on area development strategies for high-tech firms, and economic development officers and planners from the City of Richmond and the City of Vancouver. Tables 1 and 2 provide a summary of the firms or positions interviewed, using pseudonyms that will be referenced in the text.

Table 1 – Interviewees related to high-tech firms

Case Study Areas	Firm Interviewed	Pseudonym
Yaletown	Bayleaf Software	Jessica
	Third i	Mike
	HB Lanarc - Principal	Tony
	Colliers International	Carolyn
Crestwood	MacDonald, Dettwiler and Associates Ltd (MDA)	Eric
	Hypercube Technologies	Grant
	Great West Life (GWL) - Property Owner	Andrew
	HB Lanarc - Principal	Tony
	Colliers International	Carolyn

Table 2 – Interviewees related to planning and economic development

Case Study Areas	Position interviewed	Pseudonym
Yaletown/Vancouver	Senior Planner	Ian
	Vancouver Economic Development Commission	Josh
	HB Lanarc - Principal	Tony
Crestwood/Richmond	Planner	Steve
	Senior Planner	Danielle
	Economic Development Officer	Laura
	HB Lanarc - Principal	Tony

It should be noted that high-tech firms located within both of my case studies primarily fall within the production of software and provision of internet services category of high-tech firms. While the types of software developed varied between firms, and particularly between case study locations, there was little production or assembly of hardware (i.e. computers) occurring in either location. While there were some potential exceptions to this, particularly in Crestwood¹⁰, it should be noted that of the firms and other interviewees I interviewed, the prevailing focus was on firms within the software development and internet services provider category of high-tech firms. This is important to highlight, as firms with a much stronger focus on hardware production may have significantly different locational requirements, which means that any data collected in relation to locational preferences should not be extrapolated to these types of firms unless further research was to verify such claims.

In addition to interviews, I analyzed policy documents and research reports written specifically about high-tech firms and how to attract them, or those written about what high-tech firms find attractive about particular locations. I then took the information gathered from the literature, the interview respondents' answers, and the

¹⁰ MDA for example conducted some final assembly of certain components for satellites and other devices used by the firm.

policy documents and research reports, and compared/triangulated the evidence presented to build a set of criteria required by high-tech firms. I developed two explanations to distinguish between the attributes that certain types of firms look for that are unique to either Yaletown or Crestwood.

In addition to determining the needs of the high-tech firms, I also needed to develop a picture of a more resilient land use pattern that can then be paired with the locational requirements of high-tech firms. The basis for this pattern is derived from smart growth principles, but to supplement this, I also interviewed local urban planners from the City of Vancouver and the City of Richmond. Because one of the objectives of this paper is to aid better coordination of urban planning and economic development objectives, I also asked the economic development officials from each city for their views on the importance of coordinated economic development and urban planning efforts, and triangulated these results with that from the planners and the literature.

After presenting the combined data related to high-tech firm requirements, and the outline for a more resilient land use and development pattern, I then provide a conceptual overview of what a resilient cluster would look like. Once I provide this, I then use it to analyze what each case study provides in terms of fulfilling the requirements of a resilient cluster. By taking the conceptual picture and using it to analyze each case study's attributes, we are able to see whether or not a resilient cluster looks distinctly different from either Yaletown or Crestwood, and in what ways. Once this is complete, I then show each case study, and the location it represents in terms of a development pattern, in terms of both positives and negatives. This allows us to develop a better picture of what

it would take to achieve a more resilient cluster, and to provide recommendations for the case studies as well as future developments.

Before we are able to do any of this, however, it is important to discuss the context in which both case studies are situated. Thus, in the next section I begin with a review of the regional context, as well as each city's policies that impact the given case study.

5: CONTEXT

Yaletown and Crestwood Corporate Centre are located within the Metro Vancouver region of British Columbia. Yaletown is located in the city of Vancouver, the largest municipality in the metro region at roughly 600,000 people, while Crestwood is located in a suburb of Vancouver, Richmond, the third largest city in the region with a population of about 182,000 people. As a whole, Metro Vancouver has a population of roughly 2.2 million people, but is expected to experience a substantial increase in population over the next 40 years to roughly 3.4 million people (Statistics Canada, 2006, Metro Vancouver, 2009). As such, accommodating present and future populations is certainly of importance, with Vancouver and Richmond playing a significant role in absorbing this growth. Important to the context of this paper is not only this growth, but Metro Vancouver's history of attempting to manage its growth in a more sustainable manner. Before moving on to examine each case study individually, it is important to provide a brief background on Metro Vancouver, the regional government, its approaches to land use planning and its regional growth strategies. How it has attempted to manage growth provides an important background to better understand the context within which Yaletown and Crestwood's economic development and land use planning are situated.

5.1 Metro Vancouver

As stated earlier, Metro Vancouver, formerly known as the Greater Vancouver Regional District (GVRD) has a population of roughly 2.2 million people, in an area

roughly 2877 sq kms, and a density of about 735.6 people per sq km (Statistics Canada, 2006). Densities in the region vary significantly from city to city and even place to place within those cities. Urban sprawl is of significant concern in the region, particularly as the region has experienced rapid population and urban growth over the last few decades. Due to this growth, the region as a whole has a significant history in attempting to manage population growth in a coherent and regional way. The region's attempts at managing urban growth provide evidence of the recognition of the importance of protecting the natural environment and seeing its connection with helping maintain a high quality of life for residents. This is exemplified in the region's current growth management strategy, the *Livable Region Strategic Plan* (LRSP), and the new (draft) regional growth management strategy (RGS), entitled *Metro Vancouver 2040: Shaping our Future*

5.1.1 Livable Region Strategic Plan

The purpose of the LRSP was to provide the region with a unified growth strategy, one that provided the means to overcome the problems with current growth patterns that have “meant a gradual loss of available farmland and green space, reduced air quality, ever-increasing distances between where we live and work, and increasing reliance on the automobile” (GVRD, 1996, p. 6). The LRSP had four main policy directions: 1) Protect the green zone, 2) build complete communities, 3) achieve a compact metropolitan region, and 4) increase transportation choice (GRVD, 1996).

The LRSP viewed protecting the green zone as a fundamental component of protecting the region's quality of life. What is important about the LRSP's definition of the green zone is that not only does it demonstrate understanding of the importance of

these areas, but also because this green zone is to be used as the method to define the limits of urban expansion. The policy moves towards the protection of valuable habitat, agricultural land, and general green space, which is an objective outlined in most smart growth developments. Outlining which areas in Metro Vancouver are to be protected is an initial step toward an urban containment boundary. Unfortunately, due to the nature of Metro Vancouver's relationship to other cities and its lack of planning power, these designated areas cannot be protected under the LRSP.

Next, the plan focused on the creation of complete communities. According to the LRSP, the method for the region to create more complete communities is via the creation of a “network of regional and municipal town centres, which are intended to be primary concentrations of jobs, housing, and culture and recreation opportunities” (GVRD, 1996, p. 11). This network would provide residents with access to services and facilities within their communities, and allow for reduced travel distances, particularly when transit connections between these communities are improved (GVRD, 1996). Important in the context of this paper, the LRSP also states that this policy supports economic growth by promoting “an equitable distribution of jobs in balanced communities” (GVRD, 1996, p. 11). It thus promotes a mix of land uses, and the densities that can be achieved through “concentration” help promote alternative forms of transportation other than the automobile. What this policy direction lacks is firm targets for jobs, or in fact any economic development policies couched within the LRSP to encourage job growth. Without coordinated economic development, there is no guarantee of the quality of jobs in these communities. The absence of high quality jobs

could negate the objective of providing residents with the necessary components to live and work within the same community.

A “natural companion” to the complete communities is the LRSP goal of developing a compact metropolitan region (GVRD, 1996, p. 12). To achieve this strategy, a growth concentration area was identified, and consisted of the “core municipalities” (See Figure 1).

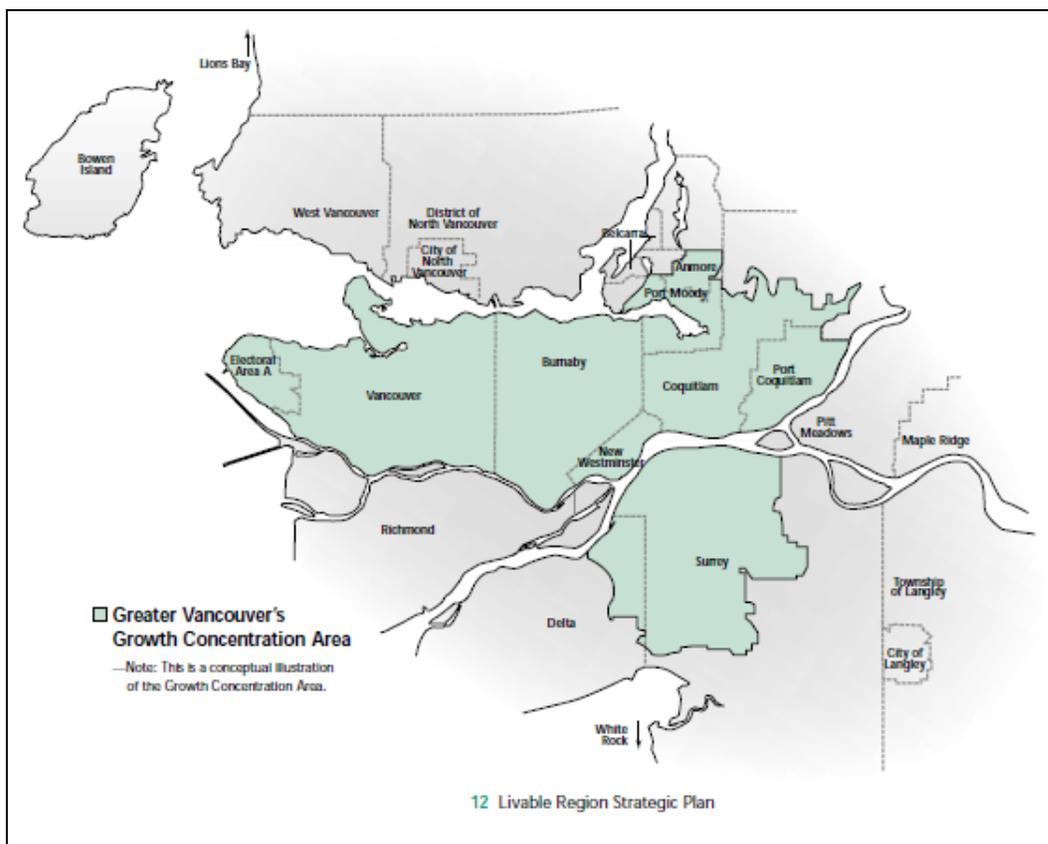


Figure 1 - Growth Concentration Area 1996 (GVRD, 1996)

The intention was to focus high-density growth into the concentration area, easing the development pressure on the outlying green zone. Concentrating growth in this area would also make it easier to provide a balance of jobs and housing in close proximity, and the high densities would support expanded transit service (GVRD, 1996), which is

the final policy direction of the plan. This policy direction helps achieve a compact urban form with higher densities that can promote alternative forms of transportation. It ties in well with the previous two policy directions in this regard. The single biggest weakness of this policy direction is the inability to enforce this concentration zone.

In addition to protecting the green zone and providing guidelines for ways to manage physical growth, the LRSP provides some direction on transportation choices for the region. Specifically, the LRSP stated that the region must break its dependence on the automobile if it wishes to maintain a high quality of life (GVRD, 1996). The LRSP provided three objectives related to transportation to reverse this trend: 1) to work with municipal, provincial and federal levels of government, including neighbouring regional districts, to create a transportation system that can support the protection of the green zone, complete communities, and a compact metropolitan region; 2) manage growth and development to reduce travel distances while also putting emphasis on other forms of transportation besides the automobile; and 3) to encourage certain types of transportation, such as transit, while also discouraging others, such as automobiles (GVRD, 1996). This policy direction brings into focus the importance of providing alternative forms of transportation if cities wish to move away from the automobile. Despite this, the wording of this section makes one thing very clear: Metro Vancouver has no control over transit planning (that power rests with Translink, the region's transportation authority). It is a significant weakness in the policy, as public transit is crucial to helping the region reduce automobile use.

Despite strength in the document's policy directions, the LRSP does fail in a major way: it does not make any connection between land use planning and economic

development. The admirable goals outlined in the LRSP require the coordination of all aspects of planning, but this plan does not include any reference to economic development policies, save for mentioning that cities should try and target job growth into areas somewhat close to housing. Long term planning for a livable and sustainable region needs to address economic development in a way that coordinates these efforts with urban planning in order to support protection of the environment, reducing car use, and mitigating climate change.

5.1.2 Metro Vancouver 2040: Shaping our Future

While the LRSP did represent a significant step forwards in terms of the way the region views growth management, Metro Vancouver still saw the need to continue to work on this issue. Metro Vancouver has created a new growth management policy that is near completion, entitled “*Metro Vancouver 2040: Shaping our future*” (draft). This document includes many of the goals that were in the LRSP, but also goes more in depth on how to achieve them, while also adding some further objectives. Most notable among these is the inclusion of a goal that focuses on supporting the local economy. The policy itself has five goals: 1) Create a compact urban area, 2) Support a sustainable local economy, 3) Protect the region’s environment and respond to climate change, 4) Develop complete communities, and 5) Support sustainable transportation options (Metro Vancouver, 2009). Goals 1, 4, and 5 are similar to the LRSP objectives, with more detail. While goal 3 is also quite similar to the “protect the green zone” objective from the LRSP, the new strategy incorporates objectives aimed at reducing the region’s impact on climate change. Goal 2 represents the most significant addition to the strategy that was not present in the LRSP. As such, I will focus briefly on these two goals, and conclude

with overall thoughts on the strategy. It is worth noting, however, that while the new growth strategy does retain the growth concentration area, the spatial extent of this has been significantly expanded (see figure 2).

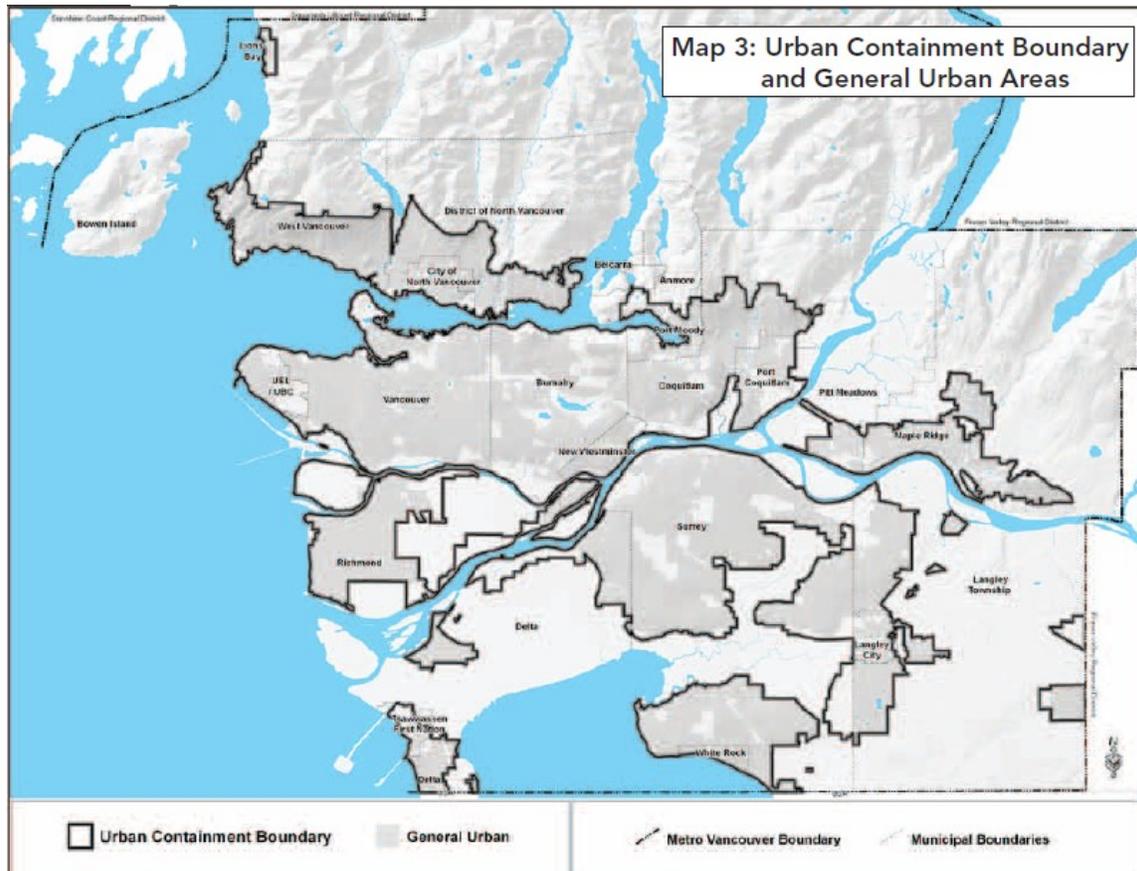


Figure 2 - The new Growth Concentration Area as of fall, 2009 (Metro Vancouver, 2009).

As was stated when examining the LRSP, the absence of firm connections between economic development and planning a more sustainable urban area represented a serious deficiency, one that the new strategy appears to be trying to fix. It makes the connection between a healthy regional economy and the achievement of urban planning objectives. While it does not make the direct connection between lowering automobile dependence, it does state that “urban centres distributed throughout the region provide more opportunities for services and jobs to be close to home and achieve greater

economic efficiencies and transportation access” (Metro Vancouver, 2009, p.23). This means that the strategy is indirectly implying there should be attempts to direct job growth in specific areas to help strengthen the other objectives, such as a compact urban area and building complete communities. Unfortunately, it does not make any specific recommendations about economic development objectives. Like the LRSP, this is likely because of the nature of Metro Vancouver, which does not have a direct mandate in relation to economic development. Other important aspects include more stringent definitions of land use designations that are related to employment areas and industrial lands. It even provides an objective that specifically targets the protection of industrial land from conversion to other uses. While it does not tackle some of the more specific issues regarding stronger connections between economic development and sustainable land use planning, it certainly represents a significant step towards recognizing the importance of economic development if the region hopes to create a more sustainable future.

The second notable aspect of the strategy compared to the LRSP is an expansion from protecting the green zone to a broader goal of protecting the region’s environment, with the most notable aspect of this goal being the connection to climate change. The overall goal still maintains much of what was outlined in the LRSP regarding protecting the green zone, including protecting habitat, wetlands, forest, agricultural, and general green space. However, strategy 3.3 makes specific reference to climate change:

“Encourage land use and transportation patterns that reduce greenhouse gas emissions” (Metro Vancouver, 2009, p.38). Once the new strategy is approved, cities in the region will be required to incorporate plans to achieve this goal into their regional context

statements. This means that once they are completed, cities will now have some reference to the connection between land use and climate change. This represents a significant step for the region, and it was something the LRSP was lacking.

As the whole, the document does have the over arching goal to protect the local environment and respond to climate change (see section C “Challenges and responses”, p. 8). A specific reference to climate change within one of the strategies is a step towards increasing the resilience of the region. Unfortunately, the strategy makes only one reference to depleting stocks of oil, seemingly neglecting the significant problem that that issue will play in virtually every goal and strategy in the plan.

5.1.3 Importance of the LRSP and Regional Growth Strategies

While the LRSP and the new RGS may have no direct impact on Yaletown or Crestwood Corporate Centre, they do provide some important context. Mainly, the LRSP solidified in regional policy the ideas that unchecked growth could not continue; that growth needed to be focused into a more compact region; that current development patterns adversely affected the environment; and that automobile use needed to decrease. It also provided evidence of a regional understanding that all of these issues had an impact on the livability of the region, further promoting the idea that livability was key to the region’s success. The idea of creating complete communities is also important, and I argue that these are integral to resilient cities. They can provide citizens with the opportunity to fulfil their daily needs within their own communities, and when necessary, the strong connections created by rapid transit can allow easy access to nearby communities. Complete communities also more closely follow smart growth principles,

helping mitigate the need for the personal automobile, increase resource efficiencies, while still promoting the economic advantages described earlier.

After examining Metro Vancouver's policies on growth management, we can see that there is a trend moving towards creating stronger links between our development patterns and their impact on the environment. After the LRSP was adopted, each member municipality in the region was to draft and adopt a regional context statement (RCS) outlining how their city would achieve the goals listed in the LRSP, and a similar process will be used once the new strategy is completed. There is thus the possibility that all municipalities in the region will move towards more resilient development patterns, while making specific reference to land use and climate change. However, given the unbinding nature of the growth strategy, and the lack of planning authority Metro Vancouver has, it is difficult to be confident of a regional transition to more resilient land use patterns and development.

Regardless, both Crestwood and Yaletown are situated in a region that recognizes the importance of having a more sustainable land use and development pattern. However, despite the regional government providing regional growth strategies, in BC regional governments do not have the authority to produce any enforceable targets or policies for their member municipalities. Thus, the question of whether or not Richmond and Vancouver place the same level of commitment on resilient development patterns needs to be answered by examining the most significant city planning documents and triangulated that data with the results from my interviews with planners and economic development officials.

5.2 City of Vancouver

The city of Vancouver has a population of roughly 600,000 people, but more importantly, it has some of the highest population densities in the region, with roughly 5000 people per sq km. In terms of its land use and built form, Ian explained that Vancouver aims “for compact, complete communities” and puts “an emphasis on amenities and public benefits”. A look at its housing stock demonstrates this attempt, given that it is dominated by higher density units, with only 19% of units being single detached homes¹¹. Instead, apartments and duplexes make up 17% of units, apartment buildings fewer than 5 storeys make up 35%, and apartments over 5 storeys make up 24%. This is likely attributed to the fact that like Metro Vancouver, Vancouver has a history of managing its urban growth in an attempt to make a more “sustainable city”, and it has done so primarily by focusing on land use patterns and the built environment. In addition, it has a history of understanding the connections between land use and the city’s impact on the climate and environment. In 1990 *Clouds of Change* (a report created by the City of Vancouver Task Force on Atmospheric Change, written in 1990) was released, demonstrating an important understanding of the impact city activities could have on climate change. The report presented the idea that the city had a responsibility to commit itself to achieving three primary targets, one of which was a significant reduction in emissions such as methane, sulphur dioxide and carbon dioxide, as well as a complete phase out of products containing ozone depleting chemicals (Task Force on Atmospheric Change, 1990). It provided a suite of policy recommendations to achieve these three targets. Of significant importance in the context of the impacts on the

¹¹ All city of Vancouver figures were collected via the community profiles available on the Statistics Canada (2006) website. All figures For Yaletown were calculated using the Canadian Census Analyzer and the corresponding Dissemination areas (DAs).

central area (where Yaletown is located) were the recommendations that were designed to lower CO₂ emissions. These included (but are not limited to): Reduce the number of automobile trips in the city and the region; increase opportunities for non-automobile transportation including cycling, walking, rail, buses, and alternative vehicles; and reduce the need for transportation in the city and the region (Task Force on Atmospheric Change, 1990).

In the context of land use planning, the report made several recommendations specific to land use. It recognized that while transportation plays a significant role in emissions management and city development, the demand for transportation arose directly from the way in which land was used and planned in the city. Land use patterns, and the development that comes along with it, dictate travel volume, the modes of transportation, and where the travel was occurring. Most crucially, the report recognized that if the city wanted to shift residents to more efficient modes of transportation (transit, walking, cycling, etc.), it would have to create the necessary land use patterns. The overarching objective is what the report refers to as “reurbanization”, that is, “increasing the intensity of activity within present urban boundaries and “hardening” the urban fringe (reducing sprawl)” (Task Force on Atmospheric Change, 1990, p. 45). Furthermore, it argues that this process will make for a more effective use of the city’s existing infrastructure and services, reducing infrastructure costs, and would relieve pressure on agricultural land (Task Force on Atmospheric Change, 1990). Perhaps one of the most notable aspects of the report’s reference to the importance of land use was its recognition that striking a balance between jobs and housing was not enough unless people who work within a given area have the option of also living in the same area (Task Force on

Atmospheric Change, 1990). As such, it would be important for the city to create policies that encourage access by proximity, which the report recommends to council to make the central focus for the planning department, rather than access to transportation. More specific recommendations to achieve this include energy-efficient land use policies, which include encouraging greater density through multiple unit residential developments, integrating land uses for work, residence, and shopping into mixed-use developments, encouraging residential clustering, zoning for high density developments along established routes, and encouraging infill development, to name a few (Task Force on Atmospheric Change, 1990).

Thus, while recommendations in *Clouds of Change* did not make specific reference to Yaletown, it did represent an early example of the city's recognition that its policies, in particular, its land use policies, could have a positive impact on atmospheric change (which we now know as climate change) and other environmental considerations. Furthermore, while not directly mentioning economic development, its recommendations related to proximity show at least an initial understanding that it is not enough to simply have a jobs-housing balance in the city (or even the region, for that matter). Instead, access to employment opportunities close to other services and places of residence is a significant component of achieving transportation related objectives, as well as emission reduction targets.

Soon after *Clouds of Change* was released, the city enacted its perhaps most notable planning document, the *Central Area Plan*. The plan was central to what Ian explained was Vancouver’s “living first strategy”, which put a re-emphasis on Vancouver’s metropolitan core (see figure 3). It outlined several

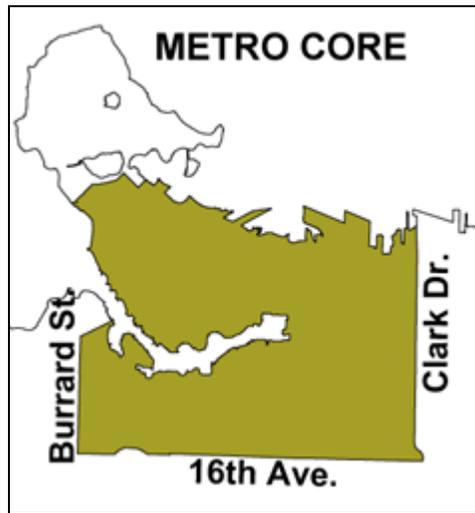


Figure 3 – Vancouver’s metropolitan core (City of Vancouver, 2010)

common issues the city found in the central area, including livability and high densities, lively retail, and additional office zoning. More interestingly, the plan outlined seven goals that were “used as touchstones in further development of Central Area Plan policies” (City of Vancouver, 1991, p.3). These goals included: “the economic generator”, an “alive downtown”, “for all people”, “a spirit of place”, “a central area in nature”, “a walk-able central area”, and “an accessible central area” (City of Vancouver, 1991, p. 3). These goals demonstrate a marked change in the view of Vancouver’s downtown. Through this plan, the City of Vancouver was now placing an unusual residential focus on the downtown core. Given that the plan is so prominent in Vancouver’s planning history, and given it is essential to examine the context of Yaletown, the plan deserves a closer examination.

5.2.1 The Central Area Plan

As one would expect, the purpose of this plan is to provide land use directions for the central area. There are several themes within the *Central Area Plan* that are notable. First, the plan targets an adjustment to the way office space is zoned and developed within the metro core. Specifically, it states that the city will attempt to refocus existing and new office development into the traditional central business district (CBD), rather than across the entire downtown peninsula. This was to achieve two main objectives: 1) promote office development in a way that ensures it is located close to areas with sufficient transportation capacity (with an emphasis on access to public transit) to promote efficient movement, and 2) allow for increased available land for residential development. Increasing residential development is the second significant theme. According to the plan, housing “bring[s] vitality and life to downtown” while also “providing customers for shops and services” (City of Vancouver, 1991, p.19). This represented a significant shift in the way the core of a city was approached. The city recognized the importance of housing as a way to deal with the issues of congestion and transportation, as it states that “providing more opportunities to live close to the region’s largest employment concentration means fewer demands for major transportation facilities to take people to work from homes in the suburbs” (City of Vancouver, 1991, p. 18). Furthermore, the plan acknowledged the importance of a variety of housing types as they bring in a diversity of human activity to the core. Its housing policy focused on creating new neighborhoods that encouraged housing diversity, including promoting housing for families with children, as well as increasing the stock of low-cost housing (City of Vancouver, 1991). The city viewed increased housing in the central area as the method to fulfil the regional goal as per the region’s plan of balancing population and

jobs throughout the region. While written prior to the LRSP, this objective matched well with the regional government's next growth management strategy. In addition, having a strong jobs- housing balance, with an emphasis on proximity, corresponds well with smart growth style land use, and certainly represents a more resilient land use pattern.

Increasing residential densities and concentrating office development to allow for this increase represents a significant change in the way a city approaches a downtown core in North America, but a third theme from the plan is also significant in the context of my research. In addition to the above goals for the central area and as stated earlier, a key theme for the city was "an alive downtown". While increasing the amount of residential space aided in this objective, the city also put a strong emphasis on walkability, achieved by the residential increases, increasing commercial and retail activity, and more importantly, doing so by putting an emphasis on walkability. It stated that retail plays a major role in helping make the downtown core a more walkable community, but it also acknowledges that the success of the retail sector is not dependent on attracting customers from a distance, but rather, that the customer base comes largely from the residents who live downtown. In terms of design impacts, the policy strove to ensure that retail contributed to street activity, as the street was seen as significant public space (City of Vancouver, 1991). In addition, the plan also stated that the City of Vancouver would use its ability to apply development levies, which was a tool granted by the Provincial government in 1990 (City of Vancouver, 1991). These levies could be used to provide developers with the incentive of higher densities to encourage inclusionary zoning, that is, developers could be given density bonuses on the condition that they provide a local amenity such as replacement low cost housing, parks, and day-

care centres. This would become a significant tool for Vancouver planners, one that would allow them to promote a more livable downtown with a high number of amenities without significant municipal spending.

Overall, the *Central Area Plan* demonstrated that the city believed that through highly regulated and carefully designed planning practices, the city could control and create the environments they desired. Increasing residential densities, promoting walkability and the use of public transit, looking to maintain a strong jobs-housing balance, all of these factors match well with smart growth principles. What is clearly lacking from this plan, however, is specific mention of economic development objectives. The plan states that it wishes to maintain a balance between jobs and housing, but it actually focuses more on the concentration and elimination of office space from certain areas. While this objective was created to ensure stronger residential development, I would argue it represented a shortsighted approach to economic development. It is interesting that the same approach, one of highly regulated planning practices, was used to create this “living first” strategy, but not used in the same way to approach economic development. Part of this can be attributed to the already strong balance of jobs to housing in the central area, and Vancouver’s dominance within the region’s employment base. While Vancouver still holds the lion’s share of the region’s job growth, this lack of emphasis does demonstrate the obvious disconnect between urban planning objectives and economic development objectives, at least in 1991.

5.2.2 Current Attitudes Towards Planning and Economic Development

The *Central Area Plan* and the city’s living first strategy are been exceptionally successful. In terms of economic development, Ian explained that the plan was almost

too successful in that it pushed out office space. At present, the city is now undergoing a planning study and land use plan (*The Metro Core Jobs and Land-Use Plan*) to examine what the impacts of the city's living first strategy has had on the economy of the central area, specifically, how it has affected employment capacity. Interim results from this study show that the central area will have a short fall in terms of job space capacity. What it is now doing is "clearly defining the areas for job growth to reduce residential speculation in these areas". Ian explained that as expected "it was controversial because everyone saw the success of living first and how well it was working". The city has now up-zoned areas where they would like a sufficient amount of zoned capacity for office space, and Ian now believes that there will be "enough capacity for the next, at least, 30 years". In addition to ensuring sufficient job space, the city is also actively trying to find jobs to locate in those spaces. Josh explained that in the past, economic development was done de facto by the planning department. In his opinion, "planners think about the size of the boxes, the shape of the boxes, and the rules around the boxes, but what goes into those boxes is a pretty dynamic process", and believes this is where the Vancouver Economic Development Commission (VEDC) comes in. In terms of what is attractive about Vancouver, Josh explained that big one is talent. Talent is crucial for some of the industry sectors they are targeting, such as high-tech firms and green-tech firms. "For green technology, engineering talent is really critical to tackle different challenges" and "you've got to have space for those companies to expand, to do their research, etc". That said, he explained that the biggest disadvantage is space, "literal, large floor plate buildings", "you can't build a huge factory. Even for offices, landing a large office...is difficult in the downtown core". However, Josh believes that Vancouver competes for

high-tech type firms because the firms and their employees “don’t want to be in Surrey, there is no connectivity. They want to be in a relatively urban type environment, and most people do not want to drive to some distant office park to do that, in those industries”. Both Ian and Josh see a direct link between city planning objectives and economic development objectives. In terms of planning, Ian explained that “what we saw downtown is the vast sustainability jump occurred in getting the right balance between living and working in close proximity”, and that without the appropriate zoned capacity for job space, the city’s living first strategy could be in jeopardy. Furthermore, Josh explained that if the city wants to attract or develop the high-tech or green-tech industry, there needs to be enough room for them to grow and expand. Josh agreed that “Vancouver is a bit of an intangibles city”¹², and that this gives it a great economic advantage, particularly for high talent based on creative industries. Interestingly, both Josh and Ian explained that the affordability issue in Vancouver is a serious challenge when trying to meet sustainability goals as well as economic development goals because housing prices have become so high that mid-career professionals cannot afford to live in Vancouver.

On the broader level, Ian explained that he and the city as a whole recognized that the future is full of uncertainty, and they need to be prepared for it; “resilience is about ensuring that you’re ready for uncertainty, and there is a ton of uncertainty in the future”. Perhaps most importantly in helping Vancouver reach a more resilient land use pattern, the city appears to recognize the important links between having a balanced jobs and housing ratio in close proximity to public transit. Ian explained that “the bones are

¹² Intangibles refer to qualities other than those that can be quantified or priced, such as access to amenities (see sections 6.1 and 7.2 for further elaboration)

there”, and that “the next great sustainability leap in the city of Vancouver is ensuring that same balance we’ve achieved in the downtown is achieved elsewhere, because once you get that land use right I think you’ve gone along way in terms of carbon foot print”. Vancouver is unique in the region, given that “the city developed its bones at a time when there wasn’t an abundance of energy”, and that much of the city was laid out with short block lengths due to the streetcar system that existed prior to the age of the automobile. In terms of responding to the coming energy crisis, Ian believes that because of this legacy, the city will be prepared to “move to [planning for] a peak oil future, where there is going to be limits on energy again”. The question is, how do these attitudes to planning and economic development appear on the ground in my case study of Yaletown.

5.2.3 Yaletown

There is little doubt that the *Central Area Plan* has played a significant role in ensuring that Yaletown developed into a dense, walkable neighbourhood. The area of Yaletown has a population of roughly 11,500 people, and roughly 8,200 jobs. In the region, roughly 67% of trips to work are made by single occupancy vehicles, whereas in Yaletown only 51% are made by car, which is also the Vancouver average. Instead, 31% of trips to work are made by foot (with another 2-3% coming from “other” modes such as cycling), whereas the regional average is roughly 8%, and the Vancouver average is 12%. Interestingly, Yaletown has a below average transit ridership, with 10% of trips to work made on transit, compared to roughly 16% at the regional level and 25% in Vancouver. Clearly, walking has become a dominant mode of transportation, perhaps speaking to the success of the *Central Area Plan*.

The city's *Metro Core Jobs and Land-use Plan* provides us with some finer detail in terms of Yaletown's local economy. In terms of importance to this paper, the city has found that roughly 26% of jobs in Yaletown fall within *professional, scientific & technical services*, especially computers, which is the largest industrial sector in Yaletown (City of Vancouver, 2006). This reaffirms my hypothesis that Yaletown is a significant location in terms of the presence of high-tech firms. The study also found that roughly 59% of employees working in Yaletown live within the city of Vancouver, with 26% living in the metro core of Vancouver, meaning it is predominantly a source of local employment (City of Vancouver, 2006). This is also a higher than average figure for the metro core as a whole, where 53% of employees reside in the same city as they work.

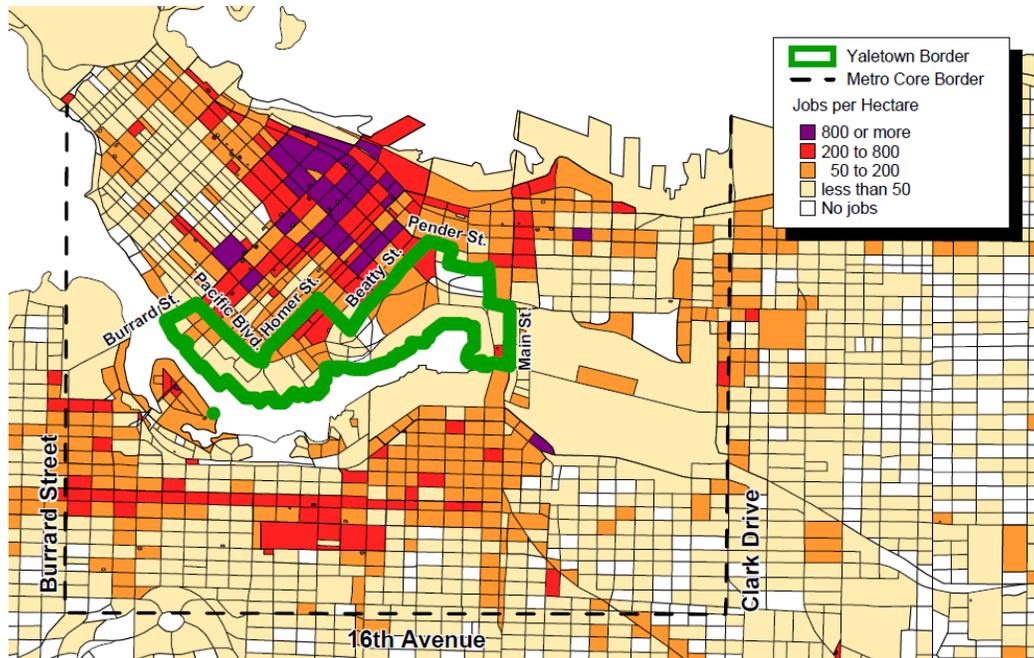


Figure 4 – Yaletown according to the City of Vancouver. Notice the higher density of jobs located in the middle of the area (highlighted in red). This is also the area’s designated historic district (City of Vancouver, 2006).

In terms of built form, Yaletown is dominated by high-density units. In this neighbourhood, 94% of units are apartments over 5 storeys, which is predominantly made up of Vancouver’s famous tower and podium designed buildings (see figure 5).



Figure 5 – Tower and podium consisting of town home residential units (Photo Credit: Duncan Wlodarczak)

Yaletown also has a significant heritage component, as historic Yaletown has experienced a transformation from old warehouses to trendy office locations and commercial spaces. This area is of particular significance in the context of high-tech firms, as such spaces are seen as attractive locations (see figure 6).



Figure 6 – United Front Games (video game developer) sits on top of Yaletown Brew Pub. Both locations are located within a heritage build in the heart of Yaletown’s historic district. (Photo Credit: Duncan Wlodarczak)

Josh explained that high-tech firms ended up in Yaletown starting in the mid to late 90’s because the space was cheaper, it was “more open”, firms could do what they wanted with it, had/has proximity to amenities, and was/is near downtown without being at downtown prices. Also important for Yaletown is that it offered a “funky, fun place” to live and work. Much of this is attributed to how Yaletown developed. Originally, Yaletown and its surrounding area consisted of old warehouses and the Canadian Pacific (CP) rail yards. After Expo 86, the area was completely redeveloped. The warehouse district became historic Yaletown, with the warehouses being transformed into office, retail, and residential space in old brick and timber buildings (see figure 7),



Figure 7 – Converted Warehouses in Yaletown’s Historic district (Photo Credit: Duncan Włodarczak) and greater Yaletown becoming a high density mixed use neighbourhood of point towers and podiums consisting of walk-up town homes (Punter 2003, Berelowtiz, 2005, Harcourt, Carmeron & Rossiter, 2007).

In summary, Yaletown is a dense urban environment with a high percentage of trips made by alternative modes of transportation, a vibrant street scrape and with the high-tech industry representing a significant source of total employment opportunities in the neighbourhood.

5.3 City of Richmond

Richmond is a suburb of Vancouver, with a population of roughly 182,000, but more importantly, a density 355 people per sq km, or just over 1/5 of Vancouver’s

population density. However, it is worth noting that roughly half the Richmond's 128 sq km is agricultural land within the Province's *Agricultural Land Reserve*. This means that if we take the roughly 128 sq km and divide it in half, Richmond's actual population density is closer to about 2800 people per sq km, or just over half that in Vancouver. That said, Richmond's built form is dominated by low density suburban type sprawl with roughly 41% of the units being single detached homes, with 19% of units being row homes (or town homes), 25% apartments under 5 storeys, and only 6% apartments over 5 storeys (with the remainder consisting of a mix of 'other' types, such as duplexes). To understand this, we can examine the city's *Official Community Plan*, which was created in 1997, and explicitly stated Richmond that wanted to maintain its single-family home character, with higher density units being focused into ground oriented housing, such as row homes. While Vancouver's *Central Area Plan* allows us to look at a more context specific policy document that directly impacted one of my case studies, to understand Crestwood we need to look at the municipal OCP.

5.3.1 Official Community Plan

According to the OCP, Richmond has and will continue to make a strong commitment to keeping its extensive agricultural land, will direct the bulk of its growth into the city centre, but will also commit to maintaining its single family character¹³(City of Richmond, 1997). In addition, it states that the city will strive to maintain a balance between urban and rural areas, development and the natural environment, and a jobs and housing balance, but highlights that it will complement its single family character only

¹³ Recalling sections 5.1.1 and 5.1.2, Richmond was originally not placed within the growth concentration area in 1996, but in the 2009 draft RGS, roughly half of Richmond is now within the expanded area. The bulk of that expanded area in Richmond is single family dwellings.

with compatible housing opportunities (City of Richmond, 1997). This is an important objective, as it provides an example of the desire to avoid creating neighbourhoods with very high densities, such as hundreds of high-rises like in downtown Vancouver, but would prefer to maintain single-family homes or other ground oriented homes, such as town homes and walk ups. When interviewing city planners for the city of Richmond, I found a reluctance to increase densities among the large tracts of single-family homes. Where increased density was targeted, it focused more on these ground oriented but more dense units, such as town homes, with the city preferring to focus any large increases in densities into the city centre, which already contains a large number of high-rises. When describing its overall growth management strategy, the OCP highlights that it will retain the single-family character of neighbourhoods while also aiming to protect agricultural lands and concentrating growth into its city centre.

Despite clearly defining much of the city as single-family homes in nature, the city does not view itself as a bedroom community but as a city. The city does endorse concentrated growth to create a strong city centre, or a true downtown with a business core, and urban neighbourhoods (City of Richmond, 1997). The OCP explains that there is a need to offer residents choices to live, work and play, while also providing schooling, shopping, and other services within walking and cycling distances (City of Richmond, 1997). It states that the city will promote a sense of community by focusing on improving the walkability of neighbourhoods, including creating direct, safe and pleasant routes while also balancing regional uses located in neighbourhoods with local resident priorities, including meeting the needs of local residents by incorporating services which recognize the daily nature of their use (City of Richmond, 1997).

According to the OCP, “as Richmond’s economy matures, it will be important to maintain a balance between jobs and housing and thereby minimize the environmental and personal costs of commuting” (City of Richmond, 1997, section 3, p. 19). It highlights that many of the new jobs in the city will not be high paying and as a result, the city should strive to offer entry-level homeownership options and rental choices (City of Richmond, 1997). The provision of this housing is strikingly different when comparing Richmond’s city centre and neighbourhoods outside of it. The city will focus on providing variety in housing form, but will focus on single-family character housing (cited as the type of home voted most popular by its citizens in a survey conducted by the city), or multiple family housing located near major community facilities and services. Such housing will only be built along arterial roads, with low-rise multiple-family housing also only being built near major community facilities (City of Richmond, 1997). Higher densities seem only to be permitted inside the city centre, and only if they are on major arterial roads, with large lot sizes, good access to public transit and within walking distance of commercial services (City of Richmond, 1997).

In terms of transportation, the OCP focuses on the road network, transit, pedestrians, cycling, and automobiles. In 1997, there was increasing concern over traffic congestion, noise and air pollution and the amount of paved area (City of Richmond, 1997). Thus, the city committed to reduce automobile dependence by reducing travel demand and shifting away from cars to walking, cycling, and transit (City of Richmond, 1997). To do this, it will focus on improving the road network in ways such as creating shorter block lengths, incorporating cycling provisions on all new major roads, and creating more transit friendly streets and bus routes by increasing bus lanes, bus stops, etc

(City of Richmond, 1997). The city will also seek to reduce travel distances for citizens to regular commercial activities, jobs, recreational opportunities, and schools to encourage walking and cycling (City of Richmond, 1997). Despite this, the OCP also states the car will continue to be the dominant mode of transportation, and devotes attention to how to accommodate it (City of Richmond, 1997). Most notably, it talks about encouraging traffic onto major arterial roads while attempting to reduce traffic in residential neighbourhoods, as well as ensuring that the city's major roads can accommodate commercial and industrial vehicles for safe, but also efficient, city wide distribution of goods and services.

5.3.2 Current Attitudes Towards Planning and Economic Development

Perspectives offered by the city's planners make it clear that Richmond will continue to maintain the single-family character of the city. In terms of future growth, Danielle explained that the city would try to encourage as much intensification as possible in the city centre, in and around the new rapid transit line, the Canada line. Steve stated he believed that "in the city centre it makes perfect sense to coordinate and to have mixed use development, to have housing, your employment and your transportation" but "when you're dealing with an established industrial area like Crestwood it is a little more complicated". Both Steve and Danielle explained that the city centre would experience the bulk of growth, including office development. Steve explained that the city would rather see office space intensified in the city centre, rather than more dispersed office growth around the rest of the city. According to Danielle, this is because it is simply "too residential" in the rest of Richmond, and they need that space to have adequate room for housing. She explained that they do not have the capacity to

house the population growth they are expected to experience, and that while the city centre can absorb much of this, they will need to “diversify the single family mix” if they want to find ways to accommodate that growth. Reflecting the OCP, Danielle said they will look to develop different types of ground-oriented housing, such as town homes, laneway homes, etc, and only the city centre will be zoned for high-rises. She also explained that while the city does not use the term smart growth in any of its plans, they do want to provide residents with the ability to “live, shop and play” in the same community; in essence, they do want complete communities, just with most of the employment base and future growth in the city centre.

In terms of economic development, Laura stated that “if there is one thing that puts it in a nut shell it’s business retention, expansion, attraction”. According to her, the city focuses on about five key sectors, one of which is the high-tech sector. In terms of economic advantages, she explained that Richmond is “very centrally located within the lower mainland”; that “it’s new, but it’s true, it’s close to Vancouver”, and Richmond has “lower rates for the same type of office space”, while also mentioning the talent base of Richmond is quite strong. She also explained “in the past we really competed on price, quite successfully. I think times are changing, and one of the reasons is we are very easily accessible from Vancouver and the airport. If you talk to any company, they want to be on the transit corridor (Canada line); they are willing to pay a premium”. Laura recognized that the times were changing in Richmond; that increased costs of living, and increased real estate prices will decrease their competitiveness with other suburban municipalities in relation to price, but they are becoming more competitive on the “soft things”, such as accessibility. Furthermore, she argued that “if the central area does not

provide the opportunity, we are very concerned about our ability to attract high-tech firms”. It was very apparent that the new Canada line was seen as fundamental to Richmond’s economic future.

More broadly, Laura argued “very little linkages have been made between jobs, housing, and transportations”, and that in the past “any economic development person that you talked to at the local level, it came out of the planning department”, and that someone in planning was doing it “off the side of their desk”. Steve did explain that in the past, a place like Crestwood was “sort of allowed to develop on its own”, but both Danielle and Laura agreed that there are very important and necessary linkages between where employment opportunities are in relation to housing and public transportation. In terms of Richmond’s overall approach to more resilient development, Danielle stated they were “moving towards it” but that “we don’t have the answer yet, we haven’t defined it fully, so that’s going to be early days”. Steve said that “it wasn’t always an easy sell” and that it will be “a gradual, incremental process” towards it. Danielle felt that “the way the foot print of Richmond is...in 20 years, yes you’ll see more city centre growth, but changing outside the city centre will be very challenging...you’ll still see a lot of cars in the city”. She explained that she did not know “if energy [prices] will rise in my working life, the next 20 to 30 years” and that she does not know if it will “hit the residents as much as it should to elicit some change in behaviour”.

5.3.3 Crestwood Corporate Centre – East Cambie

While Yaletown is a defined neighbourhood, Crestwood is an office/business park located in a larger community, known as East Cambie. Thus, to compare the two, I examined East Cambie as a whole, which allows me to paint a picture of the local context

within which Crestwood exists. East Cambie has a variety of land uses, but each is almost completely segregated from the others (see figure 8).

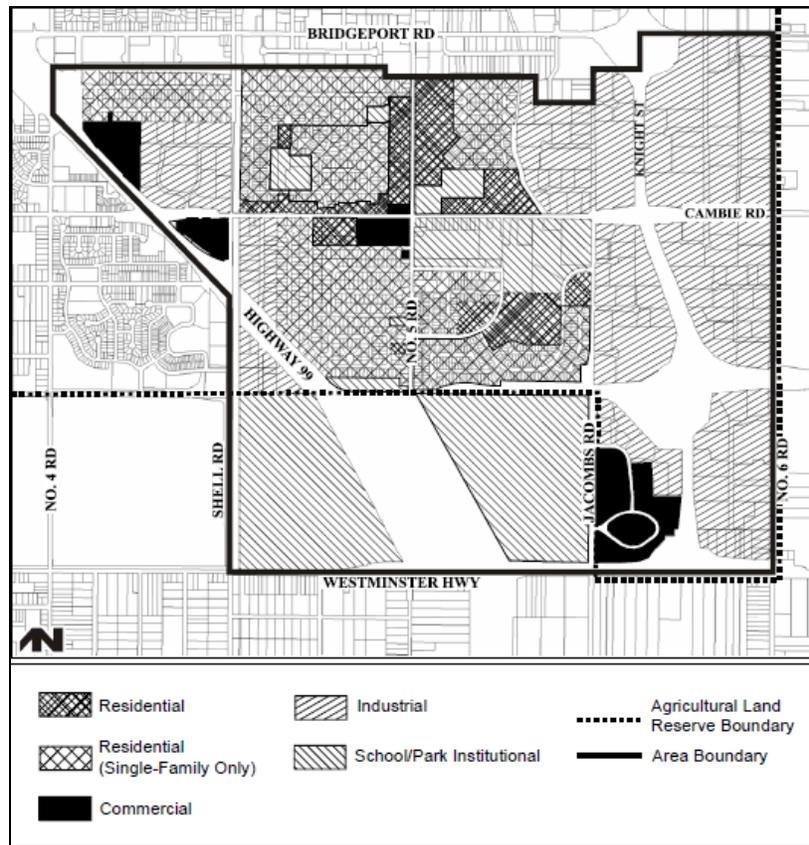


Figure 8 – East Cambie (City of Richmond, 2002).

Crestwood is located along #6 road and Westminister highway, with all the residential units located on the opposite side of Knight Street Bridge and along Cambie Road. The area itself has a population of roughly 11,000, who predominantly live in single-detached homes. In East Cambie, 62% of units are single detached, which is substantially higher than even the city average (41%) and the regional average (35%). The rest of the units consist of row homes and apartments/duplexes, with only a small portion of apartments under 5 storeys, and zero apartments over 5 storeys. In terms of transportation, roughly

75% of trips to work are made by cars, which is just over the Richmond average (73%)¹⁴. Trips made by transit represent only 7% of trips, under the Richmond average (12%), and other modes, such as walking and cycling, make up only 5%, which is roughly the Richmond average. Unfortunately, while Richmond is currently undergoing an employment lands study, but no data is available yet to compare with the data available for Yaletown.

Laura explained that she saw Crestwood as “the jewel in the crown in Richmond, of last century”. She argued that it is “becoming a less desirable location compared to some of the competitors simply because it’s not on the Canada line” and that it “is going to have a harder and harder time attracting tenants”. That said, she explained that it is still an attractive place as a campus style location (see figure 9),

¹⁴ It is important to note that these figures come from the 2006 census, which was completed long before the Canada line was completed. Early reports of figures for Canada line ridership have shown an increase in ridership, but these numbers cannot be applied in a way to determine what percentage of trips in Richmond are now made by transit.



Figure 9 – Crestwood’s campus style location is an attractive setting for many high-tech firms (Photo credit: Duncan Włodarczak)

but that it will only be able to attract a certain type of employer; “the company that will want to locate in downtown Vancouver, Crestwood cannot compete with anymore. The reason they want to locate downtown is because of the accessibility, the connectivity, because their employees can live nearby, etc”. She argued that it is “premium price, in regional terms, it’s a good deal compared to downtown Vancouver”, and that it will be particularly attractive to a firm that needs “flex space”, that is, space that allows for light industrial uses for the production of physical goods; “a lot of technology companies are product based, where they develop a product. One of the advantages that Richmond has...is that we still have the flex, office/warehouse/industrial space”.

6: LOCATION REQUIREMENTS FOR FIRMS

6.1 Yaletown

With the combined data from interviews, the literature review, and various documents and research reports, there do appear to be some distinct requirements for high-tech firms wishing to locate in a dense urban space such as Yaletown.

The over arching factors that play a role in where firms like those found in Yaletown seem to prefer are more related to what can be called the intangible qualities of a given location. According to the extensive research done on high-tech firms, such as that mentioned in my literature review, employees represent the single most important component of a high-tech firms. As such, attracting the best employees, or talent, represents the most important thing a high-tech firm can do, and where they locate appears to play a strong role in firms' ability to attract this talent. My research found that locations that provide the best "vibe", described using words such as cool, funky, or even gritty, is one feature that can help distinguish a location from another. While none of the interviewees could necessarily describe "vibe" more concretely, features that were continually brought up were things such as lively, active streetscapes, a high level of culture that was preferably diverse, a very high number of amenities, particularly coffee shops and lunch spots, and an interesting built form, with a fair amount of emphasis on architecture that resembled brick and timber framed buildings. In describing his firm's location, Mike explained that there are "so many cool restaurants and pubs and it was just a fun place to be. When you are off work and you are done programming and blogging,

whatever it is, you just don't want to walk out into a parking lot in the middle of nowhere" and that "we like having a cool old rickety brick building with wooden beams, we like being in a neighbourhood that was growing more organically". Jessica confirmed this, saying, "people want that kind of option. Having 20 places for lunch under 10 bucks is a big deal for people". Furthermore, Carolyn argued that "brick and timber buildings offer a different vibe than a corporate office", but did argue that it really was impossible to quantify how important that was. Certainly, these intangible qualities of a location were a dominant theme throughout all of the interviews, with Carolyn arguing that locations like Yaletown have everything: "amenities, transit, atmosphere, are all reasons why someone wouldn't want to locate in a business park."

Locations that provided the shortest commute time were seen as best. This could mean a location with residential units located in very close proximity, but what was essential was a high level of access to public transportation, with other alternative modes of transportation. Jessica stated that "we did a survey of our staff on how we could change or improve the company. Much to our surprise, over and above increased salaries or increased travelling opportunities, was move downtown". Prior to this, her firm was having trouble because "people were bailing on interviews. People would not show up, we couldn't understand why. We'd follow up with them up and they'd say it's too far to get there". The centrality of Yaletown was one of the most often cited qualities of the location, with its great connections to multiple transit connections, particularly the Skytrain and the Canada line. When explaining the commuting patterns of her firm, Jessica explained that "1/3 live downtown in walking distance, less than 1/3 drive, other half commute by skytrain or bus". She argued that "if people can get here easily, they

look at that”, stating that it is easier to attract talent and clients because of their location. She also believed that “by giving up a daily commute, that significantly increases the quality of life”. According to Mike, long commutes are simply “a waste of time”, particularly when so much of the work can be done at home. For those who do commute, Jessica argued that “people are willing to commute for a good job, particularly if it’s in a central location”. Carolyn confirmed that Yaletown’s central location is very attractive, particularly because it is also located adjacent to Vancouver’s downtown core, providing access to the downtown core client and services base, without paying downtown core prices for space. Price did play a role in some firms’ decisions, and Mike did highlight that his firm moved out of Yaletown, while Jessica expressed concern that her firm may be forced to move soon as well. That said, while Mike’s firm recently moved, he acknowledged that they would not have moved had the owner of the firm not found a much better location for a cheaper price, located near Gastown, which offered all the same qualities as Yaletown.

In addition to the qualities of the place, the fact that other similar firms are located in Yaletown was seen as a positive attribute. For many firms, but particularly smaller firms, such as new start-ups, being located in close proximity to other firms allows for a constant exchange of information and knowledge that aids in problem solving. For start-up firms this was particularly important, as there is a constant need to learn, and being able to cross paths with employees from other firms can allow for a quick exchange to aid in problem solving, in an industry where time is at a premium. Mike stated that for “younger companies there is more back and forth talking, sharing ideas, shooting the breeze”, and this is where much of that knowledge exchange occurs.

Jessica highlighted that parking was an issue for their firm, and they did want access to parking, but acknowledged that it was decreasing in importance, and alternative modes, especially public transit, were a much more crucial component. Carolyn highlighted that some firms that do contact her are concerned about the parking issues, but that it was decreasing in importance. This varied between firm type and size, with start-up firms, with a more youthful employee base, placing less emphasis compared to older, more established firms with an older employee base. That said, Yaletown did appear to offer a sufficient amount of parking according to those interviewed, and while the price was high, they all acknowledged that this was a trade off to obtain the other qualities listed above. Carolyn explained “if you’re prepared to walk a little bit there is parking. Parking has never been as big an issue as what people say that it is”, while Jessica argued that they would probably not relocate to a location with plentiful parking because it would mean leaving Yaletown or the downtown area in general. She stated that “we’d have to save a significant amount of money, and then you’d have to put that back into the staff in a different [form]”. This also reaffirmed the point that the high price of Yaletown really was not a sufficient issue to cause relocation for many firms. Jessica explained that “we don’t have access to every amenity, we don’t have a gym, those kinds of things”, and that “the downtown core is a few blocks away, it’s more likely to have that”. As stated before, she argued that even if they were to save some money, it would have to take the form of a source of funds to be provided back to staff in another form. She pointed out that “at the end of the day, we are going to pay what we need to, to attract qualified staff. And as opposed to paying everybody individually more, if we can provide something common that’s attractive to everybody, it’s a win win. In our case,

it's this space". Mike confirmed this, arguing "when it comes down to it costs are important, but I think knowing [the owner], rather than sacrificing good office space where you can invite clients down, and be close to the neighbourhood, be close to other businesses we are working with, rather than cutting the umbilical cord, and going out in the middle of nowhere to save some bucks" they would "rather work on business development to be able to afford to be where [we] want to be as opposed to sacrifice the connectivity of that neighbourhood to save on the bottom line"

Thus, it appears that for firms wishing to locate in Yaletown, the intangible benefits are the dominant feature. Several of the interviewees highlighted that Gastown was the new up and coming location for high-tech firms, particularly for start-ups, because it offered all of these qualities but at a cheaper price than Yaletown. This is exemplified by a story Carolyn shared, in which "a client leased some space in Gastown before they even looked in the suite, because one of the tenants is a modelling agency, and there's about 6 girls that walked out doing a pretend runway in the main floor, these guys went, high-tech guys, went 'oh my god, look at these cute girls, we'll take it!', and they didn't even see the space!". Thus, if a resilient cluster is going to provide attractive qualities for these types of firm, it must provide a high number of amenities and a high-level of other intangible qualities if it is ever going to compete.

6.2 Crestwood Corporate Centre

High-tech firms that locate in places such as Crestwood are no different than those in places such as Yaletown in that they place the same importance on talent; attracting and keeping the best employees appears to be of the utmost importance. For example, Eric explained "you don't want to lose key people. Our business is based on

the knowledge in those people's brains". Grant confirmed this, saying "it's very important that I keep these people", and giving the example where "last Christmas I bought them all Play Stations". Despite this, the more notable factors for firms locating in Crestwood differed greatly from those in Yaletown. The interviewees all highlighted the attractiveness of amenities, particularly good "lunch spots". Grant did acknowledge that "it's getting higher and higher in my list of things", and that "I deal with a lot of off shore people, a lot of visitors coming in and out... they come here and I need to get them somewhere for lunch. Entertainment is an often time overseen element". Despite this, the area is almost completely lacking in them. Thus, amenities do not appear to play as strong a role for firms located in Crestwood. Instead, there appear to be three distinctly different factors that make Crestwood an attractive location compared to a place such as Yaletown: large buildings with large floor plates and room to expand, plentiful parking at a cheap rate, and the overall price for the location, such as rental lease rates.

All of the interviewees highlighted that for the price, Crestwood was a very competitive location given its other features. Grant stated that above all else, price was the number one factor for locating in the office park. He explained "it bought us, we didn't buy it. We were looking and this was among many locations we looked for it had what we needed. It is fairly open...a lot of offices we can occupy, proximity to the communications lines, highways...there were a couple of choices... so the prevailing factor was price. Price was the factor that made it for us". Carolyn, Andrew, and Laura stated that the lower prices found in Crestwood alone will keep the area "in the game" when competing for firms. The question then is what attributes of the location are firms

getting at such a bargain? The answer appears to be plentiful parking and large buildings of high quality.

In terms of buildings, all of Crestwood is considered class A office space, which is defined by Building Owners and Managers Association International (BOMA) as the “most prestigious buildings competing for premier office users with rents above average for the area. Buildings have high quality standard finishes, state of the art systems, exceptional accessibility and a definite market presence” (BOMA, 2010). Andrew stated that the quality of their office space, and the maintenance of that office space, were two of the main features that made Crestwood attractive, alongside its campus style setting and competitive prices. Eric stated that while the building was aging, and the company was starting to consider what options they had, the fact that the building was large and reconfigurable made it attractive, and that it would be difficult to find a comparable building, especially when factoring in the price. Building size and flexibility appear to be major features for Crestwood and locations like it. Crestwood appears to be unique in Metro Vancouver in offering class A office space with such large floor plates that are built in such a way that firms can renovate the inside to suit their needs very easily (see figure 10).



Figure 10 – Crestwood’s larger floor plates with space that is easily renovated is an attractive quality for certain firms (photo credit: Duncan Włodarczak)

It also offers the ability to expand rapidly if need be, but at the moment that is due to the high vacancy rate, since the area itself is considered fully built out. In addition to the interiors being an attractive component, larger buildings like those found in Crestwood do provide the opportunity to do some warehousing and transporting of goods, and are designed with the ability to provide access to trucks, which then have access to major highways that run through Richmond. The zoning of Crestwood allows for the creation of this flex-space and this type of activity, which can be an important feature for certain firms, such as MDA.

The other major factor that makes Crestwood attractive is parking. Crestwood offers roughly three parking stalls per 1000 sq. ft. or 2150 parking stalls (see figure 11),



Figure 11 – Crestwood has plentiful parking for every building. Outside MDA’s office the lot is almost completely full early in the morning (Photo credit: Duncan Wlodarczak

at a cost of \$ 10 per month. With parking stalls costing upwards of \$ 300 per month in downtown Vancouver, that certainly is a competitive advantage. All of the interviewees, including some from Yaletown, highlighted the importance or attractiveness of plentiful parking that was cheap or free. As expected, the automobile is the dominant mode of transportation at Crestwood, according to the interviewees, and as such, Crestwood is considered centrally located. Grant stated that “proximity, for example, is a big thing to me. I have a lot of contractors that live Port Moody all the way down to White Rock, so it’s important to me that they be equidistant to wherever the location is”. Crestwood is situated along the two major highways running through Richmond, in close proximity to the airport, the port, downtown Vancouver, Richmond city centre, and the municipalities south of the Fraser, including Surrey, White Rock, Delta, and Langley. For many employees, Crestwood is attractive as a commuter location (mainly by automobile), since it is central enough that they only have to travel over one bridge (by car), which prevents long commute times, which they, like Yaletown firm employees, do not tolerate.

7: RESILIENT CLUSTERS – THE BASICS

Now that we have reviewed some of the literature examining sustainable, land use planning, economic development, and the high-tech industry, we need to develop a better picture of what all of these things entail on the ground. Furthermore, if we are trying to develop the basics of a more resilient cluster, what factors do high-tech firms themselves consider important features of a given location? If we want to create a resilient cluster, then it needs to fulfil not only urban planning objectives, but also provide the necessary employment opportunities; this means providing the attractive qualities high-tech firms look for in a location. In my literature review I discussed the idea of cluster theory (see Porter, 1990), and the limitations around it. The following sections are not meant to build on Porter's theory in relation to urban economic development theory, nor is it meant to address some of the notable concerns raised with cluster theory (see for example, Martin and Sunley, 2003, Torjman and Leviten-Reid, 2003). Instead, it is designed develop a picture of how cities can develop clusters in a way that create a more resilient land use pattern. It puts a greater focus on how cities can coordinated economic development, in this case attracting high-tech firms, and urban planning objectives in a way that a cluster can maintain its economic advantages while moving cities that pursue this type of development to a more resilient land use pattern. Future research certainly needs to delve deeper into the concerns raised by scholars such as Martin and Sunley and Torjman and Leviten-Reid, and look on how to incorporate the below ideas in a more context specific nature for each city that may follow it.

7.1 Land Use – Smart Growth

Like a smart growth development, a resilient cluster would deviate greatly from a traditional, suburban development pattern. Perhaps the most important factor for a resilient cluster would be the mixing of uses. As stated earlier, I argue that one of the most important factors when developing a community using smart growth, which is often overlooked, is the lack of quality employment opportunities within close proximity. Thus, a resilient cluster needs to provide a good mix of land uses, including residential and commercial, with the provision of quality office space to include opportunities for a variety of firms to locate in the area. Given that smart growth communities also try to discourage the use of the private automobile, a resilient cluster must provide alternative transportation options, such as walking and quality access to public transportation. However, given that the objective of a resilient cluster is to provide employment opportunities, the reality is that local residents may not fill many of the possible job opportunities, and local residents may seek employment elsewhere. Thus, public transit must not only provide mobility within the local community, but must also be connected to the wider, regional public transportation network. Finally, given that this cluster is designed to provide a mix of land uses, including amenities and local services, as well as public transportation for the local community and connections to the regional network, it must provide a sufficient density of residents to support the critical mass needed to provide and support all of these uses. Fortunately, many of these criteria blend well with the requirements of high-tech firms.

7.2 High-Tech Firm Locational Requirements

The most important locational criterion for high tech firms, and perhaps the most obvious one, is the availability of suitable office space. While this may seem too obvious to mention, it is important to note that different firms require different forms of office space. Depending on the type of firm, floor plates may need to range from a few thousand square feet to tens of thousands. Part of the appeal of office parks is the availability of buildings with very large floor plates, which are usually filled by very large and established firms. The price of any office space also has to be reasonable, but price did not seem to be an over-riding factor to those I interviewed. Jessica stated that “our rent is a very small portion of our costs. Our staffing costs are over 80% of our costs. Yes rent is an expensive fixed cost, but it is not the most important fixed cost”. This means that finding a location suitable to employees far outweighs the “good deal” that could be found in an otherwise unattractive location¹⁵. Whatever the size of office space required, it would also need to be equipped with the latest and most update IT (information technology) infrastructure (i.e. reliable, high-speed internet, etc.).

High-tech firms place a high value on the intangible qualities of a given location. All of the interviewees highlighted that amenities played an important role and were a very desirable feature of a location. A location that is accessible to amenities, such as places to eat or coffee shops, were seen as more desirable locations if office space was available. This is largely because such locations are more attractive to employees.

¹⁵ For example, while Grant highlighted that price was the prevailing factor for selecting the firm’s current location, he also explained that his employees’ happiness mattered above all else. He stated that “the two things in my life that are most important are family...and the second is the people that you work with. Doesn’t matter what you do, work is just work, what matters is who you work with...it is extremely important that these guys are happy where they are...” and that “if they tell me ah Grant this Richmond sucks, I’ll go somewhere even if I have to pay more” and “I will pay 3x more if that is what’s going to make them happy”

Amongst the firms I interviewed, the ability to attract talent is the most important objective, and locations that are attractive to prospective and current employees are seen as the best. Areas with a “sense of place” are seen as attractive, but this varies by firm type. It is worth noting that while the firms in Crestwood did highlight that they preferred their current location, they would like to see an increase in the diversity of places to eat in close proximity.

In addition to having lifestyle amenities, locations that provide accessibility to public transportation, particularly quick, direct routes (such as near a rapid transit station) were seen to be extremely advantageous. While some of the interviewees still highlighted the importance of plentiful parking spaces, they also highlighted that having increased access to public transportation would be a significant advantage, and that this was a growing trend. Andrew stated “there has been a huge increase in the importance that companies place on that recently. I’m sure it’s always been important but these days it’s a huge issue. There seems to be almost an irrational importance placed on it”. Start-up firms in particular that are located in Yaletown placed a great deal of emphasis on this. It was also highlighted that being able to use other forms of transportation, be it walking, or notably cycling, was an attractive quality in a location. While it was not a deciding factor, almost all of the interviewees highlighted that this was something that many employees found attractive.

Some firms, depending on the type and size, see it as a major advantage to be located in close proximity to other firms, particularly ones that are similar in business type and size. Grant and Mike both stated that this allows for the exchange of knowledge that can help with problem solving and Grant acknowledged that he does miss that

aspect. He explained that it was not crucial to his business, but he would consider it an advantage to be able to have this more informal exchange of knowledge and noted that was one of the drawbacks of his current location.

Finally, having a high level of accessibility, not just to amenities, but also the employee base and clients, was also highlighted as an important feature of a location. The definition of accessibility varied, quite expectedly, between the firms located in Richmond and those in Yaletown. This is largely because of the difference between accessibility via the automobile and automobile-oriented communities and accessibility via public transportation in a compact community like Yaletown. This different interpretation of the term “accessibility” also helps explain why some firms place a greater emphasis on the availability of plentiful parking. Even in the much more automobile-oriented office park in Richmond, the desire for public transit was still strong and the current property manager is going to supply a private shuttle to take employees from the park to the new Canada line rapid transit station in central Richmond¹⁶. Having public transportation with strong connections to the downtown core and to the airport also provided an attractive advantage for a given location. However, Crestwood was also seen as highly accessible, given that it was well connected to multiple highways and major transportation routes. Once again, the definition of accessibility will vary depending on a firm’s preference, and the employees’ preference, in relation to mode of transportation. Whatever mode of transportation, all of the interviewees highlighted that a long commute was not something staff would tolerate, and although exceptions to this rule do happen, they are very rare.

¹⁶ Since the time of interview, Crestwood has not instituted its private shuttle, intended to run from the office park to Richmond’s Brighthouse Canada line station.

7.3 The Resilient Cluster

When reviewing both the basics of smart growth style communities and the attributes high-tech firms seek in a location, we find that there is a lot of compatibility that allows for mutually beneficial results (see table 3). In addition, the most notable features of a more resilient clusters corresponds well with the main aspects of smart growth communities (see table 4).

Table 3 – High-tech firm locational requirements that correspond with smart growth criteria.

Criteria for Smart Growth	Attractive location requirements for high-tech firms
High densities	Access to housing
Mix of use	Access to amenities
Walkable	Vibrant street life
Public Transit	Access to public transit
"Sense of place"	"Sense of place" / "good vibe"

Table 4 – Resilient cluster criteria.

Resilient Clusters
High densities
Amenities
Walkable
Limited parking
Public transit
Provision of various sized office space

The most obvious element is that smart growth communities have a mix of uses, which provides the possibility to include office space. What needs to be provided, however, is a variety of office types and space, including various sized floor plates, both large and small, if we want to attract a range of firm sizes and types. Furthermore, a mix of uses allows for the provision of a variety of services and amenities. My research has showed that the proximity to amenities such as good restaurants can provide a location with a significant advantage in terms of attracting high-tech firms. This is where a resilient

cluster would further benefit from the mix of uses. In addition to commercial land uses, residential units would be provided in direct proximity to all other land uses, and would be zoned to a high density. Having higher density residential units means that the area would be supported by a permanent client base that can supply the critical mass needed for amenities to justify locating a business or service there. In addition, residents can benefit from having the office space mixed in, as it will supply quality employment opportunities within close proximity. Furthermore, higher densities and a mix of uses have been shown to create more walkable urban environments, which can add to the vibrancy of street life, something that some high-tech firms cite as an attractive quality for their employees.

Finally, and arguably the most crucial element of a resilient cluster, it must be designed in such a manner that use of the personal automobile is greatly discouraged. The degree of importance placed on parking varies by firm size and type, with some looking for locations that provide large amounts of surface parking. Driving as a whole, however, needs to be discouraged in a resilient cluster. While this area may be more walkable than traditional suburban developments, this would not be enough to provide the necessary incentives to decrease car use. This means that a resilient cluster must be well served by public transportation. It would appear all high-tech firms value public transportation, even those that locate in suburban office parks. This means that not only can public transit help create a more attractive location for different types of high-tech firms but it can also help a city reach its GHG reduction goals while decreasing the reliance on fossil fuels. Having public transit that services just the local community is not enough. Virtually all of the high-tech firm interviewees highlighted the importance

of accessibility, such as accessibility to a client base, which likely is not located within close proximity. This means that a resilient cluster should be built in a way that can accommodate public transit that services both the local community, while also connecting well with the regional transportation network. Locations that have access to a regional rapid transit system could provide such a location. This would allow firms to locate within an attractive community outside of the downtown core, providing employment opportunities outside of the core, while preserving access. Once again, the resilient cluster should have the necessary density of residents to justify the provision of public transit, which is particularly important if it needs to justify an extension of a rapid transit system.

8: ANALYSIS OF CASE STUDIES

Now that we have developed a conceptualization of a more resilient high-tech cluster, the next question is to what extent does each case study match or not match the criteria outlined above. Is one model better than the other, and in what ways does each one need to change, if at all?

8.1 Yaletown

As we have seen, Yaletown is a neighbourhood with a mix of uses, including office space and ample amenities such as restaurants, coffee shops, and retail outlets. It provides amenities that are attractive to high-tech employees, as well as those needed to support a more complete community. It has a very high density, with a built form dominated by large residential towers, but also ground oriented town homes, a mix which may promote a more safe and active streetscape. It has good connections to public transit, including fairly good bus services and connections to Vancouver's new rapid transit line, the Canada line, and is in walking distance to the sky train system. In terms of transportation, the most notable element of Yaletown is the very high percentage of trips made on foot, which contributes to a more vibrant street life, and no doubt contributes to its attractive vibe for high-tech firms. Yaletown is also a central location, within walking distance to the downtown core, with its services and clients, the mixed-use, residential neighbourhoods in the West End, Coal Harbour, and the units within

Yaletown itself, and within walking distance to a variety of transportation connections, connecting Yaletown to many cities within Metro Vancouver.

Despite these positive aspects, Yaletown is certainly not without its issues for firms. These can be summarized into two issues: price and space. Yaletown is an expensive place to set up a business, with high property taxes, fairly high business taxes, and high rental rates. Rental rates vary between roughly \$ 30 - \$ 53 per square foot per year. In terms of space, Yaletown does not have much. There is a vacancy rate of about 5%, which is as a land-lords' market. Carolyn explained that there is high and consistent interest in Yaletown, but that they constantly turn people away because there is simply no space. Another issue with the office space in Yaletown is that the buildings that do accommodate office space, vacant or not, are considerably smaller than what some high-tech firms are looking for. As we saw in Crestwood, certain types of firms look for buildings with large floor plates, either because they currently require the space, or because they need room for expansion to one day acquire that space. There are also firms located in Yaletown right now, such as Microsoft, that will pay the price for these larger spaces when available, but Carolyn highlighted that even Microsoft had a very hard time finding the space it required, and took the remaining bit of larger space. The fact that Yaletown is built out also means that if firms that are located there wish to expand, not only will they not be able to find space due to low vacancy rates, but there is also no space to build new buildings if they wanted to. Finally, certain types of firms will shy away from Yaletown due to its higher parking costs and the relatively limited availability of parking, but this issue will be addressed in its own section.

8.2 Crestwood Corporate Centre – East Cambie

Crestwood’s main advantages are almost exactly opposite of those found in Yaletown. In terms of advantages, Crestwood has two major attributes attractive to high-tech firms; space and price. In terms of space, Crestwood has a high vacancy rate (hitting around 30% in the coming few months), large buildings with large floor plates, and thus, room for expansion. While the site itself is built out to capacity, some of the buildings are dated, with a few likely needing to be replaced in the coming few years. Eric and Grant highlighted the importance of having the most up to date infrastructure, which means future tenants may already see the age of the buildings as a negative factor. Eric explained that they are already looking at their options given that the current building they are in is also reaching an age at which it may need extensive renovations. This means there is the possibility for a firm to build its new space to a size and specification that it would like, including possibly increasing the density of the space by increasing its height. The space itself is class A office space, which is important for certain types of firms. In terms of price, Crestwood’s overall rental rates are roughly \$ 30 per square foot per year. Generally, more suburban cities like Richmond have lower property tax rates. Interestingly, Richmond’s rate for residential units is slightly higher than Vancouver, but where Richmond does have the advantage is the rates applied to businesses, which are significantly lower¹⁷. Other advantages for Crestwood include its flexible zoning, which offers “flex space”, meaning it allows both office and some light manufacturing, as well as warehousing opportunities, which is something MDA takes advantage of and

¹⁷ Vancouver’s property tax rate per \$1000 dollars of assessed value for residential is 2.15, whereas Richmond’s is 2.42, which is a slightly higher rate. Vancouver tax rate for business is 9.78, whereas Richmond’s is 8.36. It should be noted that these rates include municipal fees only, not other levies issued on behalf of other levels of government (such as Translink, school districts, etc).

highlighted was important to their business, and that Richmond's economic development officer argues will be important for certain green-tech firms in the future. The location itself is a well landscaped and fairly attractive campus style location, which is important for certain types of firms.

In terms of disadvantages, we can separate them into those related to high-tech firms and those related to more sustainable land use planning. In terms of high-tech firms, Crestwood and its surrounding area lack the amenities all the interviewees highlighted as important, particularly places to eat. Crestwood has poor connections to public transit, and with the new Canada line extending into Richmond, Crestwood's value further decreases in this respect comparative to other potential locations for firms in Richmond. This lack of public transportation and its location more on the periphery of Richmond makes Crestwood almost completely auto-oriented (see figure 12).



Figure 12 – Crestwood is surrounded by some of Richmond's busiest roads and highways. Bikers ride alongside Westminster highway's busy truck traffic. (Photo credit: Duncan Wlodarczak)

If we consider the principles of smart growth, Crestwood is already behind. Crestwood is located in an area that for the most part lacks any mix of different land uses, including almost zero residential, with all the units in East Cambie being located on the opposite side of two highways. This makes the area highly unfriendly to pedestrians, and for the

most part cyclists (see figure 12), though some employees do cycle to work. Crestwood and the entire surrounding area of East Cambie are of a low density, which makes it difficult to support further public transit extensions in the future. Crestwood and the surrounding area lack any street life, are highly unwalkable except for some places within the business park, with no “vibe”. That said, some firms do prefer the more corporate feel a campus style business park offers.

Finally, Crestwood has one disadvantage in terms of creating an area more along the lines of smart growth, which is however an advantage to certain types of high-tech firms. As I explained above, Crestwood’s lack of good connections to public transit, less central location, and low density make it highly automobile oriented. Crestwood itself is well equipped to accommodate this, as it has roughly three parking stalls per 1000 square feet. This plentiful parking is attractive to certain types of high-tech firms, who wish to be able to supply adequate parking for employees and clients. As I stated in my review of Yaletown’s advantages and disadvantages, the issue of parking needs to be addressed in a separate section.

8.3 Parking in Yaletown and Crestwood

Throughout my research, the provision of parking has played an interesting part in achieving a development/community that is more resilient to the coming crises but also designed to be attractive for high-tech firms. For the firms in Yaletown, the lack of parking varied in terms of significance. For start-up firms, it appears to be nearly irrelevant; but for small, medium and large firms, it appears to vary in importance. However, for those wishing to drive, parking can be found if they pay the high price, and as Carolyn said “are willing to walk a bit”. Parking may be limited on site in Yaletown,

but it is available. Carolyn highlighted that many firms do explain that it is an issue, but was unsure how significant it was. Jessica stated that it is an issue for the employees of her firm, but those who want to drive can find parking, and the rest is offset by the fact that transit is well connected and that many employees live downtown. That said it would seem that increasing parking in an area like Yaletown, and perhaps decreasing the price, would contribute to the attractiveness of the location. For Crestwood, the vast majority of employees drive, and there is plenty of parking to accommodate them. Parking stalls are rented out at \$10 per month, so price is not an issue. Eric anecdotally highlighted that parking was in great demand at MDA, and that many employees don't leave for lunch because they are worried about losing their spot. Every interviewee related to Crestwood highlighted at some level the importance of accommodating cars and their drivers with lots of parking. Between Yaletown and Crestwood, parking and accommodating the car seems to play a somewhat important role, but with varying degrees of importance depending on the firm type and location.

Despite this, if we are looking to create a more resilient cluster, one that is prepared to adapt in an age of depleting resources like oil and other fossil fuels, and one that is designed to help a city decrease its contributions to GHG emissions and climate change, accommodating the car and providing a "sea of parking" is certainly something we do not want to encourage. One can provide parking either in the form of large tracts of parking lots, the sea of parking, or by towers of structural parking. Crestwood has just over 2000 parking stalls, which would mean a significant and expensive parkade to construct. That said, large tracts of parking contribute to the sprawling nature of a development, and if we are looking to create a denser neighbourhood that is walkable,

that is not ideal. Tony argued that the provision of parking is almost a chicken and egg situation; do business parks offer so much parking because driving is attractive to high-tech firm employees, or do they offer the parking because they are located in green field sites in low density suburbs with no alternative (such as public transit, let alone walking or cycling)?

Regardless of the reason, I argue that if we want to make a more resilient cluster, we need to begin transitioning away from the automobile. That means we need to rethink how we will accommodate employees' transportation needs. In so doing, a resilient cluster must transition away from the seas of parking we find in places like Crestwood. Future developments must severely restrict the provision of parking and increase the price of what exists. At the same time, cities need to encourage cluster development around public transit. Paired with decreased parking, cities can begin to encourage a modal shift away from cars while still providing viable options for employees. I would argue that the success of Yaletown, despite its high prices and limited supply of parking, provides strong enough evidence that a resilient cluster can accommodate this decrease in car use without reducing its attractiveness.

9: RECOMMENDATIONS

We have now reviewed what a resilient cluster conceptually may look like, and we have reviewed how well both Yaletown and Crestwood match this outline. While in the future cities could consider incorporating these ideas, such a conceptualization is rather unhelpful for current developments like Yaletown and Crestwood. Thus, this next section provides recommendations for future research for both Richmond and Vancouver on what adaptations should be looked at that may assist both Crestwood and Yaletown to increase both their attractiveness to high-tech firms and their resilience to the coming issues we all will face.

9.1 Yaletown

In terms of land use planning, there is little Yaletown can do to become more resilient. It is a high density, mixed use, walkable community with excellent access to public transportation. Where it can improve, however, is its provision of office space, both in quantity, and in size. The *Metro Core Jobs and Land Use Study* conducted by the city found that the Metro Core as a whole was going to fall short in terms of zoned capacity of job space; Yaletown is no exception. The unfortunate situation in Yaletown is that the area is almost completely built out, meaning there is virtually no space to accommodate future development. What little space remains generally goes to residential towers. As such, the city of Vancouver should look to increase office space where possible, such as in the lower floors of residential towers. This is not uncommon, but

Carolyn highlighted that this space is generally much too small and too minimal to have a significant impact of vacancy rates. Providing space for smaller firms can help, particularly for start ups, but only if the price is right. For example, the Vancouver could look to set up an organization similar to *The Hive*, a non-profit organization that is designed to offer a shared space for smaller businesses of varying type and from various sectors but all share a common social and/or sustainability mandate (The Hive, 2010). This means that research needs to be done to find ways to reduce the cost burden placed on start-up firms, such as special exemptions on a percentage of property tax or business tax.

One of the other major shortcomings for Yaletown is that the buildings and floor plates are much too small to accommodate larger firms. This limitation would apply to any highly dense and urban setting. I have found that there are two difficulties with accommodating larger floor plates in such dense urban settings: the argument that large floor plates simply cannot be accommodated in places like Yaletown in a way that blends into the urban fabric, and the argument that developers will not build such sites because it is not economically viable.

In terms of accommodating those spaces, I believe this is simply a perceptual limitation. One would need only to search for the nearest Costco, Whole Foods, or any other large, big box store we find in cities like Vancouver (see figure 13).



Figure 13 – A combination of ‘big box’ stores underneath residential units in Vancouver (Photo credit: Duncan Wlodarczak)

If we look at a building such as the one that accommodates Scotia Bank Theatre, we can see a tenant with a very large floor plate that in my opinion blends well into the rest of the area (see figure 14).



Figure 14 – Scotia Bank Theatre (Vancouver) sits below a residential tower. (Photo credit: Duncan Wlodarczak)

The question of creating such spaces is more of a question of proper urban design and architecture than physical possibilities, but that is for an issue for further research.

In terms of the economic viability of creating such buildings and space, cities need to start finding new and more diverse ways to encourage such development. Several of the interviewees highlighted that high-tech firms are often willing to partner with a developer to build suitable space. While this would certainly be too expensive for start-up and smaller firms, the city of Vancouver could act as a facilitator between prospective high-tech firms and commercial real-estate developers to find the necessary partnerships for those firms that can afford such an investment. My research has found that developers are unwilling to invest heavily in such an expensive development where there is no guarantee of finding a tenant when they can often get 100% pre-sales on residential towers at a much higher value. In addition, the city can and needs to find new and diverse ways to encourage office development. An example can be found in the city of Surrey, where the city created economic investment zones. Within these zones property taxes were waived for 3 years, development cost charges were reduced by 30% while also deferring the payments for a period of time, building permit fees were decreased by 50%, and the approval process was streamlined (which some interviewees highlighted as a major incentive for developers) (City of Surrey, 2009). Vancouver does not have to copy this model, but it provides an example of some economic incentives that can be offered to induce commercial development. In the past, Vancouver has used many incentives to create vibrant communities like Yaletown, now it needs to use the same theory when promoting office development. Further research into finding ways to

encourage office development is crucial for Vancouver's economic vitality and resilience.

Many of the interviewees related to Yaletown spoke of Gastown as the next up and coming area for high-tech firms. In particular, Mike explained that Gastown was very attractive to start up firms due to its vibe, history, and its "grittiness", paired with its high level of amenities and cheaper prices. Both Carolyn and Josh explained that Gastown and its surrounding area is much like Yaletown was when it first became an attractive area for high-tech firms. As such, Gastown and its surrounding area will represent an important area of Vancouver to consider as future development occurs. If the city wishes to encourage this area as a destination for high-tech firms, then it needs to ensure a sufficient zoned capacity of office space. Given that the area is currently seen as a good area for start-up firms, there should be sufficient space for these firms, but also enough space to allow for growth and expansion of firms. I also believe that if the city does want to encourage office development, it should look for ways to encourage the creation of large floor plates and help work with developers to find tenants for that space.

Gastown's surrounding area, however, is one that deserves special attention, given that Vancouver's downtown eastside (DTES) is part of this area. If Gastown is headed for a development path similar to that of Yaletown, the DTES could be at serious risk to spill over development or gentrification. Given it is an area that is home to some of the most marginalized and impoverished areas in Canada, allowing rapid development like what was experienced in Yaletown would have serious social ramifications. While delving into specific recommendations on how to approach development in the DTES is far beyond the scope of this project, it is certainly worth noting that promoting Yaletown

type development in the DTES is not in the best interest of the community that currently resides there.

9.2 Crestwood

Crestwood's limitations can be placed into two major categories: it is auto-oriented, and it lacks density and a mix of uses. Without increased densities and a mix of uses, Crestwood will continue to lack the amenities desired by many types of high-tech firms, the density of people needed to support public transit, and in short, any of the principles needed to create a smart growth style community. It is unlikely that Crestwood will ever possess any of these qualities. That means that while Crestwood may continue to attract certain high-tech firms, it will continue to be auto-oriented, and as such, continue to contribute to Richmond's overall GHG emissions. What can Crestwood and Richmond do then? I believe there are two main options that could be researched and considered.

9.2.1 Option # 1

The city of Richmond can look to discourage office oriented high-tech firms from locating in Crestwood, and find ways to encourage them to locate in Richmond's city centre. At the same time, Richmond, like Vancouver, could research how to act as a partner/facilitator with Crestwood's owner (GWL) to find the types of firms that require the "flex space" Crestwood offers. Metro Vancouver has already begun arguing for the protection of industrial land in the region (Metro Vancouver, 2009). Having Crestwood act as more of an office park means a potential loss of industrial land for Richmond, or more specific to Crestwood, the potential loss of the flex space that allows certain types

of high-tech firms to house their light manufacturing and warehousing components. Clearly GWL wants its vacancy rate to be lowered, and not coerce all current and future tenants out of the space. As such, Richmond would need research on how best to act as a partner with GWL and Crestwood to ensure tenancy for the site, and ensure that the firms that absolutely cannot locate in the city centre, which is slated for massive redevelopment and densification along the Canada line, are the firms locating in this space. While this would continue the automobile dependence of the area, Richmond would at least be maximizing its use of space, and encouraging those firms that can locate in the city centre to do so, helping creating the more complete community it wants. The city could conduct research into the recommendations I mentioned above for Vancouver and Yaletown to encourage adequate space in the city centre, but the focus of my paper is not Richmond's city centre, and as such, I will not look at that area in detail.

9.2.2 Option #2

Crestwood is class A office space, providing the larger floor plates and buildings required by some firms. It represents a significant portion of Richmond's available office space, and its zoning that allows flex space will be useful in the future. As such, while it may be a long term vision, Richmond should begin preparing to connect Crestwood to the greater public transportation network. It is important to note that while it may lack amenities, Crestwood is attractive to certain types of firms, and there is nothing inherently wrong with developments like Crestwood except for the fact they are

completely auto-oriented. While the owners of Crestwood intend¹⁸ to begin a shuttle service to and from the Canada line (see figure 15), it will not be enough.



Figure 15 – Crestwood’s new tenant shuttle service will run from the business park to Richmond’s Brighthouse Canada line station with no stops (photo credit: Duncan Włodarczak).

Crestwood will continue to be auto-oriented and contribute to GHG emissions, or it will become less attractive as fuel prices raise the costs of driving. As such, perhaps the single most important element to help such a place adapt is providing it with a high quality transit connection, such as a rapid transit station or a street car station. Taking the example of a street car, Richmond could run a street car from the city centre, near a Canada line station, along Westminister Highway and out to the Hamilton neighbourhood of the city. While Crestwood likely cannot warrant such an extension, connecting the street car to Hamilton, and by extension, New Westminister, Richmond could connect Crestwood to the transit network while also connecting more of Richmond to the city centre and the Canada line. Research on how to connect Richmond laterally via public

¹⁸ Since my interview with Andrew, Crestwood has now begun running its shuttle service from Crestwood to the Canada line.

transit makes sense for many of the communities, including East Cambie, Hamilton, and the rest of East Richmond. From a regional perspective, it may act as first connection that better integrates Richmond, Surrey, Delta, New Westminster, and possibly White Rock, or in other words, begin providing high quality transit south of the Fraser. The area around Crestwood is also a major employment centre for Richmond, but it will continue either to contribute to the climate change issue via its automobile oriented development pattern, or it will not survive a time of fossil fuel depletion and rising fuel costs. That means it would also benefit from the street car connection, and residents of Richmond would benefit by connecting to possible areas of employment, including the unusual circumstance and opportunity of taking public transit to industrial areas.

Crestwood probably cannot introduce a mix of uses, such as residential, nor should it if the city would like to maintain industrial space (not office space). That may increase property values in a way that could price out the industrial and flex space needed for certain types of manufacturing that Richmond may need to accommodate in the future. Richmond also wants to preserve all of its remaining farmland, as it should. This means Richmond needs to hold onto its remaining industrial land. Acting as a single point along a rapid transit line, rather than the end would likely increase the opportunities for the construction of such a public transit connection. This would help protect employment space, industrial space, and farmland while decreasing car use. Future research on the area must look at what new and innovated ways can help fund and construct such a transportation line, whatever it may look like.

9.3 Long Term Recommendations and Planning for Resilient Clusters

In the short term, I have recommended areas of research into methods of adaptation for Yaletown and Crestwood. In the future, more developments for high-tech firms will likely be built, particularly as cities, regions, and countries continue to promote green-tech/sector jobs similar to high-tech firms¹⁹. Pulling out of my two case studies, I believe cities can still utilize each model. Intensive urban amenity parks for accommodating firms within the urban fabric is certainly possible, Yaletown proves that. Future development may occur in neighbourhoods like Gastown. As cities try to accommodate future growth, such areas can focus more on smaller spaces for start-up and small sized firms, but where possible, cities should also research to find where office's with larger floor plates can be accommodated. Such spaces can either accommodate expansion of smaller firms, or larger firms should they need to locate there. While prices will always be high, especially for larger buildings, based on the firms I interviewed, there will always be some firms will be willing to pay the price for those locations. Future research should also be conducted on how best to accommodate these spaces while also looking to how to ensure smaller firms can avoid being priced out.

The single use office/business parks or campus style developments that are built solely for the car cannot be a part of the future, either from a climate change perspective or from a depleting resource perspective. That said, office park style developments can be adapted and accommodated if two major things change. First, any development needs

¹⁹ Josh stated that as Vancouver continues promote its 'Green Capital Brand', and looks to attract green-tech firms, it will need to consider the types of location factors that make places like Yaletown and Gastown attractive. He argued that green-tech firm employees are highly talented/skilled and that being able to create areas that are attractive to that type of employee while also providing the necessary space for those firms will continue to be an important component of the city's economic competitiveness in that sector.

to be placed on a transit line. Like Crestwood sits in between Richmond city centre and Hamilton/New Westminster, future office parks can sit in the middle of a longer transit network, preferably a rapid transit network like the Canada line. Second, the single use zoning, at least for office parks, must no longer be allowed. Office space can be accommodated into a mixed-use neighbourhood; Yaletown provides good evidence of that. If it is, the area will also have higher densities of residential units and other land uses, providing and supporting amenities, which are desired by at least all of the high-tech firms I interviewed. Furthermore, the higher densities should create a stronger justification for public transit, and the office space, along with other uses, ensures the possibility of an adequate supply of employment for local residents, or residents along the transit line.

That said, places like Metro Vancouver will also need to accommodate light industrial, or heavy industrial, and firms will require flex space like Crestwood or fully fledged industrial space. The same principle applies to these spaces too; such new developments need to be placed along a transit line to ensure access to employment without the car. Cities can begin to research ways to develop eco-industrial parks to further increase the resilience of this areas, and further research needs to be conducted to provide recommendations to how places like Richmond and Vancouver, as well as Metro Vancouver, can create these spaces in conjunction with the public transportation network.

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