Prosperity through *Reuse*?

Examining the Adaptive Reuse of Industrial Buildings in Kitchener's Central, Core and Suburban Neighbourhoods

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Abstract

Deindustrialization and globalization have resulted in the closure of long-standing industrial employers, while consequently changing the demand for the spaces they once occupied. This study examined the characteristics involved in an adaptive reuse project by focusing on eight (8) former industrial sites throughout the City of Kitchener and the effectiveness of policies intended to promote their redevelopment. More specifically, this study examined which factors encouraged and inhibited the adaptive reuse of former industrial buildings in Kitchener. A completion of the literature review revealed that there is ambiguity in the way adaptive reuse is perceived by developers and in the dominant characteristics that guide their redevelopment. Research methods included: undertaking frequent site visits to measure a building's change; interviewing eight (8) key informants involved in a respective site's transformation; a review of policy related to adaptive reuse and brownfield redevelopment; the review of building permits issued as part of an adaptive reuse project; and, the retrieval of archival material. This study found that location served as the catalyst for the redevelopment of former industrial sites in Kitchener. In spite of Kitchener's success in repurposing its industrial building stock, greater attention must be allocated towards the implications of a rapidly transforming employment base.

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I express my sincere gratitude to all those who took time out of their busy day to sit down and talk to me about their knowledge of adaptive reuse and the City of Kitchener. You helped transform a mutual interest of adaptive reuse and Kitchener's rich industrial history into tangible research that I hope will complement future research and enhance people's knowledge in this space.

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Chapter 1: Introduction

1.1 Context

Kitchener's economy has long relied on the success of manufacturing. With increasing global competitiveness, many manufacturing firms have since ceased operation altogether, or faded into the background of Kitchener's now diversified economy. While the physical remnants of these sites have largely been demolished (e.g. Uniroyal Tire, Schneiders, Budd Automotive), others have found new purpose through unique projects that place value on their industrial history. This phenomenon is known as adaptive reuse, whereby the intended use of a building has become obsolete and has found new purpose, all the while retaining much of the original structure (Bullen, 2007; Burchell & Listokin, 1981; Smith, Conejos, & Langston, 2015). Kitchener's industrial history has manifested into a considerable inventory of these buildings, each with unique variations of adaptive reuse and easing the transition away from industry.

Kitchener has largely avoided the effects of deindustrialization, including population decline (Hackworth, 2016). Instead, the census metropolitan area (CMA) of Kitchener-Cambridge-Waterloo continues to experience rapid population growth – seeing the second largest annual populations gains in Canada at 2.6% annually (Government of Canada, 2019). Early planning policies implemented by the City of Kitchener focused their attention on addressing other effects of deindustrialization within the downtown (e.g. abandonment), through policies such as the Adaptive Reuse Community Improvement Plan, which provided incentives and grants until 2013 for developers to bring new life to run-down sites. However, these policies were limited to sites located within the area defined as the core or central neighbourhoods in the City of Kitchener Official Plan. As deindustrialization has begun to spread to the outskirts of the

city, large employers closed for good, and these sites required new tenants. The share of industrial employment in Kitchener has continued to decline, resulting in few tenants who require such large spaces on the city's outskirts. There are also core differences between sites located within the central and suburban neighbourhoods such as architectural value, proximity to transit and other services which have made many sites located in the downtown attractive for up-scale condo or loft developments. At the same time, many of the industrial buildings located in the city's urban neighbourhoods were constructed in mid 1900's and are defined by large, single-storey plants on the outskirts of the city, away from non-industrial uses, limiting their prospects for redevelopment.

This study examines the characteristics involved in adaptive research projects within Kitchener, with a focus on eight former industrial sites and examines how they have been repurposed in a new economy.

1.2 Purpose & Objectives

The purpose of this study is to determine what characteristics are involved in adaptive reuse projects in the City of Kitchener through examining the core differences in the prospects of a site's eligibility for reuse based on location. The expected result of this study is that sites on the urban periphery will be more limited in terms of the types of adaptive reuse projects observed as a result of zoning limitations, surrounding land uses and poor public transportation access. In contrast, it is anticipated legacy sites in the central neighbourhoods are more suited for residential or office developments, which rely on a strong access to transit and other proximity to other amenities.

This research is guided by several objectives. First, to better understand how to encourage the adaptive reuse of former industrial sites that are not prime candidates for adaptive reuse. Second, to generate findings that help to expand the policy direction and resources aimed at encouraging adaptive reuse projects outside of urban cores. Third, to highlight successful adaptive reuse projects in Kitchener as a model to be emulated in other jurisdictions. The fourth and final objective of this study is to identify which factors are most valued by developers and planners when considering adaptive reuse projects.

1.3 Research Questions

This study revolves around one central research question:

1. What factors encourage and inhibit adaptive reuse of former industrial buildings in Kitchener?
    i. Does a site's candidacy for adaptive reuse vary based on location?
    ii. What is the most influential factor for developers who undertake adaptive reuse?
    iii. Are there any improvements that can be made to encourage developers to adaptively reuse rather than build new?

1.4 Thesis Outline

This thesis is subdivided into six chapters. The **second chapter** of this thesis highlights previous research on deindustrialization and its impacts, while examining the role of adaptive reuse as a response to this structural shift in the economy. The **third chapter** provides details

into the research methods that were utilized to address the research questions identified through the review of literature; this includes varying perspectives on determining factors when considering adaptive reuse versus new build. The **fourth chapter** provides a background on the selected study area of Kitchener, Ontario, including the City's shift away from manufacturing towards more knowledge-based industries and the closure of large, legacy manufacturers. The **fifth chapter** provides an analysis of the findings generated through semi-structured interviews of key informants, in addition to case study findings detailing the site's history as a manufacturer as well as its new use. The **sixth** and final chapter, summarizes the key findings, while also addressing limitations of this study and identifying areas of future research.

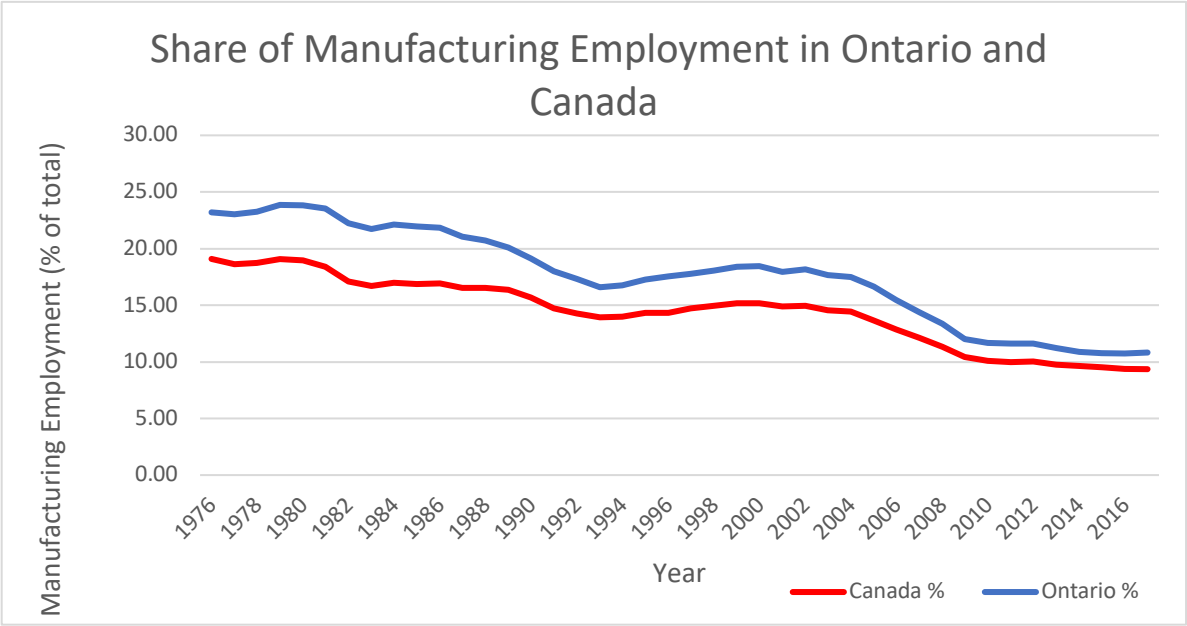
Chapter 2: Literature Review

This chapter explores the structural change in the economy associated with deindustrialization, and its impacts on the physical use of former industrial spaces. This section covers several themes related to deindustrialization, and how it relates to individual agents, including the relationship between deindustrialization and globalization; the impacts of deindustrialization on the economy and labour market; the future of manufacturing; and, the implications for adaptive reuse.

2.1 Introduction

Manufacturing was once a primary employer in advanced economies, providing employment opportunities through direct and indirect openings, regardless of their educational background. With the onset of globalization and related factors, advanced economies have been undergoing a transition to a knowledge-based economy, accompanied by a steady deindustrialization and subsequent economic restructuring (Filion, Moos, Vinodrai, & Walker, 2015). Deindustrialization is defined as a decline in manufacturing employment, often followed by a shift to jobs in the service industry (Lever, 1991). Deindustrialization has affected the labour market, as well as the economic outlook for advanced economies. Within Canada, Ontario has been one of the hardest hit provinces by this structural change in the economy (see Figure 2-1). Cities across Ontario once prospered under their industrial based economies, providing quality employment to a large segment of the population. Kitchener, Ontario is a classic example of a once mighty industry powerhouse, with those directly employed in manufacturing falling from 18.8% in 1986, to only 9.6% in 2016 (Statistics Canada, 2016).

Figure 2-1: Share of Manufacturing Employment in Canada



Source: Statistics Canada (2016), Catalogue No. 75-001-X, with Author's Calculations.

2.2 Research Topic

Deindustrialization is not unique to Kitchener, nor is it unique to Ontario or Canada. Advanced economies such as those in the United States, Britain and other western countries exhibit similar patterns. In 1979, nearly 20 million Americans were directly employed in the United States' manufacturing sector, by 2009 that number fell dramatically to roughly 12 million (Bronstein, 2009). Deindustrialization in advanced countries has had profound impacts on economies that once relied on manufacturing for direct employment, and for indirect spinoffs (e.g. upstream and downstream supply chain activities). Largely due to the influence of unionization (High & Lewis, 2007; Kollmeyer, 2018), manufacturing jobs are typically high-paying, especially for those who lack formal education; a phenomena not replicated in other sectors of the economy (e.g. services) (Hersh & Weller, 2003). In recent years, Ontario has experienced the loss of major manufacturers, including the 2019 planned shutdown of General Motors in Oshawa (Vellequette, 2018) and the downsizing of several others. This

deindustrialization leads to the loss of manufacturing jobs, impacts income distributions, affects employment trends, among many other consequences.

There are personal reasons for selecting this topic. Growing up in Kitchener, Ontario, I have witnessed an economy that relied on manufacturing evolve in favour of growing larger technology and service industries. In fact, Kitchener's reliance on manufacturing is recognized as part of the city's identity, reflected in its former corporate motto: "*Prosperity through Industry*" (Wallace, 1984), and more recently in its economic development strategy titled *Make it Kitchener (City of Kitchener, 2015).* This topic is of general importance because in the last several decades, cities in advanced economies have lost a significant amount of industry, with a large portion of these firms employing several thousand people. This is evident in Kitchener through the loss of large employers in the last two decades; among the top eight employers in 2004 (Malone-Wright, Sloan, Boutilier, & Morgan, 2010), five have since closed their doors. This includes employers such as Uniroyal, which closed in 2006 (CBC News, 2006), Schneiders in 2015 (Mercer, 2015a) and Lear Corporation in 2015 (Mercer, 2015c). As a result, it is important to study the impacts of these changes on the regional economy and the physical remnants they have left behind.

The remainder of this chapter reviews literature on deindustrialization, subdivided into five relevant themes: Deindustrialization and Globalization, Economic Factors, Labour Market, Advanced Manufacturing and Adaptive Reuse. The purpose of this section is to outline key findings while simultaneously identifying gaps in the research and formulating a research question.

2.3 History of Deindustrialization Research

Early industrialist forms of manufacturing are largely characterized by what is referred to as 'Fordism'. Fordism standardized a set of mass production practices instituted by Henry Ford that were first applied to the automotive in the early 20th century (Bonanno & Constance, 2001; Filion et al., 2015). This style of production was embraced through centralised pockets of industry and allowed for many cities to develop their economies through a reliance on manufacturing (Florida, 2017). Beginning in the 1960's, increasing competition and declining profits, combined with rising inflation helped contribute to a decentralization of manufacturing in industrialized capitalist societies (Filion et al., 2015; Tauss, 2012). This marked entrance into what is referred to as post-Fordism; which saw a displacement of mass production towards more flexible forms of assembly and a rise of service based industries (Filion et al., 2015; Vallas, 1999).

The further advancement of technology has marked a shift into the post-industrialist era, whereby there is a shift away from industry and many labour intensive tasks that remain have been replaced by machinery, consequently reducing the demand for unskilled labour (Florida, 2017; Marsh, 2012). In this post-industrialist economy, advanced economies held an early competitive advantage, possessing existing technological advantages that outweighed the consequence of high wages; however, this competitive advantage disappeared as advanced economies failed to adapt (Storper, 2013). In contemporary literature, manufacturing is still examined through the lens of mass production and assembly lines, characteristic of the post-war, Fordist period. This has severe implications on the policy discussions surrounding

deindustrialization which reflect an older style of industry hardly present in advanced economies today (Stangler & Maxwell, 2012).

The loss of industry and shift to a more knowledge-based economy has been criticized by some as marking the loss of an authentic economy that produced tangible goods, to one based on a knowledge economy (Heying, 2010). This knowledge-based economy is one that relies on an educated and highly-skilled workforce to promote economic growth through the use of human capital and technology (Barkhordari, Fattahi, & Azimi, 2018). In advanced economies, this has occurred simultaneously to a rise in service-based industries and a decline in traditional manufacturing (Buera & Kaboski, 2012). The economic benefit of this labour market shift has not been reciprocal, leading to suggestions that this new economy has failed to ensure those affected have been afforded new opportunities (Christopherson, 2009).

The economic resilience of cities who underwent heavy deindustrialization and a shift to a more knowledge based economy has become of particular interest to regional analysts and economic geographers (Martin, 2012). Coinciding with this interest, historians such as Cowie and Heathcott published *Beyond the Ruins* (2003), which called for the scope surrounding deindustrialization to be extended outside the confines of plant shutdowns and industrial nostalgia to focus on the related consequences (High, 2013). After decades of failing to receive recognition for its economic importance, addressing deindustrialization as critical for understanding the phenomenon and reviving post-industrial economies (Friedman & Byron, 2012).

2.4 Deindustrialization and Globalization

Globalization is the process whereby there is a rapid growth in world trade, foreign direct investment, coupled with the cross border trade of goods and services (Alderson & Nielsen, 2002; Lee, 1996; Whitford, 2005), and often characterized as beginning in 2001 with the inclusion of China in the World Trade Organization (Rubin, 2018). Globalization and deindustrialization are often discussed together because of the significant effect that neoliberalism has had on advanced economies that rely on industry as their primary economic driver. Neoliberalism's signature laissez-faire characteristics of a free market economy (Bogliaccini, 2013), has idly allowed for the wholesale shift of labour intensive manufacturing through outsourcing to more cost efficient areas (Whitford, 2005). In the last half-century, this laissez-faire approach has been the dominant view among economists in North America, allowing businesses to operate freely through little regulation in an attempt to encourage investment (Pollin & Baker, 2010).

Such liberalization has allowed multinational companies to invest abroad in developing countries through direct investments in search of lowering operating costs, thereby exacerbating and accelerating the process of deindustrialization (Alderson & Nielsen, 2002; Lee, 1996; Porter, 1998) and deepening income inequality (Baugh & Yudken, 2006; Florida, 2017; Stokes, 2018). This shift has been enabled by the ease of transportation of goods and communications brought on by globalization and liberalization of markets (Porter, 1998). Direct investment, also referred to as outward forward direct investment, is often focused on financing the replacement of low skill processes in their current domestic operation – a process of reallocating capital that

effectively exports these manufacturing jobs to developing countries (Pradhan, 2017; Tang & Altshuler, 2015).

The problem of shifting direct investments was first brought to light by the 1982 book: *The Deindustrialization of America*, which spawned political movements against the flight of capital (Bluestone & Harrison, 1982; High, 2013). The problems associated with capital flight worsened, paired with a growing dependence on trade with developing countries, accounting for 29% of manufactured goods in the United States in 1978, growing to 36.4% by just 1990 (Sachs, Shatz, Deardorff, & Hall, 1994). The ensuing globalization has disturbed longstanding connections between cities and local industries. As a result, it has been argued that countries are no longer able to build up their economies around traditional industrial activity that has historically spawned local economic development and instead must search for alternatives (Florida, 2017).

The increasingly globalized market has led to an increasing emergence of multinational corporations, defined as businesses that have facilities in countries other than its home country (Drache, 1989; Rubin, 2018; Staudohar & Brown, 1987). Globalization has severely affected the survival of the international divisions of major manufacturing firms. In periods of economic downturn – e.g. the 2008 recession – American multinational corporations often ceased or scaled down their Canadian operations, choosing to layoff Canadian workers in favour of sustaining their domestic workforce (High, 2013). Moreover, the multinationalism of a manufacturing firm not only makes it easier to scale down production during turbulent times, but it also allows firms to expand easily into overseas markets where the cost of operating is much lower. This consequently has helped to erase the previously existing spatial and physical barriers that protected domestic labour markets from foreign competition (Alderson & Nielsen, 2002). In the

Canadian context, this has exacerbated worries over the foreign ownership of their economies which, in turn, had exposed insecurities in the survival of foreign owned branches, not expressed by domestic firms (High, 2013).

It is established that advanced economies such as the United States possess major overall trade deficits, with manufacturing representing a majority of such deficit (Hersh & Weller, 2003). In contrast, emerging economies such as China possess trade surpluses, holding an overall trade surplus $140 billion with the United States alone (Mutikani, 2019). This sharp inequality has been attributed to globalization and the subsequent rise in international trade and free trade agreements (Pierce & Scott, 2012). In the North American context, this means an increasing trading relationship between Global North and Global South. Most notably, this has been highlighted by the 1994 North American Free Trade Agreement ("NAFTA") signed between Canada, the United States and Mexico. Besides removing tariffs on a majority of goods, NAFTA also lifted significant barriers to investment, helping to more than triple the United States' trade with Canada and Mexico (Villareal & Fergusson, 2017).

Through the initiation of free trade agreements such as NAFTA with lower emerging economies such as Mexico, Canadian and American labour-intensive industries such as manufacturing have been heavily impacted. In the years immediately following the ratification of the deal, the removal and lowering of tariffs appears to have resulted in an early net negative impact on employment levels in the United States and Canada (Gaston & Trefler, 1997). Since its ratification, it is estimated that NAFTA has resulted in the net loss of 400,000 Canadian jobs through increased investments in Mexican industries (Blawatt, 2018). This by-product of globalization has adversely affected the wages of manufacturing workers in advanced economies

and has been blamed by politicians in the United States for decimating the middle class (Irwin, 2017).

After the ratification of NAFTA, in the early 2000's, Ontario produced more vehicles than any other jurisdiction in North America, losing the title in 2013 (Pender, 2017a). With the announced of closures of Oshawa's General Motors plant by 2019 (Vellequette, 2018), the winding down of the automotive sector in a city once referred to as the "Automotive Capital of Canada" (Macaluso, 2012), represents a larger Canadian sector of the economy that continues to see its workforce evolve. There are fears that Canada's automotive sector will follow a trajectory similar to Australia's, which saw three global automakers cease operations in 2017 (Stanford, 2017). Canada's presence in free-trade agreements with low-cost markets such as the Trans Pacific Partnership ("TPP") and a growing discussions for free trade between Canada and China would exacerbate deindustrialization, decimating production and employment in goods industries (Rubin, 2018).

With Canada and the United States holding the world's largest bi-lateral trading relationship (Hadfield & Potter, 2017), the future of Canada's labour intensive automotive industry appears to weigh heavily on the success of the renegotiation of NAFTA, which has produced a new agreement known as the United States-Mexico-Canada Agreement ("USMCA"), also referred to as NAFTA 2.0. The new trade agreement saw benefits to Canadian and American manufacturing, at the expense of concessions in other sectors, namely agriculture (Campbell, 2018). Under new rules, cars that move across North American borders need to contain a minimum 75% of North American content without facing tariffs, up from the previous 62.5% (Lemieux, 2018). Despite these changes, Canada's gains in manufacturing and their

retention of cultural industries has been seen more as a rebranding, rather than a substantive change that will reinstate reciprocal trade between the three countries (Velut, 2018).

2.5 Economic Factors

The economic importance of industrial activities such as manufacturing is well documented and is often cited as fundamental to growth in other sectors. Manufacturing often offers stable growth potential through the creation of a supply chain, industries that are created or supported by the presence of one or many manufacturing firms (Chapple, 2014). This includes other manufactured goods such as complementary materials, as well as utilities, transportation and other ancillary services while also providing a tax base that further supports the economy through public sector employment. In addition to generating tax revenue, manufacturing also creates well-paying jobs, which guarantee a high standard of living for families in the working class (Chapple, 2014; Marsh, 2012). Through this multiplier effect, a single manufacturing job creates as many as four other jobs (Baugh & Yudken, 2006), with heavier industries such auto manufacturing and steel, creating as many as 6.9 other jobs in related trades such as parts producers and transportation industries (Hersh & Weller, 2003).

As deindustrialization has continued to result in the closure of large industrial plants, older cities throughout the United States and Canada have seen large increases in vacant or underutilized factories. Until recently, accessing detailed data regarding vacant properties was difficult and often expensive (Eppig & Brachman, 2014). However, one 2006 study revealed that between 1999-2006, 40000 plants closed in the United States alone (Baugh & Yudken, 2006). Despite many organizational similarities, the United States and Canada are affected by plant closures in very different ways. American cities such as Cleveland and Detroit contain thousands

of vacant plants, while in the Canadian context there is no evidence of a similar magnitude of plant abandonment in southern Ontario (Hackworth, 2016). Not only have Canadian cities avoided the main causes of land abandonment seen in the United States such as population decline and racialization, but their losses have been overshadowed by significant growth in other areas, namely in the service industry and Information Communication Technologies ("ICT") (Barkhordari et al., 2018). This is despite major, sustained losses in manufacturing, seeing a decline from 19.9% in 1976, to 9.09% in 2016 (Statistics Canada, 2016).

Research into the closure of these plants has suggested that the impacts generated by a closure are not only immediate, but can be long term and difficult to reverse. When a plant closes in a small town, it has immediate impacts on the local tax base, resulting in a reduction in public services and other amenities (Hackworth, 2016; Jablonsky, 2018). This impact is most prominent in the United States, where those who are financially able, will relocate to the suburbs or other areas where there are better public services, further contributing to a hollowing out of these small town areas (Florida, 2017; Hackworth, 2016). In addition to a weakened tax base, plant closures also impact the skillset of the local labour force. Many with tangible skills will often move in search of better jobs, while those who remain become underutilized and therefore impacting their potential for future growth and innovation capacity (Doussard & Schrock, 2015). The same degree of population loss is not seen in Canada, while overall manufacturing losses in Ontario were lower than American state figures; cities such as Kitchener experienced a 350% increase in its population from 1951-2006 (Hackworth, 2016).

Policies such as smart growth, which encourages mixed-use developments, as well as diverse housing and transportation options, have resulted in mounting pressures from developers to convert industrial land to mixed use or residential uses (Chapple, 2014). Industrial lands are

often seen as prime areas for redevelopment due to their lack of traffic congestion and marginal conflict with other nearby land uses (Howland, 2010). Therefore, the redevelopment of these former industrial sites is often seen as crucial for the creation of more livable communities by advocates of smart growth (Bronstein, 2009). Similarly, former industrial sites, particularly those located within the urban core, are at the greatest risk of being rezoned in an attempt to attract or retain non-industrial businesses that would otherwise locate in the urban periphery (Chapple, 2014). This has created an apparent divide in cities that seek to preserve industry, and those who advocate for the shift to knowledge intensive sectors (Clarke, Martin, & Tyler, 2016).

2.6 Labour Market

There is substantial evidence that deindustrialization affects the labour market, specifically through an increase in income inequality (Alderson & Nielsen, 2002; Breau, 2007; Bronstein, 2009; Lee, 1996; Staudohar & Brown, 1987; Wood, 1995). From 1990-2000, provinces such as Ontario, which are manufacturing intensive economies, saw their inequality levels rise 9.7% (Breau, 2007). Since then, income inequality levels have continued to increase at the fastest rate in Ontario compared with other provinces (Sutton, 2016). Despite occurring contemporaneously, it is difficult to establish a direct causal link between deindustrialization and rising income inequality. Nonetheless, many scholars attribute rising inequality levels to the erosion of manufacturing (Breau, 2007; Staudohar & Brown, 1987; Wood, 1995). This is largely a result of the reputation of manufacturing jobs as being synonymous with high wages and providing a path to the middle class often without higher education (Baugh & Yudken, 2006).

The sustained decline in manufacturing employment in advanced economies has been countered by a significant rise in employment in the service sector (Buera & Kaboski, 2012;

Florida, 2017; Rowthorn & Ramaswamy, 1997). The Census Metropolitan Area ("CMA") of Kitchener-Waterloo-Cambridge has experienced such a shift, seeing employment in service-based industries rise from 44,000 in 2001, to roughly 70,000 in 2018 (Region of Waterloo, 2018b). There remains disagreement about whether this transition is a cause for celebration or the signaling of an alarming trend. The automation of agriculture is often used to justify a declining manufacturing sector. Scholars argue that the automation and loss of employment in manufacturing represents a transition from manufacturing to service, similar to a shift from agriculture to manufacturing seen in the 20th century (Marsh, 2012).

When manufacturing jobs disappear, there are implications for those remaining in the labour market. Early studies on the impacts of deindustrialization have revealed that those who lose their jobs in manufacturing continue to be financially disadvantaged for years to come, with ex-autoworkers making up to 43% less than they did previously (Bluestone & Harrison, 1982; Staudohar & Brown, 1987). More recent studies have confirmed these claims, finding that jobs in manufacturing, particularly those low-skill in nature, have seen stagnant wage growth compared to other sectors. (Doussard, Peck, & Theodore, 2009; Kollmeyer, 2018). This has been attributed to a reduced demand for low-skilled labour through increased international competition and therefore a relative decline in earnings (Alderson & Nielsen, 2002; Breau, 2007). These employment patterns result in many of the poor to become segregated in the Rustbelt metros of the United States and Canada (Florida, 2017).

The demand for unskilled labour has been further reduced by automation and high-tech, seen as the successors to traditional manufacturing and referred to as the "New Industrial Revolution" (Marsh, 2012). Technical change is often seen as favouring high-skilled workers, through reducing the demand for low-skilled workers and increasing the high-skill wage

premium (Hémous & Olsen, 2016). Industries such as automobile manufacturing, known as being high paying positions, have become less labour intensive and rely more on automation to complete a variety of tasks once completed by low-skill labour (Friedman & Byron, 2012).

2.7 Advanced Manufacturing

The availability of robotics continues to improve, while their cost has decreased by half (Graetz & Michaels, 2018). With the greater availability of robotics, there are predictions that 47% of all employment is at risk of automation in the next 10-20 years (Frey & Osborne, 2017). This automation has resulted the replacement of routine tasks, often completed by low-skill labour, deepening income inequality of this group (Florida, 2017). However, the emergence of automation in manufacturing has been identified as an opportunity for advanced economies to regain a competitive advantage against emerging economies with a surplus of low-skilled, low-cost labour (Boothe, 2015). In former manufacturing hubs such as Kitchener, investment from the automotive sector has not disappeared, it has evolved; large automakers such as General Motors are launching new projects such as the Maven project, a keyless rideshare service (Layson, 2017).

In spite of this, the overall number of people employed through manufacturing is set to continually decline, and many of the jobs that remain will be relatively higher skilled than those seen in the traditional forms of manufacturing (Autor, Levy, & Murnane, 2003; Marsh, 2012). Consequently, there are fears that increases in automation will further reduce demands for unskilled labour (Autor, Levy, & Murnane, 2003; Graetz & Michaels, 2018). Despite uncertainty surrounding their overall impact (Sachs, Benzell, & LaGarda, 2015), some studies claim that the quality, not quantity of jobs will be affected (Autor, 2015).

This growth of new technologies, coupled with various social and political pressures, has facilitated an economic rebound of former industrial hubs (Hobor, 2012). In recent years, this has manifested in a tangible reshoring of manufacturing jobs, with an estimated overall increase of 3 million new jobs in the United States by 2020 (Marsh, 2012). This apparent resurgence of manufacturing has not been identical to its labour-intensive predecessor, rather a shift to more automated forms, also referred to as advanced manufacturing. Advanced manufacturing lacks a clear definition (Panchak, 2012), with various definitions discussing an integration of modern technologies such as computer-aided forms of manufacturing that automates much of the process (Kumar, Mital, & Pennathur, 2016). There has been caution expressed in loosely defining advanced manufacturing, citing that it will lead to further missed opportunities (Friedman & Byron, 2012) in an industry that, according to one study, has already experienced decades of underinvestment due to the lack of clarity (Panchak, 2012).

Canada's relatively low tax rate, abundance of natural resources and skilled labour makes them well suited to support the growth of advanced manufacturing (Boothe & Dicerni, n.d.). Particularly, the success of Canada's advanced manufacturing sector is based on the presence of world-class infrastructure that is supported through the effective application of information technology and access to the global market (LeClaire, 2009). In spite of these strengths, there are concerns regarding whether these new technologies can help countries such as Canada regain competitive advantage or continue to replace low-skill, monotonous jobs (Sachs et al., 2015). Nonetheless, the embrace of advanced manufacturing appeals to manufacturers who have been affected by the flood of low-cost exports in advanced economies such as Canada (Stanford, 2017).

2.8 Adaptive Reuse

While the closure of large manufacturing firms has resulted in economic hardship for former workers and the tax base of a municipality (Doucet, 2017; Hackworth, 2016), the abandonment of the physical structures they once operated in has created both problems and opportunities for planners and developers alike. Adaptive reuse is generally defined as a major change in a building's use, other than what it was originally intended for (Smith et al., 2015). However, other definitions are based on the general obsolescence of the site, stating that the process of adaptive reuse changes what has become a disused or now ineffective item, into something that can be used for a new, productive purpose (Bullen, 2007; Burchell & Listokin, 1981; Smith et al., 2015). With variations in its definition, the phenomenon of adaptive reuse gained prominence during the 1960s and 1970s in response to mounting concern for environmental sustainability and preservation (Vrusho, 2015), since becoming viable option for redevelopment (Conejos, Langston, Chan, & Chew, 2016). As new construction in developed countries increases, there have been growing demands to improve existing building stock and to even cease the construction of new buildings in industrial areas to combat high vacancies (Bullen, 2007). As economies continue to transition away from labour and space intensive manufacturing, greater attention has been paid to the prospect of adaptive reuse as a solution to a growing number of industrial vacancies.

To urban planners and developers, vacant industrial buildings often connote a series of liabilities associated with the redevelopment of these sites. As a result, developers often regard demolition as the only practical solution to revitalization (Bullen & Love, 2011). There is a belief that the transformation of once dilapidated industrial sites into renewed, productive spaces

signifies a substantial improvement in quality of life and land use (Langston, Wong, Hui, & Shen, 2008; Loures & Panagopoulos, 2007). In spite of their condition, older buildings symbolize a vital aesthetic, cultural and economic resource, an appeal that cannot be replicated in new construction (Burchell & Listokin, 1981; Shipley, Utz, & Parsons, 2006).

For proponents of adaptive reuse, there are notable variations amongst industrial properties and their capabilities for reuse, creating uncertainty amongst developers. Generally, industrial buildings that have been vacant for long periods of time tend to be in poorer condition than newly vacant properties, a situation that is exacerbated by an owner's lack of inclination to refurbish the property to attract a new tenant (Ball, 1999). With the deterioration of these properties, demolition is often chosen as the most suitable strategy for these spaces as the building is no longer perceived to have value (Bullen & Love, 2011; Shipley et al., 2006).

In the post-war era, there was a large scale shift from multi-storey factories, located within core areas, to single level factories in the urban periphery to increase efficiency (Doucet, 2017). In particular, there are core differences between these types of industrial buildings and their capability for reuse. Notably, the location of industry often influences the overall footprint of the site. Industrial sites located within the urban core are often multi-level and space efficient (Hackworth, 2018), whereas suburban factories' footprint can be three times larger per worker due to greater availability of land (Doucet, 2017). These multi-level industrial buildings may be well-suited for residential reuse projects, whereas cleaner industrial uses such as warehousing, provide flexibility through open space, that can be used in a variety of reuse projects. This type of building can accommodate sequential development, whereby smaller companies can occupy a portion of the space, thereby increasing its adaptive reuse potential (Sahraiyan & Tümer, 2017; Shipley et al., 2006).

While particular industrial uses may negate or encourage certain reuse projects, there has been considerable debate surrounding which design criteria would provide optimal adaptive reuse potential for existing and future buildings (Bullen & Love, 2011; Conejos, Langston, & Smith, 2011; Eppig & Brachman, 2014; Loures & Panagopoulos, 2007; Sahraiyan & Tümer, 2017). Given the existing knowledge and policy gap surrounding the assessment of existing and new buildings for reuse, methods of quantifying a potential for reuse have been created. This includes the Adaptive Reuse Potential (ARP) Model, which uses a generic scoring system that can be applied to all building types and locations through predicting the building's useful life as a function of discounted physical life and obsolescence (Smith et al., 2015). This scoring system has helped assign value to the wide-ranging building qualities and ages seen in industrial buildings and redirects the focus to the practicality of their adaptive reuse potential (Ball, 1999). The ARP Model is based on seven obsolescence categories; physical, economic, functional, technological, social, legal and political (Langston et al., 2008). Given that most industrial buildings are not designed for adaptive reuse from the outset, there is a lack of a rating system that addresses the adaptive reuse potential of a building in its design stage (Bullen & Love, 2011; Conejos et al., 2011).

The concept of adaptive reuse has generated praise from environmentalists because of its support of key sustainability concepts by lowering material transport, pollution and resource extraction generally required for new construction (Bullen, 2007). The perception of reuse has left decision makers with a positive interpretation of adaptive reuse, who view it as appealing to those who are economically and environmentally conscious, despite little knowledge of what sustainability entails (Ball, 1999). Case studies of the adaptive reuse of industrial buildings have revealed tangible benefits in addition to sustainability. This includes minimizing the use of

existing materials and limiting sprawl (Bullen & Love, 2011), as well as many social and economic advantages. Adaptive reuse can generate social benefits such as improving cultural values and reducing crime, while also providing benefits to both developers and municipalities through reduced tax rates and use of existing infrastructure (Bullen, 2007; Burchell & Listokin, 1981; Sahraiyan & Tümer, 2017). In contrast, there are also criticisms that adaptive reuse transforms spaces once dominated by low-skill workers into places where affluent people congregate in gentrified neighbourhoods that are largely exclusive areas of elite consumption (Florida, 2017; Heying, 2010; Zukin, 1987).

The potential for an industrial site as a viable adaptive reuse project is hindered by the short-sighted tendencies of the site's predecessor. A common practice amongst corporations, particularly multi-national corporations, is to encourage the "milking" of the plant and its assets. The colloquial term milking is informally used to describe the process whereby corporations make strategic decisions to limit investment in many of their branches, allowing for their deterioration (Ball, 1999; Drache, 1989). This includes the reallocation of capital while simultaneously failing to fix or replace obsolete equipment, in an effort to generate as much profit as possible (Bluestone & Harrison, 1982). These plants, despite remaining profitable, consequently become inefficient and lag in productivity compared to more recently constructed, modern plants located south of the border and are then closed (High & Lewis, 2007). As a result, physical structures become run-down and in need of considerable renovations. These buildings often then attract return-oriented investors, who will purchase the building at a very low cost, and allow for further depreciation (Hackworth, 2018). The perception of these sites has a key influence on how local economies develop (Ball, 1999). This cycle often culminates in the demolition of these sites.

This process has resulted in a negative perception of industrial sites, whereby the only way for investors to make a reasonable profit is to demolish these sites and build new (Ball, 2002). Due to significant variations in industrial site condition, there is considerable debate amongst developers if reuse is financially viable. The use of existing structures is seen by some as a viable way to reclaim existing materials, effectively driving down construction costs (Bullen & Love, 2011; Sahraiyan & Tümer, 2017; Smith et al., 2015). In spite of this, one study found that adaptive reuse project in Kitchener can cost two times as much as a new build (Shipley et al., 2006), whereas other studies found that adaptive reuse is more cost efficient than a new build of a comparable structure (Ball, 1999). In particular, one study found that 83% of owners of industrial sites perceived that adaptive reuse was more economically viable than demolition (Bullen, 2007). This general uncertainty has served as a deterrent to reuse; perpetuating a perception that lower quality construction will present multiple future issues surrounding maintenance costs as well as health and safety concerns (Bullen & Love, 2011). Further, older sites or those in poorer condition are less suited for modern production techniques, and are therefore less likely to find an industrial tenant, with the solution being the creation positive of partnerships between local and private developers through adaptive reuse policy (Ball, 2002).

While there are broad advantages to adaptive reuse, studies have found that the location of a vacant building remains to be the most influential factor of value (Eppig & Brachman, 2014; Tan, Shuai, & Wang, 2018; Wilson, 2010). Other studies suggest that that are several factors when weighing a site's candidacy for reuse including design, energy efficiency, condition of existing infrastructure as well echoing the importance of convenience of location (Bullen & Love, 2011; Loures & Panagopoulos, 2007). Industrial adaptive reuse projects place a focus on sites that are easily accessible, adaptable and enhance the surrounding built form (Loures &

Panagopoulos, 2007) as well as the site's overall condition (Ball, 2002). Many sites located outside the urban core are heavily car dependent (Shipley et al., 2006), and were often constructed with a façade that lacked natural forms light, therefore making them less suited for particular projects, namely residential (Tan et al., 2018).

These physical characteristics of an industrial building that can affect its potential for reuse, particularly for commercial or residential use. Multi-storey buildings that once housed light industry, located within the urban core, are often prime candidates for conversions into condominiums, loft studios and offices (Loures & Panagopoulos, 2007; Tan et al., 2018). In contrast, the value of large industrial buildings stems from their ability to serve for different functions (Sahraiyan & Tümer, 2017). The appeal of older buildings is based on the character they possess, compelling developers to preserve all or parts of the structure to conserve particular aspects of history or design (Langston et al., 2008). Nonetheless, the appeal of industrial buildings is often not enough to spare buildings located on the urban periphery or small towns from demolition (High & Lewis, 2007). An increasing awareness of the scarcity of resources and land constraints (Camocini & Nosova, 2017), coupled with new design strategies that emphasize historic, socioeconomic and cultural aspects of the site have advanced the efforts to preserve former industrial sites through adaptive reuse projects (Loures & Panagopoulos, 2007).

2.9 Research Gaps

The literature review of deindustrialization highlighted several key findings relating to globalization, the economy, labour market, advanced manufacturing and adaptive reuse, while also providing opportunities for further research. Existing literature (Bronstein, 2009; Hackworth, 2018; Hersh & Weller, 2003; Marsh, 2012; Sachs et al., 2015) is heavily reliant on

case studies and examples based in the United States, with little information on deindustrialization in the Canadian context and how it has affected individual cities within the Canadian rustbelt region of southern Ontario. Plant closures and industrial abandonment appear to impact Canada and the United States in fundamentally different ways (Hackworth, 2016). Given the varying structural characteristics such as currency differentials, population size and geography between the United States and Canada, adaptive reuse strategies are to be tailored to each jurisdiction.

There are further research opportunities to examine the extent and nature of plant closures in Canada, considering the lack of available data relating to occupancy rates in manufacturing firms and emphasis on plant closures in the United States (Chapple, 2014; Staudohar & Brown, 1987). The related impacts surrounding plant closure including the subsequent use of these industrial sites remains questioned, including the general financial viability of adaptive reuse (Bullen & Love, 2011; Shipley et al., 2006). With the location of former industrial sites prized, there are broad categories which scholars point to as other determining factors in a sites eligibility for reuse (Ball, 1999; High & Lewis, 2007; Loures & Panagopoulos, 2007).

Despite losing most of its manufacturing base, Kitchener, Ontario has seen the largest population increase out of Canadian rustbelt cities. This includes a population increase from 44,000 in 1951 to 204,000 in 2006 (Hackworth, 2016), with Regional population projections estimating of population of nearly 750,000 by 2031 (Region of Waterloo, 2018a). For this reason, exploring the impacts on cities within the Canadian rustbelt such as Kitchener, Ontario are necessary. To date, the adaptive reuse of spaces in the urban core of Kitchener has been researched in some detail (Shipley et al., 2006; Sugden, 2017). With location being cited as an

important factor in a site's eligibility for reuse (Eppig & Brachman, 2014; Tan et al., 2018; Wilson, 2010), it is worth examining the influence of location on the prospect of adaptive reuse in the urban periphery of Kitchener.

These key findings, identified through the literature review and evaluation of existing policies, were used to develop core research questions. What remains to be answered is what characteristics these buildings and or sites possess that have encouraged or inhibited their reuse, and, if location remains to be the most influential in a site's candidacy for reuse. In addition, are there other factors that are considered when contemplating adaptive reuse such as sustainability, lower construction costs and/or contribution to the revitalization of surrounding areas? More broadly, what factors have encouraged and inhibited the adaptive reuse of industrial buildings in Kitchener's central, core and suburban neighbourhoods? The methods used to explore these research questions are discussed in the subsequent chapter: *Chapter 3: Methodology*.

Chapter 3: Methodology

The following is a summary of the research methods that were undertaken, in addition to the scope of research, methods of both primary and secondary data collection and the case studies selected as part of this study. This purpose of this chapter is to discuss the mixed methods approach to research that was utilized to address the research questions identified in previous chapters. The methods of data collection were intended to be multifaceted in an effort to fully address the complex and diverse factors involved in adaptive reuse projects.

3.1 Research Approach

Traditionally, the approaches to research have been viewed through a binary lens, emphasizing an approach with either a quantitative or qualitative focus. When combined, a third paradigm known as mixed methods is generated, integrating both qualitative; which emphasizes categorical, as well as focusing on non-numerical forms of data, and quantitative data; which focuses on numerical data (Johnson, Onwuegbuzie, & Turner, 2007). Through employing both approaches simultaneously, mixed methods research produces a more balanced outcome than either method would produce individually (Malina, Nørreklit, & Selto, 2011). By definition, mixed methods is defined as a class of research whereby the researcher combines qualitative and quantitative research techniques, methods, approaches and concepts into a single study (Johnson & Onwuegbuzie, 2004). Moreover, mixed methods integrates the unique designs of each approach, combining both philosophicafl assumptions and theoretical frameworks (Creswell, 2014).

While both quantitative and qualitative researchers use empirical observations (Johnson & Onwuegbuzie, 2004), there are some distinguishing characteristics that easily differentiate either approach. Quantitative research is effective at confirming or refuting existing theories about how and why certain phenomena occur, while also allowing for generalizability (Johnson & Onwuegbuzie, 2004). Additionally, quantitative research is often predetermined and contains instrument-based questions that are often answered through statistical analysis (Creswell, 2014). Adopting a deductive approach, quantitative research emphasizes the use of numerical data to understand the nature of a relationship between two variables (Seasons, 2018b). Nonetheless, quantitative research is not without weakness, often embracing theories that may not necessarily reflect local understanding and is at risk of confirmation bias (Johnson et al., 2007). Not only does the measurement process imply precision, but reliance on instrument-based questions makes it difficult to bridge the common gap between research and reality (Seasons, 2018b).

In contrast, qualitative research takes an inductive approach, emphasizing qualities that cannot easily be measured, rather than numerical data seen in its counterpart (Seasons, 2018b). The main differentiator between the two is that qualitative research often answers questions surrounding “how” and “why”, whereas quantitative research aims to answer “how often” and “how many” (Malina et al., 2011). Qualitative research is useful for studying a small sample of cases in depth, whereas quantitative research is more effective at studying a large sample size in less depth. Likewise, qualitative research is more responsive to local situations and the needs of stakeholders involved, while effectively describing a complex phenomenon (Johnson & Onwuegbuzie, 2004). The intent is to understand a particular social situation or interaction through additional inquiry whereby the researcher is the primary tool in data collection. Qualitative research is often based on assumptions, focusing on the process and outcome

(Creswell, 2014). Due to these qualities, qualitative research often serves as a complement to quantitative research, helping to contextualize and provide insight (Seasons, 2018b).

Qualitative and quantitative approaches have their unique set of strengths amassing a loyal group of researchers who undoubtedly hold preference to one approach. The debate surrounding the superiority of either approach has been divisive amongst researchers, leading to the notion by some researchers that the two paradigms should not be mixed (Johnson & Onwuegbuzie, 2004). When combined in the form of mixed methods research, their unique strengths often counteract their respective weaknesses (Malina et al., 2011). Consequently, there are many reasons why a researcher would choose mixed methods, including the ability to explain quantitative results with qualitative data (Creswell, 2014). For these reasons, my research adopted a mixed methods approach, aiming to provide a better understanding of the quantitative data I gathered surrounding deindustrialization and adaptive reuse such as broader labour market trends.

Existing quantitative data has established that in advanced economies, particularly in nations such as the United States and Canada, there has been a steady decline in manufacturing throughout the last several decades (Alderson & Nielsen, 2002; Bronstein, 2009; High, 2013; Rowthorn & Ramaswamy, 1997). Further, it is established that these nations have reacted to plant abandonment in fundamentally different ways (Hackworth, 2016). In adopting a mixed methods approach to my research, the objective was to gain a more detailed understanding of the quantitative data by using qualitative methods to understand the impacts deindustrialization is having on the physical use of these spaces in a local context. Individually, quantitative or qualitative research approaches are not sufficient to explain the many agents that are involved in

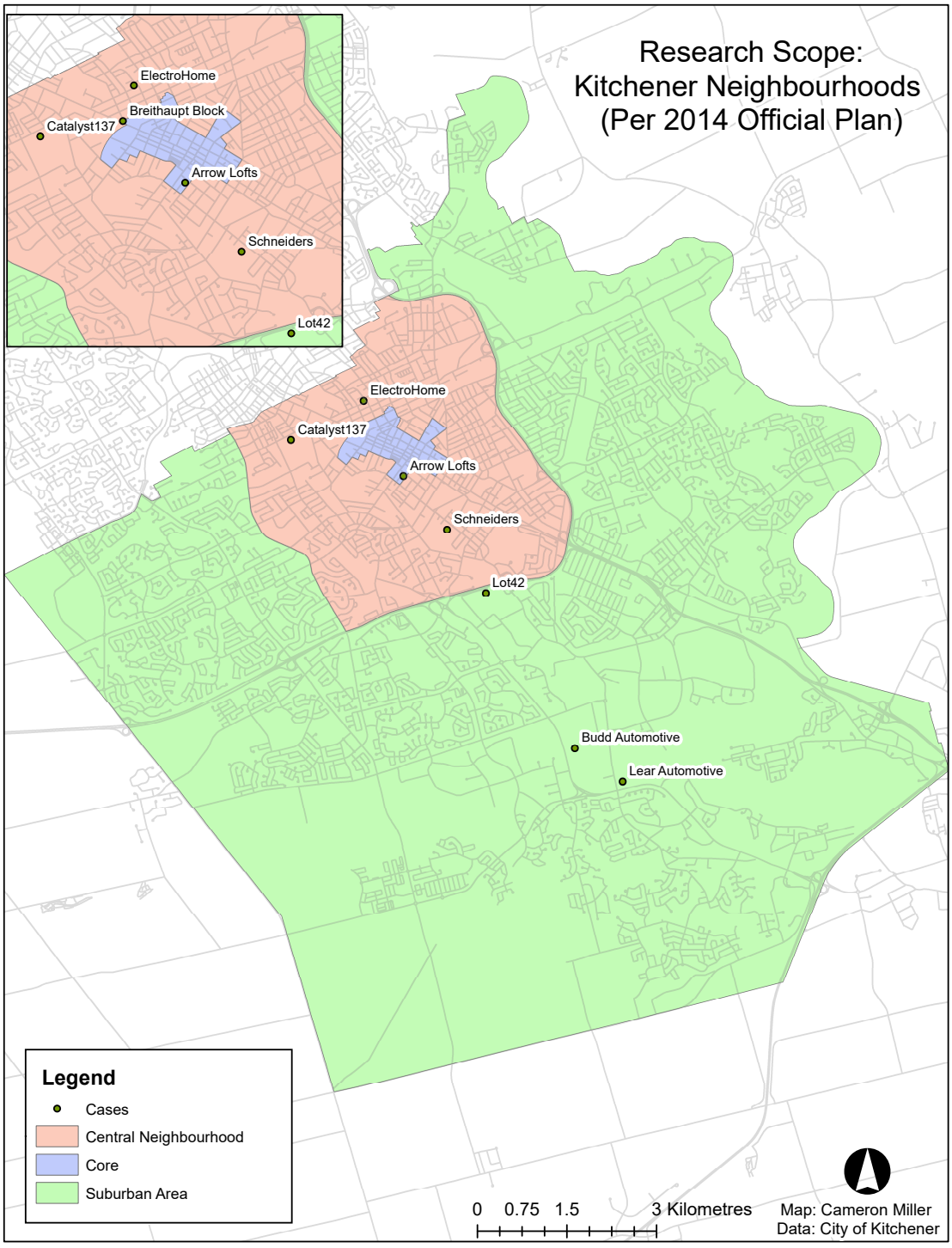
the process of deindustrialization and subsequent reuse; therefore, a mixed methods approach allows for a combination of the two approaches.

In the case of my research, a mixed method approach permitted a more complete understanding of the impacts of deindustrialization in Kitchener. Specifically, mixed methods allowed for the integration of quantitative forms of data, such as how many plants have shuttered in Kitchener in a specific amount of time and the exact number of jobs lost, but through relying on qualitative data, I was able to probe further in how these plants have found or struggled to find new life. More specifically, qualitative data analysis allows for the examination of a variety of case studies that examine the unique adaptive reuse of these former industrial spaces.

3.2 Scope

The scope of this research was intentionally limited to the jurisdiction of Kitchener, Ontario, Canada. The study area was subdivided into three neighbourhoods as per Schedule C1 and C2 of the City of Kitchener's Official Plan (2014) which served as the geographic reference for each case study (see Figure 3-1 below). These areas were utilized as an agent for selecting a sample of where industry locates within Kitchener, while also further examining the role of location in adaptive reuse projects. A full profile of the City of Kitchener, including the economic history, is discussed in *Chapter 4: Case Study Background: The City of Kitchener.*

Figure 3-1: Case Study Area



Map by Cameron Miller with data from the City of Kitchener

3.3 Research Methods

To reflect the complexity of the issue of deindustrialization and adaptive reuse, a variety of research methods were employed. My research method followed an explanatory sequential mixed methods design. In explanatory sequential mixed methods, the researcher collects quantitative data in the first phase and then through analyzing the results is able to inform the direction for the second qualitative phase (Creswell, 2014). The results that are gathered in the first quantitative stage are often used as a justification for the types of participants that will be selected for the qualitative phase and the range of questions that will be asked. Overall, the intent of this approach is for the qualitative data to aid in further explaining the initial results produced by the quantitative stage of research (Ibid). In the case of my research, quantitative data examined local manifestations of deindustrialization in Kitchener, which were further examined through case studies of former large manufacturing firms, including interviews with developers, property owners and local planners.

3.4 Triangulation

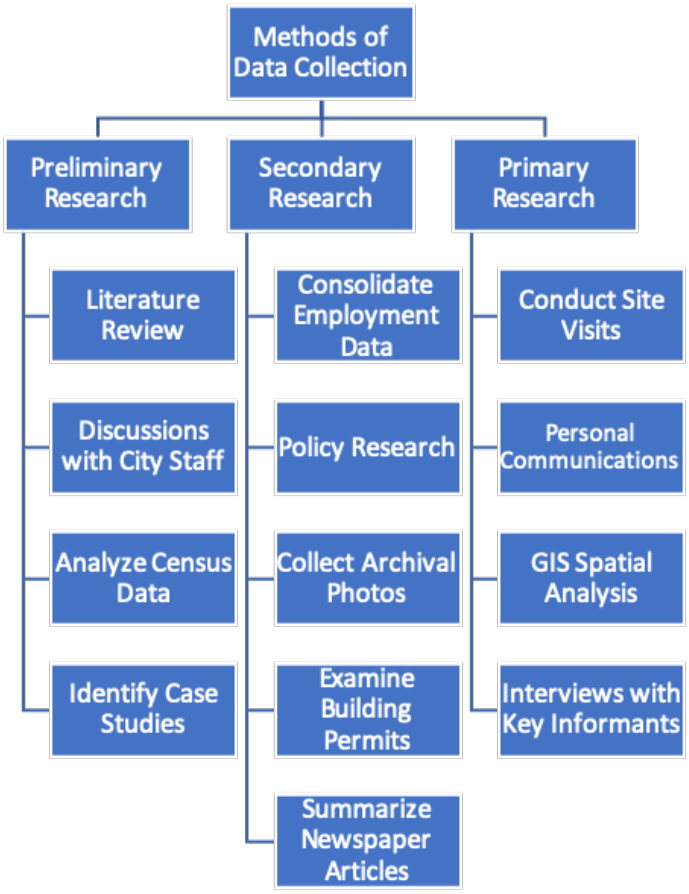
My research methods involved multiple forms of evidence to ensure validity, integrated through triangulation. Triangulation involves the collection of data from a variety of sources, including interviews, case studies and quantitative forms of data (Creswell, 2014). In the case of my research, triangulation involved the integration of quantitative descriptive statistics and case studies surrounding deindustrialization, aided by the use of interviews to ensure an all-inclusive approach to research. Triangulation can be described as the convergence of quantitative and qualitative findings to test the validity of a researcher's findings (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). Multiple methods were deployed, converging to address a

variety of to answer remaining gaps in the literature surrounding deindustrialization and adaptive reuse.

3.5 Data Collection

To reflect the complexity surrounding industrial closure and adaptive reuse, data was collected from a variety of different sources, both in qualitative and quantitative form, and synthesized to address the greater scope of the research question.

Figure 3-2: Methods of Data Collection



Source: Cameron Miller

3.6 Preliminary and Secondary Data

There was a broad spectrum of secondary data that were used to further explore the ideas gathered by the completed literature review and consultation with public sector staff. Research was initiated by framing deindustrialization in the local context of Kitchener, Ontario using quantitative data. More specifically, research was initiated with the use of a quantitative descriptive research design to describe the current prominence of deindustrialization in Kitchener, with an emphasis on change in the last decade and a half. To better understand the larger shift in the labour market that is responsible for the closure of many industrial sites, data was collected from the largest employers by number of people employed in Kitchener in the years 2004, 2009 and 2016. Initial periods of 2004 and 2009 were based on information published in various policy documents such the City of Kitchener's Comprehensive Review of Employment Lands (2010). Many of the employers listed on Kitchener's most up-to-date list of top employers such as Schneiders Foods Inc. had since closed. To accurately reflect the current situation of the labour market, a data request was made to the Region of Waterloo's Planning Department. Complemented by information provided by the City of Kitchener, these data were then categorized based on industrial versus non-industrial uses and supplemented with the number of people employed and if the employer has since downsized or ceased their operations.

Case studies were created to explore the history of the industrial site and the role it once played in Kitchener's economy in the community. Multiple sources of information were collected and synthesized, including news articles, archival imagery, building permit records, employment data and a review of related adaptive reuse policies. This process began with a digital search of all published newspaper articles on selected case studies, by site name.

Approximately 120 newspaper articles, both online and in-print, were summarized to extract information relating to the plant's operations, history, closure and community sentiment surrounding the site. Guided by many of the articles that showcased historical photos of the sites, a formal request was made to the University of Waterloo's Special Collections to acquire archival photos of the industrial sites during their previous industrial use. Emphasis was given to photos that illustrated the site's previous use and other distinguishing characteristics of the structure that may have changed or remained static over several decades.

To complement these data, building permit records were collected from the City of Kitchener's interactive mapping tool. The City of Kitchener stores records for both "Historic" and "Current" building permits, with Historic building permits representing any permits that have since been closed or were cancelled. The database provides the issue year, work description, value of the construction completed and the permit applicant. Through analyzing the work description and type of permit issued, I was able to determine which permits were issued for the main conversion of the site from its previous original intended use to its post-adaptation use. Construction values for permitted deemed to be costs related to the main conversion of the building were combined to calculate a total cost of conversion. In conjunction with other forms of secondary data collection, this information provided a complete detail of the history of the plant location, pre and post-adaptation.

3.7 Primary Data

Following the collection of secondary data via the Special Collections, site visits were conducted in an order to better understand the site's current state, as well as to attempt to replicate the archival photos to understand the level of change each site has undergone. These

photos were used as a comparative tool to analyze minor or major changes in the site's built form, such as additions or renovations. In the case of Schneiders, there was no information published on the timeline of various renovations that the nearly one-hundred-year-old structure has underwent, including the bricking over of windows seen in early photographs of the site. To answer lesser known questions regarding the site's built form, personal communications were utilized with former staff members of these sites, providing personal insight into their renovation history.

Geographic Information Systems ("GIS"), specifically ArcGIS and Google Earth Pro, were used to supplement the existing public information regarding the site's history and physical characteristics. First, each building's footprint was digitized, with the boundary then used to calculate the amount of the building that was preserved, as well as its proximity to transit stations. The measurement of a site's proximity to transit was derived from the City of Kitchener's classification of a 10-minute walking distance (800 metres). This measurement addressed the literature surrounding the role location plays in a site's eligibility for reuse, assigning a reasonable travel time for transportation methods other than a car. An 800-metre radius was placed around each site, which captured all Grand River Transit (bus) and Light Rail Transit stops within the defined radius. The final qualitative, and all-encompassing piece of primary research was the use of semi-structured interviews. The use of semi-structured interviews is discussed in greater detail in Section 3.11.

3.8 Confirming Research Gaps

To formulate research questions that would yield results for those in various sectors, consultation was undertaken with a public sector staff in the spheres of planning and economic

development. Initial discussions were held the Director of Economic Development with the City of Kitchener and the Brownfield Incentive Coordinator with the Region of Waterloo. These discussions were used to reveal areas of research that have not been addressed by the City or by the Region. Through these discussions, further research was directed to addressing adaptive reuse and redevelopment of site's located outside of Kitchener's downtown, while also re-evaluating the role of financial incentives in encouraging adaptive reuse.

3.9 Strengths of Case Study Research

Case studies are often utilized in research as an effective way of providing insight into an event or activity (Creswell, 2014), having both strengths and weaknesses attributed to their use. Case studies are known for their flexibility, due to the fact that they can be conducted at various points throughout a study. Moreover, they are able to capture a phenomenon in a real-world setting, retaining vital information while avoiding unnecessary noise (Murphy, 2014). The case studies that are conducted are often within the context of where the phenomenon is prevalent and is therefore characteristic of its natural environment. This approach allows for the application of both qualitative and quantitative analyses of the collected data which helps to both explain and explore the phenomenon in question (Zainal, 2007). Nonetheless, there are also several disadvantages associated with this method, including a challenge of generalizability. More precisely, results produced through case studies are difficult to generalize due to a small sample size and specific thresholds that may not be applied elsewhere (Murphy, 2014). In the case of my research surrounding deindustrialization, my findings are limited to a local context and therefore are difficult to generalize in a global context.

3.10 Case Study Selection

To further examine the process of deindustrialization in Kitchener, including the scores of large plants that have closed in recent decades, case studies were utilized to further examine the present use of former industrial sites. According to (Yin, 1994), case studies are the preferred strategy when attempting to answer both "how" and "why" questions. More specifically, this approach is the most effective when the focus is on contemporary events with real-life context. In the case of my research, the contemporary issue of deindustrialization and adaptive reuse has significant implications in context of Kitchener's economy and labour market. In addition, case studies are effective at further exploring a process. In the context of my research, that process is deindustrialization, specifically how it has not only resulted in the closure of large plants, but also how these large spaces are being repurposed. In case study research, case selection maintains a crucial role in successful case study research (Elman, Gerring, & Mahoney, 2016).

With the diversity in nature of size of former industrial sites in Kitchener, and many various levels of reuse, eight unique case studies were chosen. Each case study was selected based on a respective theme (see Table 3-1), which encapsulated any common or contrasting characteristics between sites. Location is cited as one of the most determining factors for an industrial sites candidacy for reuse (Eppig & Brachman, 2014), as a result, the site's location was an integral part of the case study selection process. The City of Kitchener's Official Plan (*City of Kitchener Official Plan*, 2014), defines three areas that cover the extent of the city: Core, Central Neighbourhood and Suburban Area. To determine the role that location plays in a site's eligibility for reuse and to assess the role location may play in limiting the type of reuse, if any, each case was contrasted against their locational counterpart.

Table 3-1: Case Study Selection

Theme	***Site Name***	***Location (City of Kitchener Official Plan)***
Reuse of large open space	Catalyst137	*Central Neighbourhood*
	Lot42	*Suburban Area*
Site Redevelopment	Schneiders	*Central Neighbourhood*
	Budd Automotive	*Suburban Area*
New Internal Use	Breithaupt Block	*Core*
	Lear Automotive (JWC Cultivation)	*Suburban Area*
Major Site Contamination	Arrow Lofts	*Core*
	Electrohome	*Central Neighbourhood*

The use of themes was used to further examine site characteristics made them more or less suited for adaptive reuse. These themes were derived from literature which states that there are several site factors which influence its perception to prospective buyers and developers. This includes factors such as location (Eppig & Brachman, 2014), built form (Loures & Panagopoulos, 2007) as well as perceived or genuine site contamination (Drache, 1989). This includes themes such as 'Site Redevelopment', whereby each site is in the process of undergoing major redevelopment, with less than half of the site's buildings being adaptively reused. While the redevelopment of these sites involved few aspects of adaptive reuse, what remains unknown is what physical characteristics of these structures are valued by those who purchase these properties. In contrast, some sites were entirely reused (e.g. Catalyst137), while other sites have failed to find a suitable occupant (e.g. Electrohome).

These case studies were used to address the research question in a variety of ways. Scholarly literature has pointed to a high degree of variability in how certain jurisdictions have responded to deindustrialization and plant abandonment within their own boundaries (Hackworth, 2016; Outhit, 2017; Shipley et al., 2006). As a result, these case studies helped to

explore how a selection of plants have been affected by abandonment and which locations were able to overcome persistent vacancy. Case studies were used to investigate the history of the plant and its former use, type of industry, as well as the size and condition of the site, while examining what role this played in the site's rehabilitation or lack thereof. In part, this method helped to answer both aspects of the research question, first by examining industrial land abandonment and the efforts to redevelop these spaces, and to also study the prospect of reuse and how it wavers under particular circumstances.

3.11 Semi-Structured Interviews

Following the application of case studies, a semi-structured interview component was used to supplement my research. The overall intent of the semi-structured interviews was to conform or refute which factors academic literature states as important to a site's eligibility for reuse. This includes location (Eppig & Brachman, 2014; Tan et al., 2018; Wilson, 2010), design and built form (Loures & Panagopoulos, 2007), as well as site condition (RBall, 1999; Bullen & Love, 2011). In addition, this was in an effort to gain personal insight as well as lesser known details regarding how the closure of manufacturing firms and subsequent re-use has created opportunities or lack thereof for developers and property owners.

Interviews, in a basic sense are questions posed to participants, but the questions will be structured in a way that aims to explain what strategies and tools were used by property owners to carry out successful adaptive reuse projects. Interviews are studied in a real-world setting, providing an in depth understanding to research and if conducted effectively, can provide a plethora of information (Seasons, 2018c). Semi-structured interviews are more flexible than their structured counterpart, allowing for adaptability and for respondents to elaborate and in greater

detail (McLeod, 2014). Consequently, semi-structured interviews were conducted, both in-person and over telephone.

These interviews sought to fully address the main component of the research question, which is to determine what factors assisted in a successful adaptive re-use project and inversely, what hindered their redevelopment. The questions were identified through areas of contention found in the literature (i.e. most important factors in adaptive reuse projects). This is in addition to discussions with policy makers and public sector staff who have been involved with brownfield and adaptive reuse projects who identified knowledge gaps. To test the flow and timing of the interview guide, mock interviews were held with those interested parties who then provided areas for refinement or expansion. A full list of the questions posed to key informants can be found in the Appendix.

3.11.1 Participant selection

For the purpose of selecting interviewees, Key Informants were considered to be people who were, or presently are actively involved in the site's redevelopment, such as developers, owners and employees (see Table 3-2). This was expanded to include individuals who oversaw the redevelopment of the selected case study in question, which included site owners, developers, other staff members of respective development companies, and City of Kitchener staff who have been involved in the site's development history. This produced participants from diverse employment backgrounds, with varying involvements in local adaptive reuse projects. Further, one key informant was assigned per selected case study to emphasize personal experience with adaptive reuse projects as it relates to specific projects. Key informants were identified through their presence on company websites as well as any news articles of the respective site which referenced or quoted said individuals as playing a large role in the redevelopment plans. In

particular, public sector staff were identified through their presence on public documents that referenced the site, including building permits, zone change applications, public meetings and financial incentive applications. Potential participants were contacted via email or LinkedIn with an approved email script requesting their participation in an interview.

Table 3-2: List of Key Informants

Site	***Role in Development***
Catalyst137	*Planner*
Lot42	*Managing Partner*
Schneiders	*Development Corporation*
Budd Automotive	*Planner*
Breithaupt Block	*Planner*
Lear Automotive (JWC Cultivation)	*President and CEO*
Arrow Lofts	*Economic Development Officer*
Electrohome	*Planner*

3.11.2 Strengths of Semi-Structured Interviews

Like many research methods, along with ethical issues, there are strengths and weaknesses associated with interviews. The success of interviews in research is at the mercy of stakeholder participation, if there is not adequate engagement in the process, the researcher is at risk of not gaining a full understanding of the issue (Seasons, 2018c). Nonetheless, the topic can be explored in greater detail than possible in other methods, through allowing respondents to elaborate and provide their unique insights into the phenomenon (University of Hong Kong, 2015). This process can also be time consuming and expensive to conduct (Seasons, 2018c), with transcribing interviews requiring an immense amount of labour hours to transcribe and interpret what the respondents said (University of Hong Kong, 2015). For this reason, the interviews

involved open-ended questions that were based on findings in the literature review but that encouraged answers that were straightforward.

3.12 Data Storage

Interview data were stored in accordance with data storage practices as prescribed by the Tri-Agency Open Access Policy on Publications. Both paper records and electronic files of the interview responses were held, and in some cases, audio was recorded with distinct verbal permission from the respondent. The data was then uploaded to a private Dropbox with password-protected access. Audio recordings were transcribed using voice-to-text software, followed by a verification of data accuracy. The entirety of the interviews was transcribed, which was then used to identify trends in the data. Following the transcription of audio interview recordings, the audio file was deleted, and the digital text file served as the primary data source.

3.13 Data Analysis

Data trends were identified through identifying themes in the key informant's answers. First, questions were separated from the responses and each answer was assigned a unique letter. Categories were broadly determined based on existing findings in the literature and consistencies in key informant's answers. The transcribed interviews were read in their entirety and each answer was assigned to a relevant theme which was identified through letters "A-E". The majority of questions permitted the discussion of several factors, which were then quantified based on their raw counts. Through these counts, frequencies were used to establish the findings, discussed in *Chapter 5: Findings & Analysis*.

3.14 Limitations

When discussing the methods of research, it is important to recognize limitations of the research that was undertaken. First, there is an acknowledgement that the selection of the case studies may have been inherently biased due to the existing knowledge and background I have gained through growing up in Kitchener. While the cases were selected based on their location and their notoriety, my existing experience and personal connection to some sites (i.e. Schneiders) may have influenced the case study selection process. Further, it is acknowledged that particular cases such as Schneiders and Budd Automotive contained few aspects of adaptive reuse. These sites were selected to contrast against fully preserved industrial sites to gain a better understanding of why developers choose to preserve certain aspects and demolish others. Further research would involve a broader selection of sites and a comparative analysis with a jurisdiction of similar size.

The limitations surrounding the implementation of semi-structured interviews was twofold. First, the nature of semi-structured interviews involved interjections of prompts that may have guided the conversation in a particular direction. Prompts were utilized only to encourage the key informant to elaborate on information they had already provided. Nonetheless, there may have been some influence in the answers provided in these interviews as a result.

Second, with the selection of key informants, first priority was granted towards securing interviews with the single most prominent person in a site's development (e.g. senior level staff in both public and private industries). This reliance on high profile developers and property owners resulted in difficulty securing meetings. In substitute, planners or economic development officers who were heavily involved in the site redevelopment were chosen. This created

additional limitations regarding questions that spoke to the effectiveness of existing municipal policies. When posed to planners working in the public sector, the answers provided may have been inherently biased due to their involvement in either crafting or promoting the success of such policy. While extensive pre-consultation was conducted with those familiar with adaptive reuse, relying on one key informant per site may have produced answers that could have varied based on participant selection. Notwithstanding, consistency was applied when selecting all key informants as part of this study.

3.15 Ethics

Due to the nature of research involving the semi-structured interview of human participants, both in-person and over telephone, ethics clearance was required by the University of Waterloo before beginning and formal contact with potential participants. The preparation for ethics clearance involved completing training through the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans Course of Research Ethics (TCPS 2). Following the completion of this training, the certificate was attached to the formal ethics application submitted to the University of Waterloo's Office of Research Ethics as application number 40177.

3.16 Summary

In summary, the mixed methods approach was selected to allow for a detailed analysis into the diverse concept of adaptive reuse. A multiple-case study approach was adopted in combination with the use of semi-structured interviews. A total of eight case studies were selected, with varying locations and sites in different stages of adaptive reuse. Descriptive statistics and other secondary forms of data such as building permit records, newspaper articles,

labour market trends and archival imagery were used to further support findings generated through primary data collection. The following chapter: *Chapter 4: Case Study Background,* details the selected area of study, including its economic history and policy efforts to address the related effects of deindustrialization.

Chapter 4: Case Study Background: The City of Kitchener

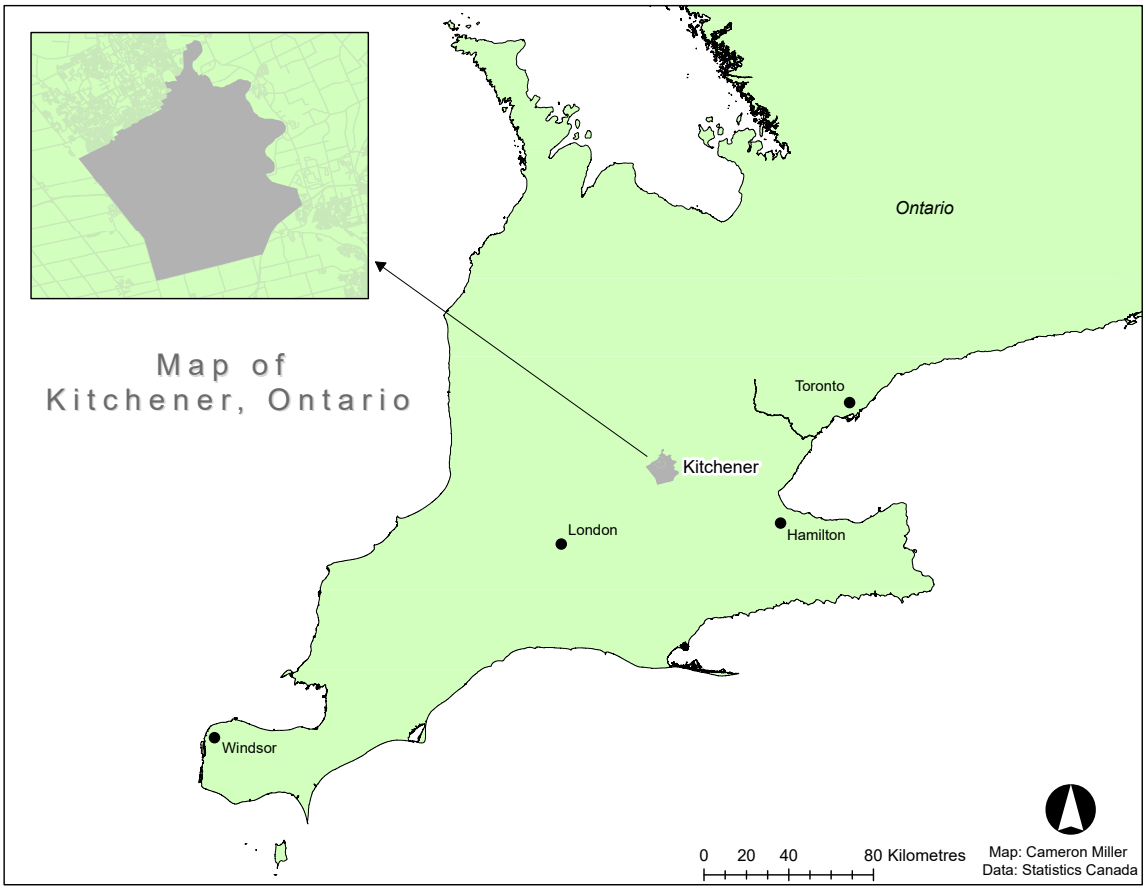
The following chapter is a background on the selected case study of Kitchener, Ontario. The chapter begins by detailing the city's history and examines how labour market trends have influenced policy efforts surrounding the impacts of deindustrialization. Further, the purpose of this chapter is to provide an overview of Kitchener's economic development strategies, official plans and adaptive reuse and brownfield remediation policies and how they have addressed industrial vacancies brought on by deindustrialization.

4.1 Background

The city of Kitchener, Ontario (see Figure 4-1), formerly known as Berlin until the early 20th century, serves as a good example of a once-mighty industrial powerhouse that has since shed most of its industrial roots. In the 19th and 20th centuries, Kitchener was home to traditional industries ranging from various rubber, clothing, automotive and food manufacturers. The settlement of these industries was in part due to the tax breaks provided to new industrial enterprises through Kitchener's 'Factory Policy' (Pender, 2015). The accompanying prosperity brought on by such industry allowed for international brands such as Uniroyal Tire, Lear Automotive, Budd Automotive (Kitchener Frame) and Electrohome to base their long-term investment on Kitchener's labour market and well-established industrial supply chains. With nearly 40% of their workforce employed in manufacturing in 1971 (Filion et al., 2015), Kitchener embraced their reliance on manufacturing, reflected in their previous motto "*Ex industria prosperitas*" (Wallace, 1984), which translates to *"Prosperity through Industry."* However, with the onset of deindustrialization in industrialized markets across North America

and Europe beginning in the 1980's (Bluestone & Harrison, 1982), Kitchener's economy saw an exodus of once major industrial employers in the city.

Figure 4-1: Map of Kitchener, Ontario.



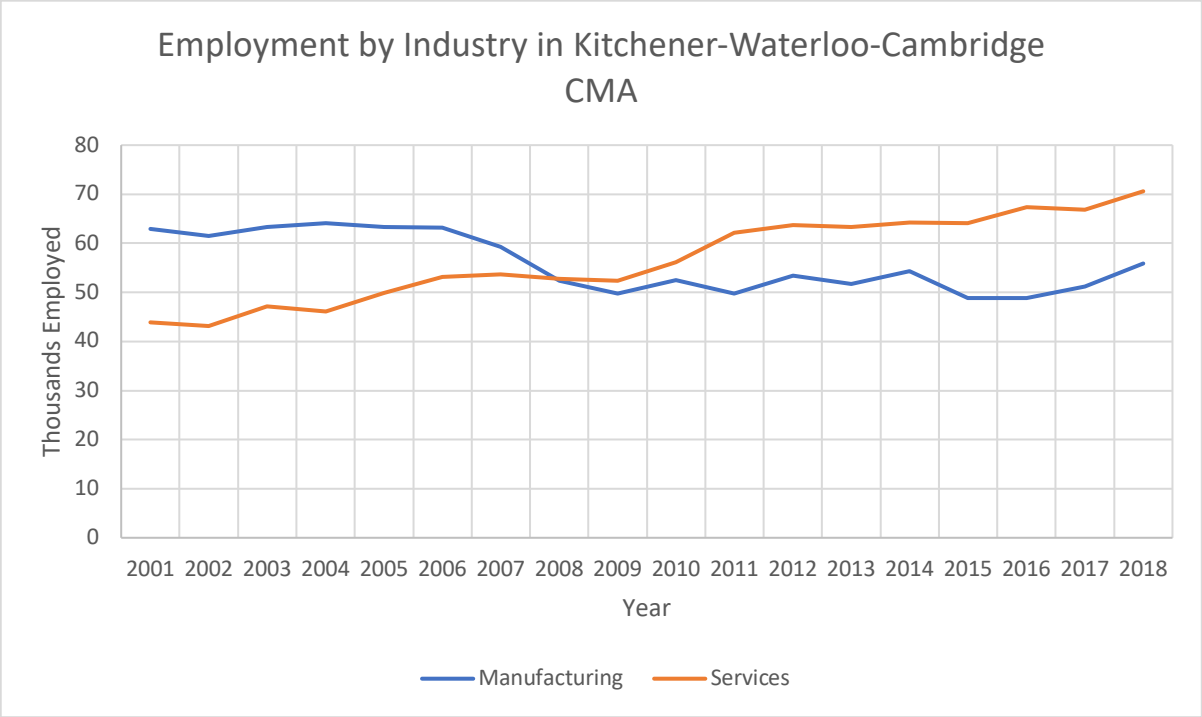
Map by Cameron Miller with data from Statistics Canada

As part of a two-tier governance system, the City of Kitchener, together with the City of Cambridge, Waterloo and the Townships of North Dumfries, Wellesley, Wilmot and Woolwich, form the Regional Municipality of Waterloo. The Region of Waterloo ("Region") has garnered international attention from scholars, policy makers and press for economic resilience and presence of major academic institutions. In spite of losing much of its legacy industries since the early 2000's, the Region has retained a significant industrial base while successfully

transitioning much of its labour force into a reputable hub for Information Communication Technologies (Vinodrai et al., 2012). This has helped facilitate the growth of international companies such as BlackBerry and Kik, while also attracting technology leaders such as Google to locate and invest. Simultaneously, the Region and Kitchener in particular have continued to see significant population growth, outpacing all Canadian rustbelt cities (Hackworth, 2016) and a projection for the Region to reach 729,000 people by 2031 (Region of Waterloo, 2018a).

It is important to acknowledge that the transition from industry to technology has not been seamless and has resulted in economic hardships for a city accustomed to industry. As shown in *Figure 4-2* below, manufacturing in the Region has steadily declined, with employment in the lower-paying service industry replacing many of these jobs (Statistics Canada, 2018). It was found that through 2005-2015, Kitchener was among five cities that saw the least income growth (Outhit, 2017). During this period, Kitchener experienced the closure of many large manufacturing employers such as Uniroyal Tire, MTD, Lear Automotive, Budd Automotive and Schneiders. With the loss of industries, wages have largely stagnated, seeing median household income struggling to keep pace with inflation in 2015, rising only 1.4% (Outhit, 2017).

Figure 4-2: Employment in Kitchener-Waterloo Cambridge CMA



Source: Statistics Canada (2018), Table 14-10-0097-01 with Author's Calculations

4.2 Kitchener's Labour Market Shift

As evidenced in Table 4-1, Kitchener's economy in the early 2000's was dominated by a few large industrial employers. Out of the ten top employers in 2004, eight were industrial in nature. This employment base was led by automotive parts producers such as Budd Automotive Inc., Lear Canada and Uniroyal Tire Manufacturing, which accounted for nearly 4,000 jobs. Food manufacturing was another notable employer led by two Kitchener companies, both founded in the 19th century. The first was Schneider Foods Inc., which produced a variety of deli-meats and sausages, and cookie and cracker producer Dare Foods. To complement these were other manufacturers of consumer goods such as MTD Products Limited and Waterloo Furniture Components Limited. Together, these industrial employers accounted for

approximately 8,000 jobs in a city with a population of less than 200,000 according to the 2006 Census.

Table 4-1: Top Employers in Kitchener (2004)

	2004 Top Employers in Kitchener	*Employees (2004)*	*Status*
1	**Budd Automotive Inc.**	**1,800**	**Closed (2008)**
2	**Schneider Foods Inc.**	**1,515**	**Closed (2015)**
3	Manulife Financial	1,400	Open (Non-industrial)
4	**Uniroyal Tire Manufacturing**	**1,087**	**Closed (2006)**
5	**Kuntz Electroplating Inc.**	**900**	**Open**
6	**MTD Products Limited**	**830**	**Closed (2008)**
7	**Waterloo Furniture Components Limited**	**750**	**Closed (2013)**
8	**Lear Canada**	**700**	**Closed (2015)**
9	**Dare Foods Limited**	**625**	**Open**
10	Rogers Communications	550	Open (Non-industrial)

Source: City of Kitchener Comprehensive Review of Employment Lands (2010) with Author's Calculations

In the years surrounding the 2008 recession, Kitchener lost significant industrial employers such as Uniroyal Tire Manufacturing, MTD Products Limited and Budd Automotive Inc. In five years, all industrial employers present on the previous list saw considerable reductions in their employment base and were subsequently replaced by employers that were smaller in size, and largely non-industrial in nature (see Table 4-2). Many of these employers that had vanished from the previous list had existed in Kitchener for over fifty years, kickstarting a seemingly inevitable transition to an economy that had been based in industry since its inception.

Table 4-2: Top Employers in Kitchener (2009)

	2009 Top Employers in Kitchener	*Employees (2009)*	*Status*
1	**Schneider Foods Inc.**	**1,688**	**Closed (2015)**
2	Manulife Financial	1,200	Open (Non-industrial)
3	Arvato Services Inc.	954	Open (Non-industrial)
4	Conestoga College	720	Open (Non-industrial)
5	Rogers Communications	720	Open (Non-industrial)
6	**Kuntz Electroplating Inc.**	**600**	**Open**
7	**Dare Foods Limited**	**590**	**Open**
8	**Krug Inc.**	**550**	**Open**
9	**BLM Transportation Group**	**500**	**Open**
10	**Crawford And Company (Canada) Inc.**	**450**	**Open**

Source: City of Kitchener Comprehensive Review of Employment Lands (2010) with Author's Calculations

Less than twelve years later and the economic makeup of Kitchener's economy appears markedly different. The most apparent changes to Kitchener's employment come in the reduction in the number of large employers and the radical shift in the types of companies that are "Top Employers". According to the 2016 census, there are 50% fewer companies that employ over 1,000 people and significantly fewer industrial employers than in 2004. Of the eight top industrial employers in 2004, six have since closed. The two remaining industrial employers from the original list, Dare Foods Limited and Kuntz Electroplating Inc., have experienced reductions in the number of employees and are no longer on the list. Table 4-3 illustrates this transition from industry to service, with non-industrial employers dominating the 2016 list of top employers. The precarity of Kitchener's labour market during 2004-2016 is poignantly illustrated through the challenges of companies to remain a member of these lists. Through 2004-2016, only two employers: Manulife Financial and Rogers Communications, have weathered apparent economic uncertainty and have remained on the Top Employer list.

Table 4-3: Top Employers in Kitchener (2016)

	2016 Top Employers in Kitchener	*Employees (2016)*	*Status*
1	Manulife Financial	1000-2,499	**Consolidating (2018)**
2	Grandlinq Contractors	1000-2,499	**Temporary**
3	Rogers Communications	750-999	Open (Non-industrial)
4	Economical Insurance Group	500-749	Open (Non-industrial)
5	**Christie Digital Systems Canada Inc.**	**500-749**	**Open (Recent Layoffs)**
6	D2L (Desire 2 Learn)	500-749	Open (Non-industrial)
7	**Mitchell Plastics**	**500-749**	**Open (Expanding)**
8	Allianz Global Assistance	500-749	**Relocated**
9	Tone-Gar Security Service Inc.	500-749	Open (Non-industrial)
10	Paramed Home Health Care	200-499	Open (Non-industrial)

Source: Region of Waterloo, 2018b, with Author's Calculations

Several companies, many of which are not present on these aforementioned lists, were unable to survive this radical labour market shift and their end marked a new beginning for their physical remnants. Several sites scattered across Kitchener have closed altogether or relocated amid economic uncertainty surrounding manufacturing in advanced economies. There are notable closures that have occurred in the last two decades (i.e. Budd Automotive, Lear Automotive, Schneiders); however, there are also smaller, less conspicuous closures that have occurred and have gone largely unnoticed due to their physical size or small employment base. It is many of these lesser known sites, however, that are leading the way in revitalization (e.g. Lot42, Catalyst137).

4.3 Make it *[not in]* Kitchener

Kitchener's shift away from industry can be found in examining their three most recent economic development strategies. This begins with the 2007-2010 Economic Development Strategy titled: *Our Future is Now.* This three-year economic development strategy frequently characterized Kitchener as transitioning away from industry in the wake of a rising Canadian

dollar and increasing foreign competition, rendering them uncompetitive. In spite of this, the plan made considerable attempts to retain and attract manufacturing, represented in two of their six key areas of focus (see Table 4-4). According to the plan, the emphasis of Kitchener's economic development strategy in 2004 shifted from purchasing and servicing industrial land, to encouraging the formation of new economic clusters, particularly in the downtown. This shift was realised through the earmarking of $110-million over a ten-year period to stimulate new developments within the downtown. These funds helped to establish various university satellite campuses within the downtown, as well as many notable loft conversion projects including the Kaufman and Arrow Lofts. While this plan made efforts to retain manufacturing, there are explicit references that point to neighbouring Woolwich and Cambridge as better suited for large-scale industrial expansion (Regier, 2010).

Acknowledging that their shift from industry is not unique to Kitchener and seemingly unstoppable, economic developers attempted to proactively shift its focus from manufacturing to technology. This is represented in the economic development strategy that succeeded *Our Future is Now*, known as the 2011-2015 Kitchener Economic Development Strategy ("KEDS"). The areas of focus targeted in the new plan contained similarities to its predecessor, but there were notable omissions manufacturing related objectives (Regier, 2015). As evidenced in Table 4-4 below, KEDS' policy directives were aimed at establishing Kitchener as a start-up economy and recognizing that Kitchener's legacy industries had become uncompetitive in a global market.

Table 4-4: Core Areas of Focus for Kitchener's 2007 and 2011 Economic Development Strategies.

Area of Focus	***2007-2010 Kitchener Economic Development Strategy***	***2011-2015 Kitchener Economic Development Strategy***
1.	*Diversifying the urban economy*	*Start-up City*
2.	*Supporting manufacturing competitiveness*	*Leading-Edge Cluster Building*
3.	*Creating, attracting, retaining and developing talent*	*Become a Talent Magnet*
4.	*Building a dynamic downtown*	*Dynamic Downtown*
5.	*Putting more contaminated lands back to work*	*Innovation District*
6.	*Growing small business*	*N/A*

Kitchener has replaced its corporate motto that expressly acknowledged and encouraged industry and has become city without a motto altogether (personal communication, March 8, 2019). Kitchener's new identity is represented in their 2015 economic development strategy: *Make it Kitchener*. This slogan was developed in response to radical technological changes

including the rise of technology start-ups and re-urbanization brought on by the planned Light Rail Transit system (Macdonald & Regier, 2015). The Make it Kitchener Strategy was formally enacted when Kitchener's Council approved the strategy on November 16, 2015, incorporating six thematic pillars: *Make it Spark, Start, Grow, Urban, Vibrant* and *Connect*. This strategy has also served as marketing material for the city, advertised through its own website www.MakeItKitchener.ca, which showcases a minute-and-a-half promotional video, advertising Kitchener as hub of activity. The strategy acknowledges Kitchener's past, while marketing itself as a city with an industrial base that is still booming, and simultaneously fostering a bustling tech scene: "Our history is rooted in manufacturing, and we are still a manufacturing city, with over 50,000 people making products in the region. But we have become a more complete and competitive city" ("Make It Kitchener," 2019).

The more complete and competitive city is one that focuses on technology start-ups, makerspaces, incubators and co-working spaces. Through its pillars such as *Make it Spark*, there is an expressed intention to encourage the intersection of art and industry, while other pillars such as *Make it Grow* discuss Kitchener as a city that is reinventing itself (City of Kitchener, 2015). This transition is represented in various industrial monuments placed around the city, acknowledging the role of industry in the city's history (see Figure 4-3, below). *Make it Kitchener* has assisted in incentivizing technology to grow in Kitchener, while seemingly allowing the fate of industry to play-out, according to economic development strategies. Incentive programs such as the Startup Landing Pads program, which assists emerging start-ups with locating more permanent spaces in Downtown Kitchener, is one of many programs that incentivizes largely non-industrial forms of employment in technology ("Financial incentives", 2018).

Figure 4-3:Industrial monument in front of the former Kaufman Rubber Factory; now the Kaufman Lofts (2019).

Source: Cameron Miller

4.4 Adaptive Reuse Policy in Kitchener

Adaptive Reuse policy in Kitchener is complex in nature and is covered by an umbrella of various legislations intended to facilitate redevelopment and reuse. The following is a summary of policy efforts by both the City of Kitchener and the Region of Waterloo to address the issue of persistent industrial vacancies.

Adaptive Reuse Community Improvement Plan (2005-2013)

In the late 1990's and early 2000's, Kitchener was reeling from the loss of legacy industries within its downtown. This included employers such as Kaufman Rubber, Arrow Company and the Tannery. The Downtown was experiencing an exodus of business and the area was becoming increasingly vacant. In response, the City of Kitchener produced a marketing package for many of these buildings and sites in an effort to encourage the adaptive reuse of these sites. This was largely considered to be unsuccessful, with only three of the twelve buildings promoted being successfully adaptatively reused. With growing vacancies, increased the number of potential adaptive reuse candidates within the city centre, city staff estimated there were twenty to forty sites that were potential candidates for adaptive reuse projects. This led Kitchener councillors to direct their planning staff to develop an Adaptive Reuse Community Improvement Plan in December of 2004. This plan was implemented in 2005 and served as the primary guiding document for adaptive reuse policy in Kitchener until it ceased in December of 2013.

Traditionally, encouraging successful adaptive reuse projects in Kitchener has been challenging, with many facing financial obstacles that are difficult for many developers to overcome. Specifically, in the early 2000's, there was not a sufficient market demand for adaptively reused sites that outweighed additional development costs associated with these projects. At the time of the plan's adoption in 2005, adaptive reuse loft projects anticipated a purchase price of between $144,000 and $196,000. Nearly 15-years later, the resale cost of a loft unit in the Arrow Lofts, an adaptive reuse loft project, are listed at $539,000 ("Trovit.ca," 2019). This price increase is the result of several externalities, representing an increase in demand for

adaptive projects and similarly, more incentives for developers to take on projects in surrounding areas.

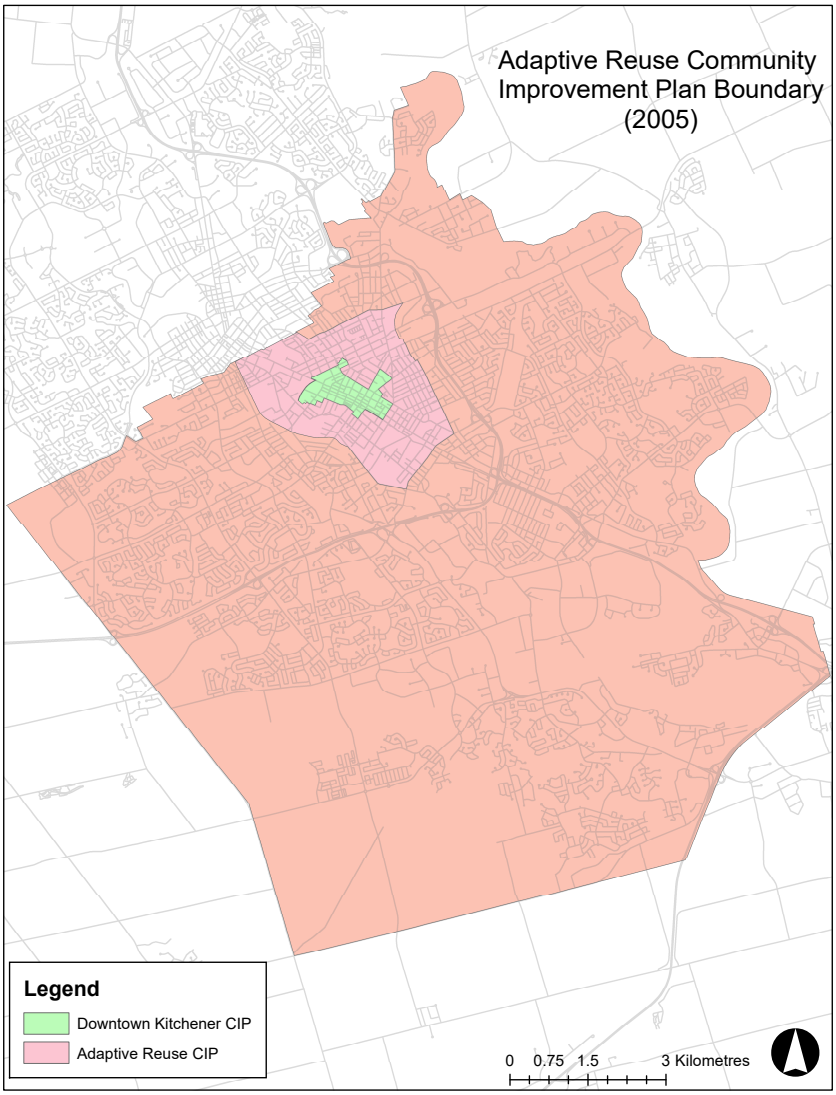
Through an issues paper circulated to various advisory committees, the City of Kitchener identified that adaptive reuse sites provided an ideal opportunity to:

- Preserve industrial heritage;
- Create innovative forms of housing;
- Revitalize derelict properties; and,
- Increase employment and residential opportunities in the City's Central Neighbourhoods

The objective of the Adaptive Reuse Community Improvement Plan was clear and reflected the aforementioned opportunities: "To maintain, improve and rehabilitate Kitchener's current and former industrial, commercial, residential, and public areas". This objective was to be achieved through five strategies, designed in recognition of feedback received in development stages of the plan. The first was to provide financial incentives to property owners and developers to assist with costs associated with repurposing derelict industrial buildings. Second, to provide financial incentives to sites outside of the downtown, but within an 800-metre distance. Third, to jumpstart a marketplace for loft-style housing generated through adaptive reuse projects. Fourth, to ensure that these grants are helping to provide additional community benefits and lastly that these projects are compatible with the surrounding built form.

To be eligible, the site needed to be located within the pre-defined boundary, shown in Figure 4-4, and be a conversion from an industrial to a new, non-industrial use such as residential or office space. If approved, the City of Kitchener provided a grant in the form of an annual rebate on city taxes, through a 'Tax Increment Grant'.

Figure 4-4: Adaptive Reuse Community Improvement Plan Boundary (2005-2013).



Map by Cameron Miller with data from the City of Kitchener

One of the core intentions of the policy was to kick-start a marketplace for adaptive reuse projects such as loft style housing. When the policy was adopted, there was a stipulation that the policy would be reviewed no less than every 5 years to re-examine the necessity for municipal financial assistance in encouraging adaptive reuse projects. The policy was last amended in November of 2010, and it was determined that they were not to provide any incentives for

projects which had building permits issued after December 31, 2013. While the policy remains advertised on their website, the Director of Planning for the City of Kitchener has indicated that the policy is no longer active (personal communication, December 5, 2018).

Brownfield Remediation Community Improvement Plan (2003)

The Brownfield Remediation Community Improvement Plan was originally adopted by council in 2003 with the intention to encourage brownfield remediation and redevelopment through a joint tax increment program. Following the establishment of Regional Brownfields Working Group, a Waterloo Regional Brownfield Program known as "The Regional Brownfield Financial Incentive Program" was created. This comprehensive program replaced municipal programs, such as Kitchener's Brownfield Remediation Community Improvement Plan.

Regional Brownfield Financial Incentive Program (2006)

Presently, there remains to be no municipal policies directly overseeing adaptive reuse projects in Kitchener; however, there are programs concerning brownfield redevelopment crafted by the Region of Waterloo. The Region's Brownfield Financial Incentive Program ("BFIP") has been in effect since 2006, when it began as a pilot project. Since then, over fifty applications have been approved on thirty-six sites, with over $37 million in incentives provided. This assistance is provided in three forms: Phase Two Environmental Assessment Grants, Regional Development Charge exemptions, and joint Tax Increment Grants with the City of Kitchener. This has incentivized developments both in residential and non-residential spaces, turning brownfield sites into productive non-residential floor area and more than 2500 residential units (Ellis, 2018).

Under the current structure, approximately 62.1% of the joint Tax Increment Grant is funded by the Region, with the remaining 37.9% funded by the City of Kitchener. Despite its acknowledged success, the financial viability of the program has come into question (personal communication October 17, 2018). A comprehensive review of the program was recently undertaken, which suggested a number of substantial changes to the program. Through stakeholder discussions, some indicated that they would prefer scoping the program to favour residential developments (Ellis, 2018). In discussions with the current coordinator of the program, there was indications that the necessity for financial assistance was being reviewed, as well as an intention to limit the geographic scope of the program to areas surrounding Central Transit Corridors (personal communication, October 17, 2018). In a March 2019 report to City Council, it was recommended that the Phase Two Environmental Assessment Grants be eliminated as well as current 10% allowance granted for indirect costs associated with remediation be phased out.

Industrial Development Charges

To encourage both new industrial development and redevelopment of brownfield properties, the Region of Waterloo and the City of Kitchener have modified their respective development charges. The Region has implemented a development charge exemption for brownfield sites to assist with costs related with site remediation that would otherwise make the site financially challenging to redevelop. The exemption in development charges is based on the sum of direct costs associated with the site's remediation, in addition to up to 20% for indirect costs. This reduction is applicable to all brownfield properties located within Kitchener, with the exception of the Core area, where all development charges are waived. Without this exemption,

the cost of developing a new fully-serviced industrial building in the City of Kitchener would be $6.09ft^2 (Region of Waterloo, 2019).

The City of Kitchener and the Region of Waterloo have both reduced their development charges for new industrial buildings by 50%. The City of Kitchener reduced their industrial development charges by 50% until March 1, 2019. Without the reduction, the cost of developing a fully serviced industrial building in central neighbourhoods and suburban areas is $1.67ft^2 and $5.54ft^2 respectively (City of Kitchener, 2018). In effect, the cost of developing or expanding to an existing building in central neighbourhoods is significantly less than a similar building in suburban areas. The Region has introduced reduced rates for new industrial buildings or an enlargement of more than 50% of the gross floor area of an existing building. This reduced rate is only effective until July 31, 2019, when By-law 14-046 is set to be reviewed (Region of Waterloo, 2018c), while the City of Kitchener has no plans to extend their rate reductions (personal communication, February 12, 2019).

The present structure of development charges conflict with the goals of adaptive reuse. Characteristic of several development charge structures; a “Development Charge Certificate” is issued to a developer who demolishes an existing building based largely on the principle that these charges have been paid in the construction of the original building (personal communication, February 10, 2019). Therefore, the development charges that a developer may face in demolishing and constructing a building of similar size would be equal to someone who chooses to adaptively reuse a site. In addition, development charges relating to new industrial construction is and was significantly reduced, effectively encouraging new builds.

Official Plan: A Complete & Healthy Kitchener (2014)

Adaptive Reuse projects are actively promoted throughout Kitchener's Official Plan are referenced in several sections:

4.C.1.28 *The City will ensure that new special needs housing or the adaptive reuse of existing buildings for special needs housing is compatible in terms of use and built form with the surrounding context.*

5.C.1.5 *The City will encourage and support the remediation, development, redevelopment and adaptive reuse of contaminated lands, brownfield and greyfield sites in accordance with the policies in Section 6.C.4.*

7.C.6.1 *The City will seek to minimize energy consumption by:*

d) encouraging the adaptive reuse of existing buildings

Economic Development Strategy: Make it Kitchener (2015)

Intensification and revitalization of a city's urban core are common central pillars of economic development policies for municipalities all across Ontario. Kitchener's economy development strategy titled: *Make it Kitchener*, which contains six pillars. Of the six, intensification and revitalization of former industrial buildings within the core aligns closely with the objectives of *Make it Urban* in Kitchener's economic development strategy. More specifically, this particular pillar aims to promote urbanization across the city and to continue the development of a dynamic downtown. According to the strategy, this will be achieved by redeveloping municipal properties in an effort to encourage developers to replicate the same standard set by the City of Kitchener in their developments. Lastly, this pillar aims to encourage

the construction of sought-after urban amenities (City of Kitchener, 2015). The objectives of this plan do not explicitly mention adaptive reuse projects; however, it shares a common interest in redeveloping derelict industrial sites into revitalized community spaces, albeit only within core areas.

4.5 Summary

In summary, adaptive reuse is thoroughly cited in both municipal and regional policy documents. Further, the majority of policies have been reactionary to labour market trends such as deindustrialization and the associated closures of large employers. These policies were reviewed to identify the policy attempts made at addressing related impacts of deindustrialization in an effort to measure the success of these policies in subsequent chapters. The following chapter: *Chapter 5: Findings & Analysis,* provides greater detail into how these data sources, combined with review of policy documents, culminated into a study of the selected cases.

Chapter 5: Findings and Analysis

5.1 Site History

The central research question of this study examines what factors encourage or inhibit the adaptive reuse of former industrial buildings in Kitchener, while specifically examining the role of location. Research generated through the completion of the literature review determined that there are a number of complex factors involved in adaptive reuse projects. This chapter provides a case study analysis of eight (8) Kitchener-based case studies. Each case study belongs to a specific theme which is unique to its pairing and allows for a comparable study of the site's pre- and post-adaptation, beginning with a history of the former site's use and its subsequent change in management and the factors that led to its redevelopment. Characteristics such as any necessary planning applications, changes to the building or site as well as funding will be discussed as precursors to the site's present use to examine its relationship to the aforementioned research questions. A full list of the characteristics discussed are shown below in Table 5-1.

Table 5-1: Key Characteristics

Characteristic	Description	Source
Address	Municipal Address	*Independent*
Location (Official Plan Schedule C1 and C2)	Location of the site according to the City of Kitchener Official Plan (2014)	*City of Kitchener Official Plan*
Date original structure built	The date the site, pre-adaptation, was built	*Building Records and Newspaper Articles*
Size of Property (ac)	Size of property, according to boundary lines	*Google Earth and Newspaper Articles*
Approximate Percentage Reused	Portion of building reused = building reused ÷ total building size pre-adaptation, according to historical imagery	*ArcGIS, Google Earth Pro; Author's Calculations*
Transit	All transit stops within 800-metre radius *(Contains multiple stops on the same route)*	*ArcGIS; Author's Calculations*
Zone (By-law 85-1)	Present zoning classification(s) of site	*City of Kitchener Interactive Mapping Tool*
Former Use	Site's former primary use	*Newspaper Articles*
Current Use	Site's primary use	*Building Records*
Funding Source(s)	Public (taxpayer) versus Private (equity firms, loans, etc.)	*News Articles, Interviews*
Main Conversion Costs	Construction value associated with costs related to the conversion of the main building / site as reported by applicant on building permit applications	*Building Records, Interviews*
Owner / Developer	Owner or developer responsible for the site conversion	*News Articles*

5.2 Reuse of large open space

5.2.1 Catalyst137

Address	137 Glasgow Street
Location (Official Plan Schedule C1 and C2)	Central Neighbourhood
Date original structure built	1966
Size of Property (ac)	24 acres
Approximate Percentage Reused	100%
Transit	54 GRT, 1 LRT
Zone (By-law 85-1)	M-2 (General Industrial)
Former Use	Dominion Tire warehouse
Current Use	Internet of Things Hub
Funding Source(s)	Private
Main Conversion Costs	$13,989,500
Owner / Developer	Miovision

Previously known to workers at Uniroyal Tire as “the warehouse” (personal communication, February 17, 2019), the adaptive reuse of Catalyst137 has transformed the building’s former use as ancillary, to an employment hub. Before Catalyst137, 137 Glasgow Street was originally built in the 1960s as a warehouse for the nearby Uniroyal Tire factory on neighbouring Strange Street. After Uniroyal Tire moved to their now-closed location on Goodrich Drive in Kitchener, the building was used by Kaufman Footwear as general warehousing until it declared bankruptcy in 2000 (B. Jackson, 2016). In the years following, the building was rented out by Kumpfort Zone Warehousing Inc. (see Figure 5-1), until the 475,000 sq. foot warehouse was sold in 2016 to a group of investors.

Figure 5-1: 137 Glasgow Street (2009), Pre-adaptation.

Source: Google Streetview

These investors were Miovision, who in collaboration with Kitchener-based Voisin Capital and Toronto's Osmington Capital allocated $65 million to transform the former warehouse into the largest Internet of Things ("IoT") hub in the world (Wark, 2019). This hub was simply marketed as an "IoT Space for MAKERS" on a 'For Lease' sign posted in February 2017. These investors envisioned giving name recognition to a largely inconspicuous building, paying homage to its street address: 137 Glasgow Street, with the name "Catalyst137". Before Catalyst137, Miovision was located in an industrial park on Manitou Drive, developing platforms for traffic data collection and intersection controls used in fifty countries worldwide. With the growing tech presence in Kitchener-Waterloo, Miovision surveyed their employees and found that many of them wanted to be located within this cluster of similar companies. Miovision was not alone in their quest to relocate within Kitchener's core, as they realized several companies were also seeking out space closer to the core and its amenities but could not locate adequate space to serve their unique needs. Through this demand, these investors were

able to justify their massive investment in capital, which appeared to pay-off; just over one year after purchasing, the site was 75% leased (Pender, 2017b).

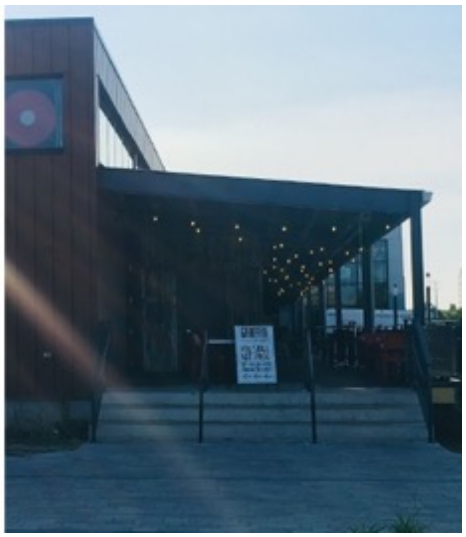
In the short time between when the site was purchased in 2016 and the end of 2018, approximately thirty building permits were issued as part of the building's conversion. These permits represented nearly $14-million in construction costs directly related to main conversion of the site. This included various interior alterations, interior finishes, interior demolitions and numerous interior additions as reported by the permit applicants. These conversion costs included $750,000 in demolition, $700,000 in new site services and $750,000 in exterior alterations to modernize the building's façade (see Figure 5-2). The most significant costs in the site's conversion were attributed to the interior construction of Miovision's office - valued at $4,500,000 - followed by Kik's office at $1,600,000. To-date, the total cost to convert the former warehouse into an IoT hub was $13,989,500 according to building permits issued after the site was acquired in 2016.

Figure 5-2: Catalyst137 (2018), Post-adaptation.

Source: Cameron Miller

Miovision's CEO credits Kitchener's preponderance of technology start-ups for the general success of Catalyst137, stating: "This building conversion was possible because the community itself changed" (Wark, 2018). In particular, it is the tech momentum coupled with its location – minutes from the downtown, which helps companies that exist within Catalyst137 to attract and retain talent. Its location is also well-served by transit, and is in close proximity to the Iron Horse Trail. This has attracted companies such as Toyota, SnapPea Design, SigmaPoint and many others planned and present to Catalyst137. The entirety of the 475,000 sq. foot building has found a new purpose, even transforming old loading docks into a new restaurant to serve both tenants and the public, known as Graffiti Market (see Figure 5-3). To transform the 24-acre property from a warehouse to an employment hub, the owners did not require an amendment to its General Industrial Zone (M-2), rather just 3 years and $65 million in private investments (Wark, 2018).

Figure 5-3:Warehouse loading dock conversion to restaurant.



Source: Instagram user "@Catalyst137kw".

5.2.2 Lot42

Address	41 Ardelt Place
Location (Official Plan Schedule C1 and C2)	Suburban Area
Date original structure built	1955
Size of Property (ac)	17 acres
Approximate Percentage Reused	100%
Transit	38 GRT, 1 LRT
Zone (By-law 85-1)	M-4
Former Use	Ardelt Industries, Double R Steel
Current Use	Lot42- Global Flex Campus
Funding	Private
Main Conversion Costs	$1,306,000
Owner / Developer	Patrick Doyle

Built in 1955, Ardelt Industries began as an isolated steel mill constructed by Rudolf Ardelt. Reflected in its "Heavy Industrial" zoning (M-4), the nature of Ardelt Industries favoured a site that was on the outskirts of the city, away from sensitive land uses and surrounded only by dirt roads and farms (Shown below in Figure 5-4). Over sixty years later, the former Ardelt Industries is located within an industrial park, affectionately named "Ardelt Place" and adjacent to what is now the well-traveled Highway-8. Through its sixty-year history, the 17-acre site was home to a number of industries such as Double R Steel, Aecon and Renishaw Industries (Google Streetview). Its transformation from industry to technology was originally conceived when Ron Doyle purchased the site in 1994 for $2-million. Doyle maintained the building's status quo, and the site has since become a seven-figure income property through renting the space to various tenants (Shaw, 2017).

Figure 5-4: Ardelt Industries (1963)

Source: University of Waterloo Special Collections

It was in 2014 that Ron's son Patrick began managing the property and allowing his education in Sustainable Energy and Building's Technology to help realize his father's vision for the site. Located within an industrial park and not well-served by transit (see Figure 5-5), rezoning the property to non-employment uses would be difficult, if not impossible (*City of Kitchener Official Plan*, 2014). Patrick got to work on bringing his father's 1990 vision into reality, transforming the 17-acre site into what he calls a "Global Flex Campus"; somewhere that could host a variety of arts, technology and community events under one roof, each represented by various colours within their logo (personal communication, April 15, 2019). Initially the site was named Lot41, as a nod to its municipal address, however Patrick soon changed the name to Lot42 to represent a look into what is next for the location (Davis, 2017).

Figure 5-5: Double R Steel (2014), Pre-adaptation.

Source: Google Streetview

With help from a $10-million investment, 41 Ardelt Place quickly became rebranded as Lot42. Through this transformation, Patrick has intentionally preserved the industrial heritage of the site, stating: "We've truly tried to keep that industrial feel…the pure grandness of the main building. We want to have that kind of 'wow' factor" (Davis, 2017). The 40,000ft^2 facility has been host to various community events such as the 2018 Truth North tech festival, Oktoberfest festivals (Hicks, 2018) and multiple country concerts for international stars. Since beginning its transformation in 2016, the site has undergone millions of dollars worth of construction projects. Despite preserving much of the industrial character of the building, $1,306,000 has been spent on transforming 41 Ardelt Place into Lot42. This figure includes $975,000 to construct new washrooms, improve the façade by adding new windows to the exterior and $200,000 to install new HVAC systems and fire systems to allow for assembly occupancy (see Figure 5-6). Lot42 continues to expand its portfolio, playing off its industrial heritage to market themselves to companies looking for a unique venue that can accommodate thousands of guests.

Figure 5-6: Lot42 (2018). Post-adaptation.

Source: Google Streetview

5.3 Site Redevelopment

5.3.1 Schneiders

Address	321 Courtland Avenue Kitchener
Location (Official Plan Schedule C1 and C2)	Central Neighbourhood
Date Original Structure Built	1923
Size of Property (ac)	27.6
Approximate Percentage Reused	37.2%
Transit	69 GRT, 3 LRT
Zone (By-law 85-1)	Present M-2 Zone, to be rezoned
Former Use	Food Processing
Current Use	Multi-use development – residential, commercial, light industrial
Funding Source(s)	Private with public assistance
Main Conversion Costs	Not yet initiated
Owner / Developer	Auburn Developments

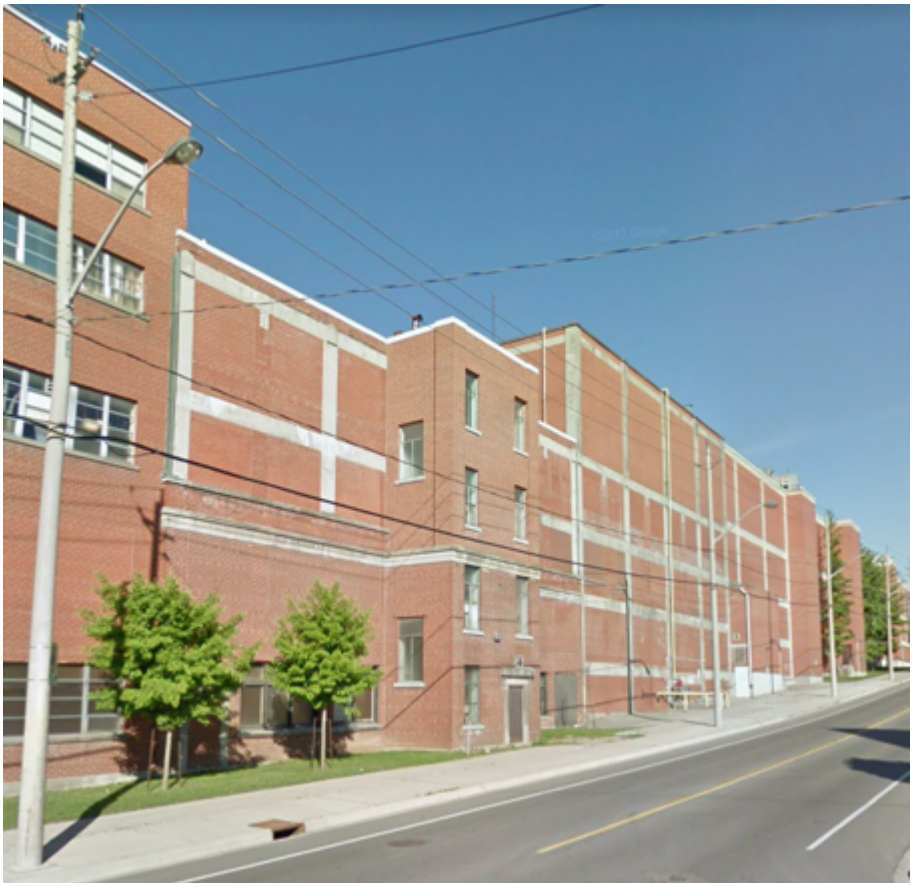
Once a mainstay of Kitchener's economy, Schneiders began in 1890 and operated at its Courtland Avenue factory (see Figure 5-7) beginning in 1923 as a 100,000ft^2 facility which gradually expanded through a series of additions in the 1970's to grow to over 750,000ft^2 (Howitt, 2010a). Originating in the home of John Metz Schneider producing a variety of meats and food products, the company remained family-owned until its sale to Norfolk, Virginia-based Smithfield Foods in 1998, reportedly taking a loss in an effort to keep the operations in Kitchener and refusing to sell to competitor Maple Leaf Foods (Mercer, 2015a).

Figure 5-7: Schneiders' former main entrance (n.d.)

Source: University of Waterloo Special Collections

After purchasing Schneiders in 2004, Maple Leaf Foods ("Maple Leaf") – which was facing shrinking profits aggravated by a high Canadian dollar - embarked on an aggressive plan to modernize their production facilities. After Maple Leaf announced in 2010 that they would be closing and consolidating older production facilities in favour of building new, state-of-the-art ones, Kitchener residents believed their plant and the birthplace of the Schneiders brand was not at risk of closing: "We're one of the biggest plants. I think we'll be alright" - General labourer (2010) (Howitt, 2010a).

Figure 5-8: Schneiders (2009) depicting the modern facade of the plant.



Source: Google Streetview

After telling Kitchener workers in October 2010 that a decision on the fate of their facility was nine to twelve months away (Howitt, 2010b), Maple Leaf announced in October 2011 that the ninety year old facility would be closing, citing that the age and multi-level nature of the building had made operating "prohibitively expensive" (Mercer, 2011). While the closure was a surprise to many, some employees viewed the closure as part of a larger trend in Kitchener: "For Kitchener it's a big blow because there aren't many factory jobs around anymore, […] it's all high-tech now" – Schneiders employee of 33 years (Davis, 2011).

The shuttering of Schneiders joined other closures of legacy employers that closed in recent years such as B.F Goodrich, Budd Automotive and Lear Automotive. Kitchener

desperately tried to convince Maple Leaf to establish their new production facility in town, sending economic development and political officials to Maple Leaf Headquarters who reportedly offered to accommodate the 50 acres of land that the food manufacturer was seeking (R Simone, 2011). Instead, Maple Leaf opted to build their $395 million facility in nearby Hamilton, Ontario, part of the company's overall $560 million investment in modernization ("Kitchener's loss, Hamilton's gain," 2011). With nearly 20% of the Kitchener factory's workers over the age of 55 when the plant was set to close (Rose Simone, 2012), a task force was established in 2011 – years before the plant closed - in an effort to find future tenants for the building and also to help retrain workers ("Task force to aid Schneiders' workers," 2011). What was once considered to be a generational employer in Kitchener with over 3,300 employees at its peak (Mercer, 2014), came to an official end as the last tube of bologna came off the production line on February 27, 2015 (Mercer, 2015a).

With the property up for sale, speculation began as to what the future of the site could hold, with the building viewed by Maple Leaf as having no value as a manufacturing facility. Despite the site being over 90 years old, little value was seen in retaining the historic building as part of similar adaptive reuse projects that would see the property redeveloped as office or loft space: "My gut is that someone will want to start from scratch. […]. The Slaughterhouse Lofts doesn't have the same cache. Those buildings have a lot of challenges with them, and I don't see any of them having that same character" - Director of Commercial Real Estate Company (Mercer, 2015b).

Figure 5-9: Schneiders factory demolition (2018)

Source: Cameron Miller

Redevelopment plans for the site first began when it was purchased by Auburn Developments in 2017 after sitting vacant and without a buyer for over two years (Gooden, 2017). Early predictions that the existing buildings had little value were not entirely true, with Auburn Developments retaining about one-third of the structures, citing the building's strong structural integrity and their ability to be easily reconfigured (personal communication, May 22, 2019). With a majority of the site demolished and approximately one-third of the buildings retained to-date, the future of the site has shifted from solely employment uses to the largest infill project in the Region, comprised of a mixed-use development containing residential,

commercial and office use spaces (CBC News, 2017). Recognizing the importance of the 27.6-acre plot to the surrounding community, Auburn Developments has been actively involving residents in the redevelopment process, holding several public forums, naming contests and community barbeques on the former site ("Schneider Redevelopment," 2019).

Figure 5-10: Schneiders (2018). Pre-redevelopment and post-demolition.

Source: Cameron Miller

5.3.2 Budd Automotive

Address	1011 Homer Watson Boulevard
Location (Official Plan Schedule C1 and C2)	Suburban Area
Date original structure built	1966
Size of Property (ac)	120 acres
Approximate Percentage Reused	10.8%
Transit	24 GRT, 0 LRT
Zone (By-law 85-1)	EMP-2 / COM-3
Former Use	Car Frame Manufacturer
Current Use	Under redevelopment (Multi-use planned)
Funding Source(s)	Private with public assistance
Main Conversion Costs	$4,500,000 (Plus $8,600,000 Remediation)
Owner / Developer	Gary Ball & 1869071 Ontario Inc

The 120-acre parcel of land that once housed car frame manufacturer Budd Automotive has sat vacant for nearly ten years, conspicuously located at the corner of two main intersections: Homer Watson Boulevard and Bleams Road. Budd Automotive, also referred to as Kitchener Frame, was built in 1966 on the outskirts of Kitchener, isolated from development of any kind. Once the largest employer in Kitchener with over 3000 employees at its peak in 1979 (Van Alphen, 2008), Budd's history is marked with labour disputes generated by the company's efforts to remain competitive in increasingly international markets and amidst changing consumer demands. As a result, the company saw various strikes over its 50-year history (see Figure 5-11 below). By 2001, the company's employment base had shrunk to just 1900, and parent company ThyssenKrupp had invested heavily in making the car frame manufacturer competitive again with a $150-million investment in state-of-the-art equipment. In the years following, investment appeared to do little to help the company to rebound, posting losses for four consecutive quarters in 2002 (Keenan, 2001). In an effort the keep the facility operating, the union agreed to incentive-based work and relaxed labour rights. However, after failing to secure

a new contract from General Motors, the plant announced in February of 2008 that it would be closing by 2010, with the CEO citing a high Canadian dollar and shifting market preferences that made the company uncompetitive. This move saw the elimination of the 800 jobs that remained at the plant (Van Alphen, 2008).

Figure 5-11: Budd Automotive workers striking (1979)

Source: University of Waterloo Special Collections

Since the site was purchased in 2010 for $15 million (Flanagan, 2012), the former Budd Automotive property has been the subject of a lengthy redevelopment process, due in part to contamination as well as a legal fight that saw the fate of the property placed in the hands of the Ontario Municipal Board in 2013. A site plan originally submitted to Kitchener's council in 2013 for the 32-acre parcel included seeking to rezone a 28.3-acre portion of the property from its "General Industrial Zone" (M-2), to "Community Shopping Centre Zone" (C-3), which would permit a range of commercial uses including grocery anchored retail. This proposal was rejected

by Kitchener's council, which cited the need to protect employment land in the City of Kitchener (CTV Kitchener, 2018), a decision which was subsequently appealed by the developer. After an Ontario Municipal Board Hearing in October of 2013, the city and the applicant came to an agreement which settled on a modified proposal. These modifications included a provision that 94 acres of the property would remain industrial, while 25 acres were to be rezoned to permit retail use. The remaining 3 acres of land were set aside for medical uses. In addition, the city gained possession of the neighbouring 40-acre Budd Park which contained a number of indoor and outdoor soccer fields, as well as multiple baseball diamonds (Pender, 2013).

Figure 5-12: Aerial of Budd Automotive (2002)

Source: Robert Wilson

Following the rezoning of the property, Phase One and Phase Two Environmental Site Assessments demonstrated that the property was severely contaminated with industrial solvents commonly used in metal working such as petroleum hydrocarbons, polychlorinated biphenyls

and polycyclic aromatic hydrocarbons in both the soil and groundwater. These findings required the excavation and removal of nearly 10,000m^3 of contaminated soil (Williams, 2018). To offset the significant costs associated with this site cleanup, the owners applied for assistance under the Brownfield Financial Incentive Program in May of 2015. Approved by the City of Kitchener in May 2018, the owners were able to submit $7,877,000 as costs associated with directly remediating the site, and an additional 10% ($778,700) of indirect costs accrued. In total, approximately 60% of these costs will be covered by the Region, with the remaining 40% to be covered by the City of Kitchener through a tax increment grant. These payments are to be made over a 15-year period that could begin in 2021 when the site's redevelopment begins.

What was once Kitchener's largest employer has since become the area's largest brownfield redevelopment project (Williams, 2018). As part of the site's redevelopment, less than 11% of the original manufacturing facility has been retained which includes two buildings, one 50,000ft^2 and the other 80,000ft^2 (see Figure 5-13). Their age – constructed only fifteen years ago – has resulted in a built form that is structurally sound and easily adaptable for new industrial tenants (Davis, 2016). After remaining vacant for over a decade, the redevelopment of the site has been celebrated by many, with a ground-breaking ceremony held on September 9, 2019 for the construction of a 35,000ft^2 medical facility attended by Kitchener's mayor and other local politicians (Villella, 2019). As redevelopment begins, the site's location, in close proximity to Highway 401 and other major regional roads (i.e. Homer Watson Blvd.), appear to be one of the site's main assets: "It's a tremendous location. That's probably the most interesting thing for us," – Gary Ball, site developer (Flanagan, 2012).

Figure 5-13: Aerial of former Budd Automotive site (2018)

Source: Google Earth

5.4 New Internal Use

5.4.1 Breithaupt Block

Address	51 Breithaupt Street
Location (Official Plan Schedule C1 and C2)	Core Neighbourhood
Date original structure built	1903
Size of Property (ac)	4.25
Approximate Percentage Reused	100%
Transit	83 GRT, 3 LRT
Zone (By-law 85-1)	M-2
Former Use	Rubber manufacturing
Current Use	Office
Funding Source(s)	Private with public assistance
Main Conversion Costs	$22,147,500
Owner / Developer	Perimeter Development Corporation

Located in Kitchener's Core Neighbourhood, 51 Breithaupt Street represented one of the many manufacturers of rubber products that existed in Kitchener in the late 19th and early 20th centuries. The building was first occupied by Merchants Rubber in 1903 and was later used in 1926 by Dominion Rubber – Kitchener's largest employer at the time. The rubber products produced in the building varied over time, as it began by producing rubber footwear from 1926 until 1956, after which point it became part of the general products division of the United States Rubber Company (Uniroyal Ltd.). From 1956 until 2008, the building operated under various banners, producing automotive components until its closure in 2008. The building's previous use is reflected of the site's current zoning, M-2 ("General Industrial"), which limited the prospects of the site to other employment uses such as office space or warehousing. The property was purchased by Perimeter Development in 2009, who envisioned developing the building as "trendy commercial space" (Dalton, 2010).

Figure 5-14: Former Dominion Rubber site, pre-adaptation (2012)

Source: H.G Watson & Breithaupt Block

The property's zoning enabled the developers to move forward with their vision, pending necessary remediation and minor variances to recognize deficient setbacks and reduce parking requirements (personal communication, December 5, 2019). This building represented the first phase in a three-phase development plan put forth by Perimeter Development Corporation which is set to culminate with the proposed construction of a new office high-rise. Environmental site investigations confirmed the site's contamination as a result of both on-site and off-site operations associated with the building's historical use in both the soil and groundwater. In March 2012, Perimeter Development Corporation applied for assistance under the Brownfield Financial Incentive Program, submitting a maximum of $1,559,993 associated with remediating the site. As per the structure of the program, 61% of these costs were covered by the Region and

the remainder by the City of Kitchener. These costs were approved by the Planning and Works Committee in September 2012, and were issued over a period of three years, which commenced when the property was fully remediated and redeveloped.

The transformation of 51 Breithaupt has been made possible mainly through private investment and was supported by government incentives to assist in remediating the property (e.g. BFIP). Overall, $22,000,000 was spent on interior renovations to transform the former factory into the award-winning Breithaupt Block (see Figure 5-15). Interior alterations were undertaken in sequence, beginning in 2012 and having been largely completed by 2016. This included several permits issued which ranged from $255,000 to $1,500,000 for interior alterations to create office space for companies such as BDO Canada, Dillon Consulting and Workplace One. Other large capital investments involved $5,000,000 to outfit the building with washrooms, corridors and upgrade the mechanical and electrical systems. The largest investment in the property was through a $15-million-dollar investment to create office space for the site's largest tenant: Google. These renovations have encouraged continued investments in the area; with the owners of Breithaupt Block announcing a $157 million investment that will add more than 300,000ft^2 to meet increasing demands for office space (J. Jackson, 2019).

Figure 5-15: Breithaupt Block, post-adaptation (2019)

Source: Cameron Miller

5.4.2 Lear Automotive

Address	530 Manitou Drive
Location (Official Plan Schedule C1 and C2)	Suburban Area
Date original structure built	1955
Size of Property (ac)	20 acres
Approximate Percentage Reused	100%
Transit	18 GRT, 0 LRT
Zone (By-law 85-1)	EMP-2
Former Use	Automobile seat manufacturing
Current Use	Aeroponic Cannabis Producer
Funding Source(s)	Private - $18.5 million
Main Conversion Costs	$4,300,000
Owner / Developer	Nathan Woodworth (CEO)

Constructed in the mid-1950s, the former Lear Automotive plant at 530 Manitou Drive in Kitchener (see Figure 5-16), was previously home to Lear Corporation's automotive seating division, and employed roughly 1,500 people at its peak (R Simone, 2015). General Spring Products – which would later become part of Lear Automotive – began as a small operation on Charles Street in Kitchener in 1924, employing just 20 people. In 1954, General Spring Products was acquired by American Metal Products of Detroit, who later sold the Charles Street plant in pursuit of a larger facility on Manitou Drive. By November of 1966, General Springs was purchased by American-based Lear Siegler Inc. who later merged the companies under the Lear Siegler banner (Moyer, 1979). Under Lear, the Kitchener facility built automotive seating components for Ford, Chrysler and General Motors (Mercer, 2015c).

Figure 5-16: Aerial view of former Lear Automotive plant from Manitou Drive (2016)

Source: Cushman and Wakefield Waterloo Region

Throughout its history, the facility weathered several periods of economic turbulence including the economic fallout of the 1965 Auto Pact and the 2008 Recession (see Figure 5-17). With increasing competition, the plant was rumoured to be closed by its American parent company for years, when finally in May 2015 it was announced that the Kitchener facility did not secure any new contracts and would in fact be shut down (CBC News, 2015). Before this announcement, several efforts were made to keep the plant open, including a lower wage structure that was agreed to in 2012 (Simone, 2015). At the time of the closure, Lear employed 150 people, only a fraction of the workforce that the plant had employed in its prime.

Figure 5-17: Workers striking in front of Lear Automotive (1973)

Source: University of Waterloo Special Collections

As the plant closed, commercial real estate agents suggested that the site would most likely be subdivided to support multiple, smaller users (Mercer, 2015c). With a list price of $6.6 million (The Record, 2016), the site required a tenant who was able to devote substantial investment to modify the building to suit their needs. In 2017, it was announced that the building would be the new home of James Wagner Cultivation ("JWC"), a cultivator of aeroponically produced cannabis. Since being occupied, the exterior of the building has not changed (see Figure 5-18), as the majority of the conversions to the structure have been focused on the interior. According to building permits issued since JWC has occupied the space, over $4,300,000 has been spent on various construction including: flowering rooms, new partition walls, HVAC systems and renovated office space to suit the new tenants. With plans to hire up to

600 people (Mercer, 2017), JWC's expansion and investment in Kitchener has been well received by nearby residents, who are excited that the building has found new life: "I just love to see that we didn't sacrifice a building and a piece of history. We instead reinvigorated it and repurposed it, and for a great new purpose" – Waterloo Resident (Outhit, 2018).

Figure 5-18: James Wagner Cultivation (2018)

Source: Cameron Miller

5.5 Major Site Contamination

5.5.1 The Arrow Company

Address	112 Benton Street
Location (Official Plan Schedule C1 and C2)	Core
Date original structure built	1913
Size of Property (ac)	2.21
Approximate Percentage Reused	100%
Transit	91 GRT, 5 LRT
Zone (By-law 85-1)	CR-3 (Commercial Residential)
Former Use	Clothing manufacturing
Current Use	Lofts
Funding Source(s)	Private with public assistance
Main Conversion Costs	$25,569,691
Owner / Developer	Auburn Developments

Since its construction in 1913, the Arrow Company served as a manufacturer of various textiles including collars, dress shirts, pajamas and men's shirts until its bankruptcy in April 2001. Arrow's presence in Kitchener was significant, as the company claimed the title of the most modern shirt plant in North America in 1954 (Moyer, 1979). Located on the corner of Benton Street and Courtland Avenue, the Arrow Factory was located just on the outskirts of the downtown core, near other factories and within minutes of Kitchener's Victoria Park. A typical example of industrial architecture characteristic of the 1900's, the Arrow Factory building exterior was flush with windows to allow for natural light to enter the factory with mushroom-capped pillars lining the interior. In spite of the closure of the Kitchener facility, Arrow remains a large producer of men's shirts and clothing accessories, licensed under Cluett, Peabody & Co. Inc., which manufactures textiles in countries with considerably lower operating costs than Canada (i.e. Bangladesh, India).

Figure 5-19: Arrow Shirt Factory (1983)

Source: University of Waterloo Special Collections

Shortly after their closure, the Arrow Factory building became vacant and began noticeably deteriorating, and private security was soon required to patrol the site in hopes of preventing further vandalization (personal communication, April 11, 2019). With a growing number of vacant properties in the downtown, Kitchener made significant financial commitments to revitalization through increased urban densities, amending its CIP boundaries to include the site and promoted increased investment in its downtown as part of the Region's newly initiated Regional Growth Management Strategy. The site was purchased in 2002 by Auburn Developments and before construction could begin, Auburn excavated nearly ten metres below

grade to remove approximately 2,000 tonnes of contaminated soil and a 45,400-litre underground storage tank (Pender, 2010). Despite these policies which had been put in place to support a successful project, the market for loft style housing remained untested, and to mitigate the capital risk Auburn required pre-selling 80% of the units before construction began (Ibid.). Auburn capitalized on numerous incentives offered by the City of Kitchener which further facilitated the redevelopment of the site. These included Brownfield incentives and Downtown Kitchener CIP – making it exempt from both Regional and City development charges and parkland dedication fees (personal communication, April 11, 2019).

Figure 5-20: Former Arrow Shirt Factory (~2003), Pre-adaptation.

Source: http://abnf.co/CAN-arrow_shirt_factory.htm

With the strong structural integrity of the building, the bulk of the conversions required to convert the former factory were interior in nature. In total, $25,569,691 was spent to convert the building from a former clothing factory to a 136-unit residential loft development. This began with a three-storey addition in 2006 at an estimated cost of $500,000, increasing the Floor Space Ratio from 4.0 to 5.0, something that was requested in Auburn's application to rezone the property. This was followed by the construction of a $4,000,000 parking garage which was necessary to meet parking requirements under the "Commercial Residential" zoning. In 2011, the permit for the largest capital cost of the project was issued, which saw $20,000,000 in interior renovations to fully transform the space into what is now known as the Arrow Lofts. Nearly ten years after the site was originally purchased by Auburn Developments, occupancy of the building was granted and the units began to be sold, validating the demand for loft style conversions in Kitchener.

Figure 5-21: Arrow Lofts (2018)

Source: Cameron Miller

5.5.2 Electrohome

Address	152 Shanley Avenue
Location (Official Plan Schedule C1 and C2)	Central Neighbourhood
Date original structure built	1887
Size of Property (ac)	0.87
Approximate Percentage Reused	100%
Transit	53 GRT, 1 LRT
Zone (By-law 85-1)	R-6
Former Use	Furniture Manufacturing / Art Rite Advertising
Current Use	Vacant
Funding Source(s)	Unsuccessful tax sale
Main Conversion Costs	Not yet initiated
Owner / Developer	City of Kitchener

Located in the heart of a residential suburb, the former Shanley Street furniture manufacturing site comprised a part of the nearly 1.6 million ft^2 of Electrohome Kitchener factories in the 20^{th} century (Streicher, 2010). Founded by Arthur B. Pollock in 1904, Electrohome pioneered the hornless phonograph, contributing to expanded knowledge of radios and televisions that accelerated their development. While most operations resided in buildings located on Duke Street in Kitchener, the Shanley Street plant built in 1887 served the consumer division, manufacturing furniture to complement their popular line of televisions (Moyer, 1979).

Figure 5-22: Electrohome plant (n.d.)

Source: University of Waterloo Special Collections

By the late 1960s Electrohome-brand products were sold in 23 countries and had amassed nearly $44.5 million in sales and had meanwhile become the second largest employer in Kitchener, second only to Dominion Rubber. In an increasingly competitive space, Electrohome's role as a global player began to shrink, and its operations in Kitchener eventually ceased, with their last Kitchener building having closed in 2004 (Streicher, 2010). Companies such as Art Rite Advertising capitalized on Electrohome's downsizing and eventual closure, acquiring the Shanley Street building; however, it was Art Rite Advertising's legacy that would define the building, as the company poorly disposed of waste paints and solvents that were used in their products. This has left the building severely contaminated and has made the site

financially prohibitive to redevelop, leaving it vacant since their bankruptcy in 1990 (Malone-Wright, 2018)

Figure 5-23: Abandoned former Electrohome building (2018)

Source: Cameron Miller

Since 1990, the building has continued to degrade, with the current owner failing to practice basic maintenance such as sidewalk clearing. Kitchener building permit records indicate that the 120-year-old building required interior work as recently as 2013 to maintain its structural integrity and repair water damage. The property taxes owed on the site have reached a staggering $1,086,116.41, forcing the City of Kitchener to hold a nearly 3-month long tax sale that ended in May 2018. In that period, the City only received one bid in the amount of $200,000, an amount

that they were not able to accept through tax sale regulations under the Municipal Act which state the purchase must cover all taxes owed on the property (Thompson, 2017a). A forced tax sale in February of 2019 saw the present owner receive a tax break of over $800,000. Under tax sale regulations, the city was required to notify the present owner, who was able to maintain possession of the site through agreeing to pay the city's minimum price of $445,000 (Thompson, 2019a).

Figure 5-24: Abandoned former Electrohome building (2018)

Source: Cameron Miller

Residents and City staff remain divided on the future prospects of the property, with many advocating for the property to be demolished. Among the advocates for demolition is Ward 10 Councillor Sarah Marsh, who was quoted calling the former furniture factory an "eye-

sore" (Thompson, 2017b). To drum-up creative solutions for the site, the City of Kitchener hosted a design charrette in April 2018. This design charrette found that most residents were in favour of a new building not exceeding six-storeys in height (Thompson, 2018). Under its present zoning as R-6, the site's prospects are largely limited to residential uses such as Street Townhouse Dwellings, a Duplex or a similar option. Moving forward, the potential for the site to be adaptively reused is unknown, as the uncertainty surrounding the building increases as bricks on the 120-year-old structure have begun to fall off the building, forcing road closures. After the city declared the building unsafe in May of 2019, the owner was forced to choose to either repair the building or demolish it. Rather than demolishing the site, the owner has opted to invest nearly $600,000 in remedying structural issues, work that began in August 2019 (Thompson, 2019b), and that continues to work towards fulfilling the neighbourhood's vision for the site (see Figure 5-25).

Figure 5-25: Visualization of Electrohome's maximum building volume

Source: 152 Shanley Street Vision Statement (2019)

5.6 Case Study Analysis

Of the selected case studies, there was an even split in the number of case studies that required amendments to official plan designations or zoning permissions to allow the adaptive reuse of the site. The age of Kitchener's By-law – first approved in 1985 – has allowed for a broad range of permitted uses within industrial zoning classifications. As expected, the sites that required policy amendments either were subject to large redevelopments that significantly altered their use profile (i.e. Schneiders, Budd Automotive), or were converted entirely from industrial uses to residential uses (i.e. Arrow Lofts). Other sites such as Catalyst137 and Breithaupt Block did not require policy amendments since their use remained employment in nature, despite switching from industrial to office uses. For Lot42 and JWC, classifying their permitted uses was achieved in collaboration with City staff since they were not expressly listed in their industrial zones (i.e. Global Flex Campus and Cannabis cultivation).

Some studies highlight how the previous use of a building can make it more or less suited to particular end uses for adaptive reuse projects. According to Loures & Panagopoulos, (2007); Tan et al. (2018), multi-storey buildings that housed light industry and were located in the urban core were prime candidates for conversions to condominiums and office space. This is consistent with trends found in the present study, highlighting cases such as Arrow Lofts and Breithaupt Block. While Breithaupt Block contained significant contamination as a result of its previous heavy industrial use, these externalities were outweighed by the tenant's desire for brick and beam industrial architecture, close to the downtown core. Inversely, single-level industrial buildings on the urban periphery were commonly maintained as employment related uses.

Similar to findings established by (Sahraiyan & Tümer, 2017), the value in larger industrial buildings resulted partly in their ability to be utilized for a variety of different uses. According to Sahraiyan & Tumer, (2017); Shipley et al., (2006), sequential forms of development, which saw several tenants share one space, further increased a site's eligibility for adaptive reuse. Many of the sites studied are either multi-tenant or underwent sequential forms of development. This allowed for 100% of the structure to be preserved as part of redevelopment plans, including sites JWC, Catalyst137, Lot42 and Breithaupt Block. Similarly, the existing configuration and age of very large sites such as Budd Automotive and Schneiders limited their ability to be used for a variety of functions, consequently resulting in the majority of these structures being demolished.

As expected, the cases selected required varying levels of investment to adaptively reuse the spaces (see Table 5-2). The most expensive conversions, as reported by construction costs on submitted building permits, were multi-level industrial buildings. This includes the Arrow Lofts which cost an estimated $25,569,691, while the nearby Breithaupt Block which had an overall price tag of approximately $22,147,500. Out of five of the eight sites that have largely completed their overall conversions, Lot42 had the lowest cost of conversion at a total of approximately $1,030,600, preserving and building upon the site's industrial history.

Table 5-2: Main Conversion Costs of Selected Case Studies

Site	Construction Costs (Main conversion costs only)
Catalyst137	$14,022,500.00
Lot42	$1,030,600.00
Schneiders	Construction not yet initiated
Budd Automotive	$4,500,000*
Lear (JWC)	$4,000,000.00
Breithaupt Block	$22,147,500.00
Arrow Lofts	$25,569,691.00
Electrohome	$0.00

Source: City of Kitchener, Author's Calculations
*Project not fully complete

5.7 Interview Findings

The following section discusses the findings generated from interviews conducted with eight (8) key informants. The interview findings are structured based on the identical themes used in the interview guide; these themes include: Site Condition, Financials and Process.

5.7.1 Site Condition

In the eight selected cases, location proved to be the most important factor when determining a former industrial site's eligibility for reuse, a trend consistent with findings established in previous research (Eppig & Brachman, 2014; Tan et al., 2018; Wilson, 2010). Notwithstanding, the value in location is subjective and varies substantially based on what is perceived as valuable for the site's new user: "I think location is key for this site. It's sparked a lot of interest because of its location – it's in an established neighbourhood, it has historical significance and people like that". More specifically, for sites that underwent major redevelopment (i.e. Schneiders, Budd Automotive), their location relevant to transportation networks such as Highway 401 and transit lines served as important factors in their

redevelopment. Further, several sites listed their proximity to Light Rail Transit stops as an important network for their users, which increased pedestrian access to their sites and reduced automobile dependency. Other locational factors included high visibility, connectivity to infrastructure and a culture of surrounding investments, particularly in the downtown core. Additional factors that improved the site's candidacy for reuse included the perception that the outset cost was lower than new construction, a finding that remains a point of disagreement amongst scholars (Ball, 1999; Bullen & Love, 2011; Shipley et al., 2006).

Despite having a lower outset cost than new construction, adaptive reuse was perceived as being more challenging than greenfield development as a result of uncertainties, namely contamination and associated studies (e.g. Environmental Assessments, Record of Site Condition, Policy limitations). One key informant noted that the surrounding built form further complicates the process of adaptive reuse:

> Any infill and any adaptive reuse [project] is a hundred times harder than greenfield. You're changing something that has existed, that the city has grown around […], people who have gotten used to the way it is.

In addition to the potential for public resistance to change, the majority of key informants described the site condition at the time of purchase as overwhelmingly negative, spurring major redevelopment. In spite of this, the appeal in industrial buildings that were reused stems from the difficulty in replicating sought-after aspects of industrial architecture (i.e. high ceilings, historical significance, brick and beam). These sites were commonly cited as an important economic and cultural resource, an appeal that could not be replicated in new construction, consistent with Burchell & Listokin, (1981); Shipley et al., (2006).

Of the single level factories, the majority were seen as having zero architectural value and were therefore preserved for other reasons, with the primary reason being sound structural integrity of the building, a major factor that was consistent with findings from previous studies (Bullen & Love, 2011; Loures & Panagopoulos, 2007). The importance of structural integrity was echoed by one key informant:

> Well it's a sixty-year old industrial building. I looked at dozens of them, before we settled on this site for a variety of reasons. The structure itself is sound, the bones of this building are strong, it's been here for a long time. That said, 60 years of use was pretty dirty, and what we do require is a completely clean space, and so it needed a lot of work in that regard. But it was accomplishable, we can see the potential in the structure.

Key informants described vacant industrial buildings as opportunities; they were willing to undergo extensive clean up and retrofitting of a structure that they believed had potential to be revitalized to suit their vision. Moreover, there were instances where compromises were made in exchange for short-term benefit. While the outset cost of an adaptive reuse project was considered by many to be lower than a comparable new build, there were unforeseen costs associated with older industrial buildings, including aging infrastructure and necessary retrofits. Bullen & Love (2011) claimed that these unanticipated costs were associated with poor building techniques, many of which were characteristic of early 20th century construction. However, the selected cases were characterized as structurally sound, requiring maintenance and renovations associated with the age of the infrastructure rather than the way the buildings were erected, and thus the present study has not reflected this conclusion.

5.7.2 Financials

The majority of selected sites qualified for financial assistance, mainly through the Brownfield Financial Incentive Program, while some sites relied nearly entirely on private sources of capital to fund redevelopment plans. One 2006 study claimed that adaptive reuse in Kitchener was double the price of a comparable new build (Shipley et al., 2006); however, this study predated the existence of the modern Brownfield Financial Incentive Program. These financial incentives have largely remedied the apparent cost uncertainty, associated with adaptive reuse projects and has provided considerable financial assistance to aid in the clean-up of contaminated sites, a program utilized in the majority of selected sites. Further, the present study contradicted these claims, finding that adaptive reuse had a lower outset cost than a comparable new build.

In certain instances, buildings were able to utilize unconventional sources of capital, including industry specific grants that helped to mitigate financial uncertainty. Likewise, there were several instances in which upgrades to infrastructure, including replacing windows, lightbulbs and other systems, qualified through programs such as the 'Save on Energy' program. While most property owners were made aware of any applicable incentives or grant programs by the City of Kitchener during development application stages, others appeared to lack adequate staff to assist in applying or identifying opportunities for additional financial assistance:

> We did not go after any assistance and programs partly because we didn't have anyone in here to do that and we weren't aware and also, we didn't do it in that order. So, it was kind of a different way of doing it. Would we have liked to? Yeah, it would have been nice at the beginning.

Despite varying levels of uptake of financial incentives by property owners, there was a clear consensus among key informants that they perceived financial incentives as essential to facilitating the adaptive reuse of former industrial sites.

5.7.3 Process

In directing areas of future improvements, attention was consistently drawn towards a desire for increased flexibility when dealing with the transformation of legacy industrial sites. In some instances, developers of former industrial sites were restricted from achieving design goals such as adding windows, solar panels and alternative heating systems due to building code requirements that made the projects unfeasible:

> The building code has changed a lot, and it doesn't matter if a building has stood up for 50 or 60 years, the fact is that the way we calculate snow loading is different, which means that large sections of the roof need to be reinforced as soon as you occupy that area for anything other than its original intended use. So, you have to anticipate the way that the code is going to require you to adapt so even if it appears completely sound.

As one key informant described, there were limitations associated with working with an existing building. When comparing greenfield development to adaptive reuse project, greenfield was characterized as an opportunity to build to suit, while maximizing efficiency and avoiding the need for the lengthy site remediation process often associated with adaptively reusing a former industrial site.

With adaptive reuse consistently cited as being more challenging to develop than a greenfield development, key informants offered other areas in which the policy could be

improved to ease this process, where possible. Consistent with findings from Ball (2002), key informants identified partnerships between public sector staff and private developers as the most essential component in encouraging the adaptive reuse of former industrial sites that may be difficult to repurpose due to contamination or aging infrastructure. Other factors that were suggested included the continuation of incentive programs geared towards brownfield redevelopments.

There are several unique factors that have played into the adaptive reuse of many of Kitchener's former industrial sites. This includes the presence of local talent, namely in the technology sector, which has furthered the demand for character office space and appreciation for industrial architecture. These characteristics are in addition to the reputation that City staff have gained, specifically that there is a willingness towards redevelopment which has been reflected in their policy directives:

> I think the municipality is willing to assist and to see the value in businesses. I think, you know, Kitchener has a reputation of being fairly flexible and our position now as a tech hub for Ontario is largely because of the concept of repurposing. We've never been afraid to undertake, to change the way we use a space, to adapt to new technologies and new uses.

This reputation is partially the result of the significant investments that the City of Kitchener has made, including the installation of the LRT and the $110 million downtown economic development fund which helped encourage investment within the private sector, primarily in core areas.

Despite gaining initial popularity due to environmental concerns (Vrusho, 2015), sustainability played a minor or inconsequential role in the majority of adaptive reuse projects studied. While some sites undertook major renovations to increase efficiency (e.g. new windows, lighting, HVAC systems), interview findings suggested that these renovations were done in an effort to save on costs, rather than a token sustainability effort as previously suggested by Ball, (1999). Several adaptive reuse projects were described as areas where existing industrial and structural components could be levied in an effort to establish a formal sense of place:

> So, some of the things you want to do might not be possible because of the configuration of the building or certain things in the way. So, you adapt and you change to make it fit. An advantage is the structure is there, the bones are there, that's good so now let's pretty it up, let's give it that character. Whereas a new-build, you're designing the whole building from the ground up, so that's going to take a lot of time, a lot more money.

As the key informant described, the building's existing configuration was constraining and resulted in concessions in particular areas. In addition, the ability of a building to renovate or expand, was constrained by policy and regulations. The central policy constraint imposed on those undergoing adaptive projects surrounded zoning requirements. Specifically, the most cited policy constraint was a property's permitted uses, which limited the flexibility on particular sites (e.g. Lot42, JWC). Secondly, parking requirements were a major hurdle that needed to be addressed in adaptive reuse projects. With the existing configuration of older sites, several lacked the required number of spaces to meet modern parking requirements, which were needed to change the building's use. This resulted in several of the sites seeking relief from parking requirements through minor variances to the zoning by-law.

Langston et al., (2008) claimed that developers were compelled to preserve certain aspects of a building due to its age; however, in the eight selected cases, age was not a single determining factor for building preservation. Further, an older building did not equate to sought-after aspects of industrial architecture. Of the selected cases, varying characteristics of a building were valued. This resulted in the demolition of the original Schneiders plant – originally constructed in 1923 – while several buildings constructed in the mid-twentieth century were entirely preserved (e.g. JWC, Lot42, Catalyst137). Despite varying levels of preservation, the majority of sites took more than three years from the time construction was initiated until the property was occupied by its new users.

Projects with the least percentage of buildings reused experienced the longest construction timelines, with major redevelopment projects such as Schneiders and Budd Automotive estimating a timeline of over fifteen years until their respective projects are fully complete. Contamination and planning approvals were also a large factor in delaying various adaptive reuse projects, namely in the redevelopment of Budd Automotive and Schneiders, which required cleanup and approvals for zone change and official plan amendments.

5.8 Summary

In summary, findings generated through two primary forms of research found that location was the largest determining factor in a site's eligibility for reuse, confirming findings established in various other studies (Eppig & Brachman, 2014; Tan et al., 2018; Wilson, 2010). Other factors included structural integrity, sought after aspects of industrial architecture and the perception that adaptive reuse had a lower outset cost than a new build. The successful uptake of adaptive reuse in Kitchener has been attributed to significant investments on behalf of the City of

Kitchener and Region of Waterloo. This includes incentive programs targeted at adaptive reuse and brownfield remediation, while making targeted investments in transit and surrounding infrastructure projects. Working within a building's existing footprint was described as limiting; nonetheless, there were components of industrial aesthetic that could not be replicated in a cost effective manner. Moreover, the presence of information communication technologies furthered the demand for brick and beam office space that built upon Kitchener's industrial heritage. These conclusions were drawn from two methods of research, both case study analysis and interviews with eight key informants which allowed for a detailed study of the characteristics involved in the transformation of the selected sites. The following chapter: *Chapter 6: Conclusions & Future Research*, summarizes the key findings of this chapter and concludes relevant details of the study.

Chapter 6: Conclusions & Future Research

The sixth and final chapter discusses a summary of key findings generated through both case study research and interviews with key informants, while directing areas in which adaptive reuse policies could be improved, how the focus of said policies should be shifted and the final conclusions of the study.

To return to the focus of the study posed at the outset, the three research questions were as follows:

(i) Does a site's candidacy for adaptive reuse vary based on location?

Location was the most influential factor when determining a site's candidacy for reuse.

(ii) What is the most influential factor for developers who undertake adaptive reuse?

In order of frequency, the most influential factors were location, building size / flexibility of the space, outset cost perceived to be lower than new build and the historical significance of the site.

(iii) Are there any improvements that can be made to encourage developers to adaptively reuse rather than build new?

Key informants cited enhanced partnerships between public and private sector agents, maintaining incentive programs and increased flexibility for legacy sites.

6.1 Summary of Key Findings

Kitchener has experienced two waves of deindustrialization. The first occurred in the late 1990's and early 2000's and largely affected legacy industries within Kitchener's downtown. This includes Kaufman Rubber, Dominion Rubber, The Tannery and Rumpel Felt Company. The second wave occurred between 2008-2015 and broadened the scope of deindustrialization to Kitchener's urban periphery. This period saw the closure of many larger industries on the city's outskirts (e.g. MTD, Schneiders, Lear Automotive, Budd Automotive, Ledco Ltd.). The majority of industrial sites that remain are considerably leaner in size and employment base and are concentrated in a few industrial parks in Kitchener (i.e. Huron Business Park, Shirley Ave Industrial Area, Ardelt Industrial Area).

This structural shift in employment has led to a considerable inventory of former industrial sites which, when coupled with the demand for these spaces from new industries, has led to a successful uptake of the adaptive reuse of many of these sites. While the sites selected were diverse in size and were located across various areas of the city, location has served as the catalyst for the successful redevelopment of former industrial buildings in Kitchener. The value in location was subjective based on the proximity to nearby amenities, namely transportation networks such as the LRT, trails and major roads. The main reasons developers chose adaptive reuse rather than new construction was to retain the structural integrity and industrial features of the buildings and the perception that adaptive reuse had a lower outset cost than a similar new build.

Adaptive reuse was considered by many to be more challenging than a comparable new build; however, there was a perception that not only were the outset costs lower, but the

character of many industrial buildings could not be replicated. The outset cost of adaptive reuse of industrial buildings was significantly lowered by the availability of incentive programs, namely the Brownfield Financial Incentive Program, which assisted in removing the additional costs associated with site clean-up. Many sites, however, did not qualify or were unaware of financial assistance programs that may have been available to them and instead relied entirely on private capital. Other sites qualified for industry specific grants or rebate programs that allowed for them to retrofit and increase their energy efficiency. Despite a lower outset cost, many sites were limited in their ability to expand and to retrofit particular aspects of the buildings (e.g. solar panels) due to building code requirements that would have required an overhaul of existing infrastructure.

6.2 Contribution to Planning & Policy Improvements

Adaptive reuse is an inherent quality of planning; the use of pre-existing buildings is a central pillar in how planners adapt to changing circumstances and choose ways to grow in a responsible, space-conscious manner. At a municipal level, considerable efforts have been undertaken to help encourage the repurposing or remediation of industrial sites. Failing to maintain these programs and allowing the premature termination of certain components of financial incentives would be ill advised. While early policies have targeted Kitchener's core (e.g. Adaptive Reuse Community Improvement Plan and Development Charge exemptions), there are opportunities for further enhancements that target projects outside of core areas.

6.2.1 Programs

Since the inception of the BFIP, the City of Kitchener has made $37 million available to aid in the cleanup of severely contaminated industrial sites. This program has been effective in

kickstarting the remediation of brownfield sites and has brought the lands back into productivity. Prematurely declaring that the market of brownfield sites has largely matured in Kitchener through eliminating key components BFIP would setback progress made since the program's inception in 2006. With many of Kitchener's large industrial employers have since relocated, policies (e.g. economic development strategies) have suggested that the market for Kitchener's brownfield sites has largely matured. Notwithstanding, Kitchener still holds a considerable industrial employment base, that with any shift in labour market trends could result in the closure of one or many of the sites that remain. For this reason, it is important to remain proactive and maintain the program in its entirety, even if the uptake appears to be dwindling.

An independent review of the BFIP, summarized in an October 2018 staff report to Regional Council, found that a lesser financial reimbursement available for remediation would result in higher costs to the consumer and impact the feasibility of redeveloping brownfield sites. This sentiment was echoed by key informants who participated in the study, indicating that they perceived financial incentives as an essential component to encouraging the redevelopment of brownfield sites. Moreover, a large number of sites selected as part of this study received financial assistance under BFIP. Scaling back the program could result in similar projects being delayed or abandoned altogether due to financial constraints.

Further policy review conducted as part of this study indicated that there was an intention to limit the geographic scope of the BFIP to areas surrounding Kitchener's central transit corridors to focus on residential projects. Through the geographic refinement of the program, there would be severe implications on industrial sites that remain on urban periphery. Should there be large market factors that result in the closure of a large industrial employer, any contamination of the site that may have occurred over the history of the site may prevent a future

tenant from occupying the space. Specifically, this would impact other large industrial sites such as the many auto parts producers located in Kitchener's urban periphery (e.g. Ventra Plastics, Mitchell Plastics). The lack of assistance programs available to these sites due to their location would discourage other tenants to occupy the space as they would be responsible for remediation costs, if any, and would likely seek to locate elsewhere. A potential solution for this would be to maintain the current scope of the program, that reaches all areas of Kitchener.

Overall, property owners of repurposed industrial sites – particularly in the city's suburban neighbourhoods – did not qualify or were unaware of potential incentives. As cited by key informants, partnerships between Kitchener staff and developers were considered to be one of the most important factors in encouraging the adaptive reuse of former industrial sites. The City of Kitchener has been effective in increasing the availability of programs that are not just limited to projects in the core; however, these programs could be more effectively advertised to reach those who are undertaking adaptive reuse for the first time. While there exists a user friendly website that highlights incentive programs available to developers by local municipality (https://www.regionofwaterloo.ca/en/doing-business/development-incentives.aspx), it appears the lack of knowledge of programs available by some key informants suggest there are areas where direct outreach through the development of partnerships would benefit first time developers.

6.2.2 Investments & Partnerships

This research has highlighted the need for enhanced partnerships between public sector staff and those adaptively reusing former industrial sites. Partnerships were cited by key informants as a critical piece in encouraging adaptive reuse projects of former industrial sites, particularly those that may not be prime candidates due to contamination.

While the inventory of vacant industrial buildings in Kitchener has largely diminished, there are lessons that can be drawn from the experience of key informants with the adaptive reuse of these spaces. Location was cited as the most influential factor when determining a site's candidacy for reuse. While little can be done in changing the location of a building, the presence of investment and existence of nearby amenities has fostered an environment that encourages the redevelopment of these sites. A recommendation to address this would be continuing to make targeted investments in transit, public amenities and programs that encouraging development through enhancing the surrounding built environment.

Namely, large investment into the development of the LRT has connected sites on the urban periphery with sites located in the city's urban core. Most notably, sites located outside of the urban core, such as Schneiders, were able to see a switch from solely employment to mixed uses, in part due to the presence of the LRT which increased access to the site and reduced car dependency. These investments, along with the presence of financial incentive programs, have signaled to developers and investors that there is a willingness to see these sites return to productivity.

It was found that several selected sites underwent major renovations, which resulted in the need for the majority of new materials for construction and inversely, the large-scale disposal of material generated through demolition. One potential solution to address this would be to tie a portion of financial incentives geared towards the redeveloping industrial sites (i.e. BFIP, former ARCIP) to the percentage of building preserved. Specifically, sites that underwent major redevelopment such as Schneiders and Budd Automotive had very low percentages of building preservation at 37% and 11%, respectively. While developers should not be penalized for

demolishing buildings, which would discourage their redevelopment, the environmental and economic benefits of repurposing existing materials should be commended.

6.2.3 Maintaining a Diverse Employment Base

While the gentrification of the selected cases was not a focus of the interview findings, their transformation often marked a drastic change in the people they served. It is important to ensure that when the demand for a building's intended use decreases, that policy efforts are concentrated towards encouraging a diverse employment base that caters to varying skill levels to avoid industrial gentrification of former industrial sites. Manufacturing in advanced economies is evolving, experiencing investment in automation and advanced forms of manufacturing. Converting large parcels of employment lands to mixed use or entirely non-employment uses reduces the local capacity to support emerging forms of manufacturing that require large parcels and separation from sensitive land uses. Upholding these sites as employment type uses, when appropriate, would allow for investment in manufacturing to continue, and effectively contributing to a diverse employment base.

The investments and policies implemented by the City of Kitchener have been instrumental in encouraging the preservation of many former industrial sites and have brought these areas back into productivity. Despite this, my experience growing up in Kitchener has revealed many of these spaces transformed from areas of labour intensive forms of employment for varying skill levels to those that cater exclusively to high-skill forms of employment in the ICT sector. While the evolution of Kitchener's economy should be celebrated, the ICT sector has not created equal opportunities for those who once were employed in the spaces they now occupy. One potential solution for this would be to ensure that, where appropriate, industrial lands are maintained as employment type uses and not converted to commercial or residential

type uses. This is contrary to Kitchener's economic development policies, which have cited neighbouring municipalities such as Cambridge as more suited for industrial employment. To further study these impacts, future research should be directed towards examining the impact of the adaptive reuse of these former industrial sites on the labour market, particularly those who have been displaced as a result of deindustrialization.

The majority of sites that remained as employment type uses saw a shift from labour intensive manufacturing uses to emerging industries. One potential way to address this is to ensure that programs receiving financial incentives incorporate mixed uses into their development and consequently promotes a diverse workforce. Planners, economic developers and council are awarded the tools through the development process (i.e. Site Plan applications, Zoning and Official Plan amendments) to provide comment and ensure the vision for a remediated site is appropriate development and is not catering exclusively to those who are affluent or highly skilled. While the process is largely developer driven, in some instances the City of Kitchener has intervened when deemed appropriate. Specifically, when initial plans to rezone large sections of the former Budd Automotive site, city council demanded that the site remain largely industrial in nature.

6.3 Shifting the Focus of Adaptive Reuse

Through reviewing employment statistics and interviews with key informants, the supply of vacant industrial sites has been decreasing as Kitchener's industrial base has stabilized since its rapid decline from 2006-2015. Policies aimed at addressing vacant industrial buildings have been reactionary to present labour market trends. More specifically, as Kitchener was experiencing the loss of legacy industries within its Downtown (i.e. Kaufman Shoe Co. Arrow

Co., Dominion Rubber), the City's policies that followed were focused on addressing the area most in need – the core. Following the 2006 closure of the B.F Goodrich tire plant on Goodrich Drive in Kitchener, the early iterations of what would become the Regional Brownfield Financial Incentive Program were initialized, beginning a new focus on remediating single-storey factories located on the city's periphery.

With the 2013 end of the Adaptive Reuse Community Improvement Plan, the main incentives that remain for industrial developers and property owners are for the remediation and clean-up of contaminated lands (e.g. Brownfield Financial Incentive Program), in addition to regional and municipal development charge rate reductions or exemptions for new industrial development. While the interviews conducted during this study have concluded that these policies were effective in promoting redevelopment of these sites, there is no explicit directive that encourages these sites to be repurposed rather than demolished. In recognizing that each former industrial site has unique redevelopment prospects, incentives should be made available to developers who are willing to conserve existing built form in the outset and utilize existing materials, when possible. The benefits of this would be reciprocated through the diversion of waste that would otherwise be destined for landfills, while promoting sustainable development through minimizing the use of new construction materials.

6.4 Summary of Recommendations

A case study of the City of Kitchener found that the following recommendations should be considered by decision makers and public sector staff when directing policy efforts towards adaptive reuse projects. Overall the main lessons generated from this study are as follows:

1. Maintain the current scope of the Brownfield Financial Incentive Program.

2. Enhance partnerships between public sector staff and developers, particularly for first-time developers.

3. Invest in transportation and infrastructure projects at a local level that foster an environment for redevelopment.

4. Develop a needs-based incentive approach to sponsoring adaptive reuse projects, that rewards developers who re-claim building materials in new construction.

5. Ensure opportunities are afforded to workers of former industrial sites who have been displaced by larger market trends such as globalization.

6. Preserve industrial lands, when appropriate, to continue to support a diverse employment base.

7. Encourage adaptive reuse projects that create spaces that are not exclusive to those who are highly skilled and/or affluent.

6.5 Final Conclusions

Adaptive reuse has proven to be a viable option for vacant industrial spaces that has, in many ways, immortalized the industrial history of Kitchener's past. This city in particular has consistently shown resiliency in the way the economy has rebounded from large economic blows. The unfortunate decline of Kitchener's manufacturing base has created new opportunities and opened up physical spaces for emerging industries to thrive. Through a better understanding of the factors involved in a successful adaptive reuse project, the proper resources can be allocated to ensure Kitchener's industrial history continues to be honoured. The foundation of Kitchener's economy was built through industry, and the transformation of their spaces has demonstrated that its success lies with the businesses who have taken over these spaces.

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Appendix

Semi-Structured Interview Guide

Interview Questions:

- Do you consent to the audio recording of this interview for the lone purpose of transcribing at a later date?

- What is site name, and how do you see its role in the community?

- What is your role related to this development?

- How are these vacant industrial sites perceived?

Site Condition

- How would you describe the condition of the site when it was purchased?

Prompts

- ***Good*** *– Required little to no site cleanup, existing building(s) could be easily retrofitted*
- ***Fair*** *– Required minor site clean-up, existing buildings required major renovations to prepare site*
- ***Poor*** *– Required major site clean-up and / or many buildings were demolished to prepare for new construction*

- Do/Did you consider the site to have historical or architectural significance that is/was worth preserving?
  - What in particular?

Prompts

- *Façade*
- *Cultural significance*
- *Architecture of structure's interior*
- *Structural integrity*
- *Other – Please specify*

- How long did/will the site's transformation take?

- Did the site's previous use influence your decision to acquire the site?

- What were the most important determining variables when considering the site? What was the most important?

Prompts

- *Location*
- *Interior architecture / design*
- *Exterior appeal*
- *Large, easily reconfigurable space and / or site*
- *Cost perceived lower than new build*

Funding

- Which sources of capital were utilized to fund the purchase/lease and redevelopment of the site?

Prompts

- *Public*
- *Private*
- *Mix*

- Did the site require any remediation or clean-up that was required by law?

- Did the site qualify for assistance under programs and incentives for adaptive reuse projects or remediation?

- Which programs?
  - *If yes:* (prompts only) if no: why not?
    i) Did these programs play a large role in the decision to undergo adaptive reuse rather than new build?
    ii) Without the Phase Two Environmental Site Assessment Grant, would the financial risk increase in the redevelopment of your site?
    iii) If the site was no longer eligible for financial assistance, would the redevelopment no longer be financially viable?
    iv) Did the project receive any other forms of assistance or grants for site clean-up, or any other form of remediation?

Do you perceive government funding essential to encourage the reuse of former industrial sites?

New build / Reuse

- Why did you preserve what you preserved?
- Why did you decide to adaptively reuse rather than new build?
  - What about sustainability objectives?
- Did you foresee adaptive reuse as more or less challenging when choosing to develop?

Process

- What hurdles did you encounter / what hurdles do you perceive for developers when undergoing the process of reuse?

Prompts

- *Too long?*
- *Too many applications?*
- *Inadequate programs?*

- Were there any policy constraints (e.g. zoning limitations, building permits) that prevented you from achieving any design goals?

- Are there any improvements that can made on existing policies intended to address industrial vacancy and promote adaptive reuse in Kitchener?

- Are there particular characteristics of the Kitchener-Waterloo economy that have made these projects possible?

- What are advantages for developing a greenfield location versus redeveloping a brownfield or vacant industrial building?

- What else do you think can be done in encouraging the adaptive reuse of sites that may not be considered prime candidates for redevelopment (i.e. major cleanup or location constraints)?

Is there anything else you'd like to add regarding the process of adaptive reuse and site redevelopment?