THE PROBLEM WITH DENSITY

Addressing public perceptions of density in the suburban retrofitting process

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Supervised Research Paper
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September 2011

Abstract

Growing problems associated with sociodemographic and lifestyle changes within existing suburban areas have recently led planners and architects to focus on suburban retrofitting. Among a list of physical improvements, increasing density is one of the key solutions proposed by the suburban retrofitting literature. However, density is a complex concept, and the prevalent negative perception of density among the public must be addressed during the retrofitting process in order to avoid local resistance to necessary intensification. Thus, the primary objective of this research is to determine how planners can address perceptions of density to overcome this potential barrier to the success of suburban retrofitting projects. A case study of Markham Centre, a Canadian suburban intensification project, is used to examine the influence of density-supportive policy on changing density perceptions, and to learn how planners may address possible misperceptions about density. The paper concludes with recommendations for different stakeholders to ensure public perceptions of density are addressed and dealt with during the suburban retrofitting process.

L’évolution sociodémographique et les modes de vie changeants dans les zones suburbaines sont la source de problèmes qui ont amené les urbanistes et les architectes à revoir l’aménagement des banlieues. Parmi les améliorations possibles, la littérature portant sur le réaménagement des banlieues place la densification comme l’une des solutions à prioriser. Cependant, la densité est un concept complexe et est souvent perçue négativement par le public. Cette opinion doit être prise en considération lors du processus de réaménagement afin d’éviter l’opposition des résidents de la banlieue à une nécessaire densification. Ainsi, l’objectif premier de cette recherche est de déterminer comment les urbanistes peuvent changer les perceptions associées à la densification, cette étape étant nécessaire à la réussite des projets de réaménagement des banlieues. Une étude de cas de Markham Centre, un projet canadien de densification d’une banlieue, est utilisée pour examiner l’influence d’une politique de soutien à la densité. Cette étude permet de mesurer l’effet de cette politique sur les changements de perception en plus de comprendre comment les urbanistes peuvent corriger les perceptions erronées sur le phénomène de la densité. La recherche met de l’avant des recommandations destinées aux différents acteurs impliqués afin d'assurer que la perceptions du public de la densité soit prise en considération et corrigée lors du processus de réaménagement des banlieues.

Acknowledgements

This project marks the end of my time at the McGill School of Urban Planning, and the completion of the Master of Urban Planning (MUP) programme. For these reasons, I would like to take this opportunity to acknowledge the people who helped make this project possible.

I would like to thank my supervisor Professor Raphaël Fischler. From the time I was still fine-tuning my research topic, he provided guidance and pointed me to resources that helped my topic develop into one that I truly enjoyed researching. The timely meetings, valuable advice, and thorough feedback motivated me to do better each step along the way, and his attention to detail and professional attitude taught me lessons I will carry with me as I move forward in my life.

For making my case study possible, I would also like to thank my interview respondents. All of them went beyond simply answering my questions by taking the time to provide me with extensive and valuable information to ensure my research was complete. Their enthusiasm and support to help me with my project reassured me that the topic I chose is an important one that I should continue examining after my graduation.

My appreciation also extends to my second reader, Professor David Brown, for providing me with useful comments in the final stages of my project, and to Gladys Chan and Anand Sood, for always providing friendly advice with a warm smile.

I am especially grateful for my dear friends who supported me throughout this entire process, especially Jeff Robson, Gina Freeman, Paul Giang, May Pham, Etienne Faucher, Megan Rolph, Astrid Idlewild, Maks Wells, Emily Sangster, Nour Dib, Angela Barker, Moeza Merchant, Farah Fatima, and Erin Brennan. I am grateful for the skype chats, fun outings, delicious meals and coffee breaks that provided me with much-needed breaks away from my research to clear my mind and re-energize.

Finally, I extend my greatest gratitude to my wonderful family. My brother was always there to help me through any technical glitches, while my mother and father gave me advice whenever I experienced writer's block. Their patience and support during this process kept me on track, and this project could not have been completed without them.

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Introduction

For decades, the suburbs have been stigmatized and associated with many social, economic and environmental problems. Solutions have predominantly addressed how to design and build greenfield developments that would reduce or avoid these problems. This approach to solving 'the problem of suburbia' has resulted in a number of developments that have followed Smart Growth and New Urbanism principles. Although effective in its own way, this approach leaves out and ignores the countless acres of the conventional suburban landscape that already exists and continues to be the norm in most Canadian cities. With the added pressure of sociodemographic and lifestyle changes in these areas, planners and architects have recently shifted their attention to retrofitting the existing suburbs.

The suburban retrofitting literature proposes a number of solutions to update existing suburbs. These solutions include increasing land use mix, increasing density, adding active transportation infrastructure, and enhancing the public realm. When these solutions are combined and implemented together they can help update suburbs to achieve their full potential. However, in order to completely understand how these solutions can successfully work together, each must be examined separately to comprehend the complexities that underlie each concept.

This paper focuses on one of the solutions: increasing density. Density is a complex concept, and the difference between objective and perceived density could make or break the public support behind a proposed change. Prevalent negative perceptions of density held by the public is mostly based on fears related to the traffic impact or social discontinuity that a proposed intensification project may bring to the neighbourhood, and thus these perceptions may cause

nearby residents to object a proposed intensification project. If the majority of suburban retrofitting projects will increase density in existing areas, it is important for planners to address perceptions of density during the retrofitting process in order to avoid local resistance to necessary intensification.

The primary objective of this research is to determine how planners can address perceptions of density to overcome this potential barrier to the success of suburban retrofitting projects. There are three specific research questions: Is there a difference between how professionals and the public perceive density? Do perceptions change if policies are in place for higher density development in suburban areas (e.g., Ontario Places to Grow Act)? What strategies can planners use to communicate the benefits of density to the public in order to overcome public misperceptions during this process? By examining the process used by planners for suburban retrofitting projects and trying to seek strategies to overcome one of the potential barriers – the negative public perception of density – this research will be valuable in different ways. The findings will build on the existing knowledge and attempt to bridge the gap between theory and practice for suburban retrofitting, and by addressing how to overcome the potential barrier of density perception it will facilitate and encourage the option for planners to choose suburban retrofitting projects over new greenfield development in the suburbs.

This paper is divided into different chapters to help answer the research questions. *Chapter I* is an overview of the history of the post-war suburb and how it became the conventional suburb of North America. It examines the problems associated with this type of unsustainable development, and discusses how Smart Growth and New Urbanism planning approaches are addressing these problems. The chapter concludes with the argument that ultimately the most effective change will come from retrofitting existing suburban areas. Since

retrofitting suburbs is a relatively new subject, the most recent literature is analyzed to determine the ideas being circulated in this field.

Chapter II discusses the concept of density. It breaks down density into its different definitions based primarily on the work of environmental psychologists. The prevalent negative perception of density among the public is discussed, and there is a brief summary of its origins in the North American context. The chapter concludes by examining whether or not the beliefs underlying the negative perception of density are valid.

Chapter III presents a case study conducted to examine the influence of density-supportive policy on changing density perceptions and to learn how planners may address possible misperceptions about density. The case study will focus on Markham Centre, located in Markham, Ontario. Markham is one of nine municipalities in the Region of York, located directly north of the City of Toronto. Given its context, Markham is considered as one of many conventional suburbs in the Greater Toronto Area (GTA), which is a metropolitan area located in Southern Ontario that consists of the City of Toronto and its four surrounding regions of Halton, Peel, York and Durham. On a greater geographic scale, the GTA is part of the Greater Golden Horseshoe (GGH), a large-scale regional area that is centered on the GTA and covers the majority of Southern Ontario extending from Niagara Falls to Oshawa.

Though it is not officially labelled as a suburban retrofitting project, Markham Centre marks the location for one of 25 Urban Growth Centres (UGCs) identified in the 2006 Ontario Growth Plan for the Greater Golden Horseshoe under the Places to Grow Act to absorb a large portion of future projected growth through intensification. Markham Centre will bring greater densities to an established low-density area within the next 20 years, and so far it is considered a success by both residents and the municipality.

There are two main reasons why this particular UGC was selected as a case study for this paper. First, the importance of overarching retrofitting and intensification policies was stressed on numerous occasions in the suburban retrofitting literature. Establishing a regulatory framework that would promote and allow retrofitting developments is essential for retrofitting projects to proceed. Many municipalities in the U.S. and Canada either do not have such policies in place, or are in the process of developing such policies in response to public demand for sustainable development. Markham, however, does have a supportive regulatory framework in place at the provincial, regional and municipal levels. For this reason, Markham Centre serves as a good example for suburban retrofitting researchers to examine how a large-scale intensification project can proceed when supported by policies at multiple levels.

Second, Markham presents an interesting case study of a suburban municipality that has a history of trying to break the image of conventional suburban development. Unlike its counterparts, Markham has received international recognition as a suburban municipality that has been very active with New Urbanist projects. These projects were initiated before policy and zoning changes at the regional and provincial levels came into effect, and between 1994 and 1997 alone eleven secondary plans with varying use of New Urban characteristics were approved (Gordon & Tamminga, 2002). While a few of these, such as Cornell Village, are listed as official New Urbanist developments, the majority contain certain selected physical characteristics associated with New Urbanism. Having been exposed to Markham's long-standing effort to change its suburban development into a more sustainable format, residents may have changed their perceptions of density over time. In this way, focusing on Markham presents an opportunity to understand how residents' perception of density plays a role in accepting alternative forms of development.

The information used in the case study is based on a series of semi-structured interviews with key informants who work or live in the Markham Centre area. To begin selecting potential respondents, a list of professions was made to reflect all stakeholders that are typically included in the process of developing a suburban project. These professions were narrowed down to become 5 respondent categories that would provide a well-rounded sample with a variety of perspectives: councillors, developers, planners, key residents, and key local professionals. A maximum of two respondents for each category was set given time and resource limitations.

After examining media articles and official documents regarding Markham Centre, 10 respondents were selected, and a total of 9 respondents were interviewed: 1 Markham councillor; 1 Unionville Ratepayers Association (URA) representatives; 2 developers with extensive higher-density work in Markham; 1 Markham planner; 1 Region of York planner; 2 anonymous local professionals; and 1 anonymous local resident. For the purpose of this study, all respondents were classified as 'professionals' given their thorough knowledge about the topic compared to the general public. Further, although only two key local residents were interviewed, their extensive involvement in community discussions surrounding proposed development projects provided valuable information about the resident perspective despite the limited sample.

All the interviews were conducted in person with the exception of one of the developer interviews which was conducted via telephone. The interviews followed a schedule of 7 questions geared to answering the three specific research questions of this paper. Chapter III concludes with a summary of the respondents' answers as they relate to the research questions.

Chapter IV provides an analysis of the findings and provides recommendations for how planners can address the public negative perception toward density.

I The suburban problem

The origin of the modern suburb goes back to the bourgeois elite of late 18th-century London, England (Fishman, 1987). As a premodern city, London originally contained its elite population in the core while the residents of lesser income and social standing were located in the peripheral area along with manufacturers. The wealthy bourgeoisie lived in mixed-use buildings that contained both work and residence, and were primarily located in the urban core since it was the best location for conducting business.

However, by the late 18th century, this way of life began to change. A new domesticated, nuclear family structure emerged and turned the home into a domestic environment separate from the workplace. Free from having business dictate the location of the home, the bourgeois could live on the periphery of the city away from the lower-class population. Further, by choosing to live on the periphery, they could take advantage of the land economics that worked in favour of relocating to cheap, agricultural land and turning it into residential land to make a profit (Fishman, 1987). The combination of these changes enabled the development of the very first suburban residences.

It was not until the mid-19th century that decentralization and suburbanization began to take place on a larger scale. By this time, the industrial revolution had left many city residents living in poor conditions due to inadequate services and crowded housing conditions. An urban reform movement arose with the primary aim to improve housing, public health and governance, and many people began to see decentralization as the best solution (Harris, 2004). Eventually,

industry began to disperse to the peripheral areas, and was actually encouraged by suburban governments and land developers in order to attract housing development nearby for workers.

Decentralization was very appealing to residents, as it provided the privacy and access to nature that remained desired in the industrial cities. By the 1860s, the bourgeois of cities such as Manchester, Boston, and New York were following their counterparts in London by moving to the suburbs, drawn to the open space and vegetation of rural areas. However, this move did not mark a complete abandonment of the city. Rather, people who moved to the suburbs wanted to maintain the desirable qualities of city life in this rural context. As noted at the time by Frederick Law Olmsted (1992), "the present outward tendency of town populations is not so much an ebb as a higher rise of the same flood, the end of which must be, not a sacrifice of urban conveniences, but their combination with the special charms and substantial advantages of rural conditions of life" (p. 275).

The desire to combine urban and rural living became an important element in suburbanization, especially following Ebenezer Howard's influencial publication in 1898 entitled *To-morrow: A Peaceful Path to Real Reform*. Howard provided a detailed vision for self-sustaining new towns called 'garden cities' that could be developed outside of existing cities, and could offer the benefits of both urban and rural life. His diagrams illustrated the general layout for each garden city, but most importantly for the history of suburbs, he illustrated how these garden cities were to be separated by green space and connected by transportation lines. Although intended as a proposal for new towns, Howard's garden cities proved to be very influential in the development of suburbs from that point forward. As a case in point, two English towns, Letchworth and Welwyn, were built as garden cities shortly after the republication of Howard's book in 1902 (E. Howard, 1965).

New technologies were also important in this process of suburbanization, and the introduction of the electric streetcar in the 1890s served as an important catalyst. This was especially the case for cities in Canada at the time (Harris, 2004). Since Canadian cities were more compact than their American and British counterparts, the electric streetcar became an affordable means of transportation that allowed workers to live in the suburbs while working in a central area. By working in conjunction with suburban developers, the electric streetcar companies ultimately shaped and defined the suburban areas in cities.

Thus, by the start of the 20th century, industrial cities saw the middle class largely suburbanized, leaving the core areas with fewer residents and creating crowded, factory zones inbetween the suburbs and the core (Fishman, 1987). The suburbs that were built during this time eventually served as the models for the modern suburbs that were built in North America later on within the same century.

The large-scale, mass-built conventional suburbs typical of most North American cities did not exist until the end of World War II. Many believed this time marked the beginning of a possible return to a peaceful world. However, tensions were arising again. The United States and the Soviet Union, allies during the world war, were now in disagreement as the U.S. emphasized their desire to contain the spread of communism. As these events were unfolding, returning American war veterans were looking for a place to settle down and raise their families, but they were met with a housing shortage across the nation. To alleviate this problem and stimulate housing development, the federal government provided incentives from the federal mortgage system and funded large-scale infrastructure projects geared toward making cheap land accessible. Together, these federal programs provided the groundwork to develop the country's first and most influential large-scale suburban development: Levittown, New York.

Levittown presented a new type of suburban development that was unprecedented. Unlike the streetcar suburbs that were prevalent in most North American cities in the earlier part of the century, Levittown was characterized as a residential area containing low-density, single detached houses that were only accessible by automobile. It was also constructed using a new production line technique that ensured houses were constructed quickly and efficiently, and by July 1948 thirty houses were being built per day (Levittown Historical Society, 2011).

Most importantly, Levittown established a new suburban lifestyle. In addition to providing privacy, good health and access to nature as offered by earlier suburbs, the modern suburb provided homeownership for the new middle-class composed of average, working families. This allowed for a lifestyle that was based on consumerism and conformity, social values that were products of the political climate at the time. Since Soviet communism did not allow private ownership, the social equality that would arise with widespread homeownership was seen as a way to demonstrate the superiority of the U.S. and the nationalism among its citizens. As W.W. Jennings, a social scientist, stated in 1938: “Ownership of homes is the best guarantee against communism and socialism . . . owners of homes usually are more interested in the safeguarding of the worthwhile things of life and the traditions of our national history than are renters and tenants” (Baxandall & Ewen, 2000, p. 108). As a result, homeownership among average, middle-class people was important to Levittown, and the development’s physical design ensured residents had plenty of room to purchase numerous products. Going against this way of life was associated with going against one’s own nation, which, at the time, meant being a communist. As William Levitt mentioned in a local newspaper in 1948, residents were expected to see themselves as models of American democratic behaviour (Kelly, 1993). With the federal government playing a central role in its development and loans making it easier to purchase

anything one desired, the design of Levittown may actually be seen as one that helped produce and reinforce the era's dominant American social values (Beauregard, 2006; Kelly, 1993).

Together, these physical and social characteristics made Levittown a popular model for future housing development throughout the U.S. and Canada. Although the political climate eventually changed in the decades that followed, developers across the U.S. and Canada built suburban developments that replicated these features due to financial feasibility and market demand. The endless supply of open land at city edges was quickly developed, and soon enough the suburbs became the standard type of housing for middle-class citizens. Attaining a home in the suburbs and living its associated consumerist lifestyle became the ultimate goal and status symbol for families across the continent.

The Problem with Post-war Suburbs

The problems associated with low-density, large-scale suburban developments were not evident until a new ecological paradigm that increased environmental awareness in the 1970s. People moved away from a view where they had dominance over the natural world and access to an unlimited supply of resources, to one where they saw themselves as interdependent with the natural world which contained finite resources that should be preserved (Bell, Greene, Fisher, & Baum, 2001a). The idea of sustainable development followed when the World Commission on Environment and Development defined it in the 1987 Brundtland Report as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Sustainability could be achieved if there is a balance between economic, environmental and social demands. Since then, this concept has been applied to evaluate typical post-war suburban development and the extent of its negative consequences has been revealed.

Environmental Consequences

One of the biggest environmental problems attributed to suburban development comes from the automobile dependence it has created. The combination of poor transit service and the dispersed, single-use zoning in this type of development makes it impossible for residents to travel within or outside the neighbourhood without an automobile. Since emissions produced by automobiles create greenhouses gases in the atmosphere, this reliance on the automobile has contributed to global warming and other negative impacts related to climate change.

The environmental impact caused by automobile use is exasperated by the single detached, low-density housing of the suburbs. In a recent study, researchers at the U.S. Environmental Protection Agency (2011) found that multifamily homes consumed much less energy than single-family detached homes due to efficiencies related to compact size and shared walls between units. The study also revealed that energy consumption for different types of housing further depends on its location. If homes of any types are located in areas where there are opportunities to replace automobile use with transit or active transportation modes, household energy consumption levels may decrease by 39 to 50 percent.

Suburban development is also the main culprit behind the degradation of water systems and natural habitats surrounding most cities. The spread of the suburbs has become one of the greatest threats to wildlife as developers build over agricultural land and into forested areas containing essential habitat (B. C. Howard, 2011). Paving over greenfield with roads, houses and parking lots and draining water in storm-water systems not only destroys habitats for many of the animal species living there, but it also prevents water from entering the ground to be filtered to the aquifers below. This increases the amount of water that runs through the streams and rivers during wet weather, resulting in the erosion of these systems.

Social Consequences

Just as it has contributed to environmental damage, suburban development has led to a rise in a number of mental and physical problems for its residents. Automobile dependence attributed to this type of development once again plays a large role. The particulate matter sent into the atmosphere by automobiles, which include dirt, dust and chemical particles, have been linked to premature mortality, aggravated asthma conditions, and many chronic diseases such as cardiovascular disease (Frank & Engelke, 2005). Beyond air pollution, studies have found that the act of driving itself, measured by the amount of time spent in a car, is also detrimental to a person's health as it is positively associated with obesity (Frank, Andresen, & Schmid, 2004).

Many studies have also found that simply living in the suburbs is detrimental to a person's physical health. In general, those who live in sprawling neighbourhoods have lower levels of physical activity than those living in high-density, compact neighbourhoods. Recent research conducted by Ross, Tremblay, Khan and Crouse (2007) reaffirmed this association by finding that a person's Body Mass Index (BMI) is influenced by neighbourhood and metropolitan effects. In urban areas across Canada, the metropolitan level of sprawl had a greater influence on the BMI of both men and women than the density or medium household income of their respective neighbourhoods.

Economic Consequences

Since suburban development takes place at the periphery of cities and the majority of residents rely on the automobile to commute, congestion has increased in many urban areas and has proved to be very costly to the economy. According to the 2009 Urban Mobility Report by the Texas Transportation Institute, the number of hours of extra travel time that U.S. commuters spend in rush hour traffic per year has nearly tripled between 1982 and 2006 from 14 to 37 hours

respectively (Schrank & Lomax, 2009). Higher commute times due to congestion result in employees spending less time at work and feeling worn out after spending their time driving. This wasted time, combined with wasted fuel, is estimated to have cost major urban areas in the U.S. approximately $87.2 billion in 2007 (Schrank & Lomax, 2009). When looking at the problem of congestion holistically, the costs are even higher. According to the U.S. Department of Transportation's chief economists, the overall cost of congestion after taking into account the lost productivity, unreliability, cargo delay and safety, is close to $168 billion each year (Staley & Moore, 2009, p. 13).

The sprawling nature of suburban developments is also a threat to a city's local food source and agricultural economy. As new development encroaches on agricultural land, farmland values increase and place pressure on farmers to sell their land to developers. This creates a negative cycle that has available agricultural land moving further away to the periphery of urban areas while suburban development takes their place. Due to a combination of good crop markets, outside investors, favourable interest rates and tax incentives, and a strong housing market, farmland values across the U.S. doubled between 1996 and 2006 (Shapley, 2007). Advocates for ensuring urban areas protect and maintain land for local food production insist that this trend will prove costly in the future when high oil and energy costs will limit the amount of food that can be imported. A secure local foodshed will ensure an urban area's economy is resilient in response to such global changes.

Socio-demographic Changes

Changes in demographic and housing trends over the past two decades have also made the homogenous housing stock of the post-war suburb incompatible with modern-day needs. Whereas a suburban neighbourhood in the post-war years primarily consisted of white, middle-

class families, suburbs of the 21st century are much more heterogeneous regarding demographics, ethnicity and economic class. In fact, recent research has found that current suburban neighbourhoods in the U.S. are just as diverse as their inner city counterparts (Hall & Lee, 2010). This diversity requires a mix of housing options to complement the detached single-family dwellings prevalent in North American suburbs.

Two influential demographic changes have transformed the typical suburban profile: the ageing baby boomer population and shrinking household sizes. The baby boomer population group began to reach the age of 65 in the past decade, leading to an increase in the number of people in the retirement life stage. For Canada, the increase led to this group's record-breaking 13.7% share of the total population in 2006, and based on official projections this figure could double over the next 25 years (Statistics Canada, 2009). The increasing number of people in the retirement life stage group has raised questions concerning housing preferences. The maintenance of independence and social connections, and the desire to remain in a meaningful and familiar environment, are some factors that influence ageing people to continue to live in the suburban communities where they have spent most of their lives (Cutchin, 2003). However, 2 in 5 senior movers in Canada prefer to downsize to smaller homes, with those over 85 years of age preferring to live in an apartment due to reduced maintenance costs and work to keep up a home (Lin, 2005). As most suburban communities contain primarily one housing type – large, single-family, detached houses – seniors who wish to downsize have no choice but to leave their communities.

Shrinking household sizes are also placing pressure on the homogeneous housing stock of suburban developments. According to a recent Statistics Canada report by Milan, Vezina & Hall (2007), household sizes have been declining over the past century. In 2006, there were more than

three times as many one-person households (26.8%) as those consisting of five or more people (8.7%). Further, for the first time there were more census families comprised of couples without children than with children (42.7% and 41.4% respectively). Tough economic times and increased pressure on higher education have also resulted in a greater proportion of young adults aged 20 to 29 who continue to live in the parental home (43.5%). Further, a greater number of women are delaying childbearing, and have thus led to a greater proportion of young children aged 4 and under who have a mother in her forties (9.4%). Altogether, these changes result in a diverse household profile that no longer fits the typical single-family household that the post-war suburbs were originally designed for.

Due to the negative environmental, social and economic consequences of suburban developments and the changing socio-demographic profile in North America, it is evident that the post-war suburb is unsustainable. The family lifestyle and convenient mobility of the suburbs promised by Levittown no longer applies. Though people wanted auto-dependent suburbs in the 1970s and 1980s, preferences among residents have changed. According to a recent finding by the National Association of Realtors, 47% of households want urban living and 70% want to be able to walk to destinations. These are very different results from 10 or 20 years ago (Steuteville, 2011).

Even though the extent and impact of the environmental, social, and economic problems was still relatively minor, by the 1990s planners and architects had already begun considering a new approach to designing suburbs that would be more sustainable and meet current societal needs. The result of this process was the promotion of Smart Growth and New Urbanist practices which collectively came to transform the suburban landscape in the decades that followed.

Smart Growth & New Urbanism

The Smart Growth development approach and the New Urbanism movement are two recent planning efforts that have attempted to address the problems associated with suburban development by encouraging design solutions that balance needs in the three realms of sustainability. Although both began to emerge in planning discussions in the 1990s, they propose solutions that have been advocated by planners and architects since the industrial age presented the first set of problems associated with urban growth. These solutions have been collected and repackaged to offer suburban development alternatives that address the large-scale consequences of conventional suburban designs.

Smart growth refers to land use and development practices that promote compact and walkable mixed-use communities that reduce automobile dependency, protect open space, and use tax dollars more efficiently (Canada Mortgage and Housing Corporation, 2005). This planning approach takes an overarching perspective of issues that affect urban areas as a whole. Though it does address the problems presented by suburban development, many of its basic principles are general enough to be supported by a variety of interest groups across cities with differing problems and needs.

Under the umbrella of smart growth is the new urbanism movement. It is an urban design movement that is primarily advocated by planners and architects focusing on how the design of the built environment may influence social, economic and ecological aspects of places. In 1993, the movement's co-founders – Andres Duany, Peter Calthorpe, Elizabeth Moule, Elizabeth Plater-Zyberk, Stefanos Polyzoides and Dan Solomon – established the Congress for the New Urbanism and created a charter which outlines the movement's main principles to structure the built environment to make better communities (Congress for the New Urbanism, 1996). These

developments are based on the belief that certain design elements directly influence behaviour, such as bypassing the automobile and choosing to walk to local commercial areas as a result of the design of the area (Cervero & Radisch, 1996; Leck, 2006).

There are two sub-categories of development that fall under new urbanism: Transit-Oriented Development (TOD) and Traditional Neighbourhood Design (TND). Both are similar in that they share the core principles of new urbanism. How they differ is in the significance that is placed on certain design elements. For TOD, ensuring that residents are able to walk, cycle or use public transit as their primary mode of transportation is the principal objective underlying a development's design. On the other hand, TND emphasizes the connection between architectural and aesthetic qualities of a neighbourhood and the influence it has on creating social capital.

Together, the smart growth approach and new urbanism movement have gained many supporters in the development industry and influenced suburban development across North America. Many municipal governments across the U.S. and Canada have used a smart growth approach in their land use policies, and a number of TOD and TND suburban neighbourhoods have been developed in response to market demand. However, as researchers have conducted numerous studies to assess if these developments meet their design objectives to be a better alternative to conventional suburbs, the results have been mixed.

For instance, one of the underlying assumptions in New Urbanist designs is that mixed land use, particularly proximity between residential and commercial land uses, will increase walking frequencies in suburban developments. Most studies support this belief, with results showing that pedestrian activity is actually greater in neighbourhoods where commercial and residential uses are closer together. Studies by Handy (1992) and Cervero and Duncan (2003) reveal that mixed-use neighbourhoods contain a greater number of frequent walking trips and

more bicycling and walking to commercial areas than neighbourhoods with segregated uses. However, some studies have come to opposite conclusions. Research conducted by Crane and Crepeau (1998) found that both land use and street network design did not influence travel behaviour at all. Further, residents of the renowned Canadian new urbanist community of Cornell, Markham, have experienced the shortcomings of this expectation firsthand. After moving to the neighbourhood based on a promise of living in a walkable community, residents have been left frustrated at the gap between expectations and reality. As one resident noted, "I was drawn here by the novelty of the idea. But the goal of a walkable community with shops and a retail centre has not been achieved. We have to drive everywhere" (Carlson, 2009).

Nonetheless, even with mixed evidence, many argue that this alternative approach to developing the suburbs is still better than the conventional design. By consciously designing new suburban developments with sustainability in mind, planners and architects have shown that there is an alternative way to build neighbourhoods that can benefit the economy, the environment and the people all at the same time.

The Need to Retrofit

Though there have been a growing number of New Urbanist developments, one major criticism remains: the majority are built on greenfield land at the periphery of urban areas. As mentioned earlier, many negative effects are associated with developing on greenfield land, so building outside urbanised areas undermines the level of sustainability achieved by these new suburban communities. To truly become more sustainable, growth should occur primarily within already urbanised areas, including in the suburbs.

The idea to absorb growth in existing areas is not new, and is actually promoted by new urbanism in its guiding principles. The fourth principle related to regions in the Charter of the New Urbanism prepared by the Congress for the New Urbanism (1996) reads:

> Development patterns should not blur or eradicate the edges of the metropolis. Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric, while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion. ("The Region," para. 4)

Encouraging growth and renewal within existing built areas is also one of the 10 smart growth principles, as it would ensure investments in infrastructure are optimized and developments would not take up new land.

Most of the projects proposed to absorb growth within existing built areas have been located within central areas outside suburban communities. The few projects that were proposed for suburban areas predominantly focused on updating the existing multi-unit housing stock in many older, middle-ring suburbs across North America. Two major characteristics of suburban apartments made them attractive for retrofitting: their medium densities and their proximity to commercial areas. Planners and architects argued that since these characteristics were two conditions necessary for creating walkable suburban neighbourhoods, suburban apartments would be easier and less costly to retrofit. Simply adding basic pedestrian infrastructure could have a significant transformative influence (Hess, 2005).

However, recent events have brought the idea of retrofitting entire suburban areas to the forefront of planning issues. Due to a mortgage meltdown a record number of homes went into foreclosure across the U.S. in 2008, leaving a landscape of abandoned single-detached houses

and dead malls in many suburban areas. Although a similar level of crisis was avoided in Canada, the foreclosures prompted a fear of the suburbs becoming the new slums of the 21st century. The anticipated departure of the aging population, and a lack of demand for the houses that this population group will leave behind, is expected to place further stress on suburban neighbourhoods. In response, planners and architects across the continent have started to focus on how to retrofit existing suburban areas. Whether it is to recover a suburban neighbourhood from its abandoned status or to prevent the abandonment to take place at all, the intention is to retrofit these areas to appropriately meet current societal needs.

Research regarding the concept of retrofitting the existing suburbs remains limited due to the novelty of the topic. Indeed, though resources that discuss individual building retrofits have existed since the rise of the environmental movement in the 1970s, researchers have only recently begun to explore options regarding the retrofitting of suburban areas. Most of the research is centered on design solutions, such as increasing land use mix, adding active transportation infrastructure, and enhancing the public realm. However, discussions regarding process are beginning to appear as planners and architects attempt to bridge the gap between theory and practice.

In Canada, researchers and housing groups have been working to address the issue of retrofitting suburbs. The majority of research on the future of suburbs and the need to retrofit them has been conducted by the Groupe Interdisciplinaire de Recherche sur les Banlieues (GIRBa). The GIRBa is a research group affiliated with the Research Center in Planning and Development at Laval University in Quebec City, Quebec. Although the focus of the research centres on the aging suburbs of the Quebec City area, the GIRBa considers general questions regarding what approach to development is best for the future of conventional suburban

neighbourhoods, and what types of regulatory reform, planning ideas and design initiatives may have a positive impact on suburbs in a way that will also gain the support of neighbourhood residents (GIRBa, 2011).

One Canada-wide housing initiative that has been supporting alternative development options for suburbs is the Affordability and Choice Today (ACT) initiative. Created in 1990, ACT is funded by the Canada Mortgage and Housing Corporation (CMHC) and delivered by the Federation of Canadian Municipalities (FCM) to promote local-level solutions that overcome regulatory barriers to the development of affordable housing. ACT projects cover a number of topics, one of which is intensification, renewal and development. The projects under this category deal with revitalization and intensification within existing neighbourhoods in order to meet housing needs, such as laneway housing in Toronto and backyard infill housing in Montreal (ACT, 2011). Although its projects are not limited to suburban intensification, ACT still serves as an example of how housing initiatives may help planners interested in suburban retrofitting to find ways to change existing zoning regulations that not only provide greater housing options but increase density in existing neighbourhoods as well.

When considering how to retrofit existing suburban developments in the US, the current leaders in the discussion are Ellen Dunham-Jones and June Williamson, authors of *Retrofitting suburbia: Urban design solutions for redesigning suburbs*. Released in 2009, the book is the first major publication that has attempted to address this issue and serves as a guidebook of possible solutions for architects and planners. The authors state that one of the primary goals of retrofitting is to build and support identifiable and durable places that will attract people, and as a result the book emphasizes design-oriented solutions that predominantly focus on built form.

This emphasis is reflective of the authors' backgrounds: both are architecture professors and Dunham-Jones is a board member of the Congress for the New Urbanism.

The book instils a sense of urgency to address the issue of retrofitting through large-scale interventions. The authors discuss a wide range of examples – from retrofitting commercial strips and dead malls to retrofitting garden apartment complexes and residential subdivisions – and argue that the only way to successfully retrofit the suburbs is through large-scale projects. Though they agree small changes are good, the authors insist that "at a time when climate change and peak oil prices call for vast swaths of existing suburban areas to be retrofitted on a scale and at a speed that is beyond the capacity of incremental urbanism, it is worth recognizing when the kind of large-scale changes associated with 'instant cities' might be welcomed rather than shunned" (p. 2). They emphasize retrofitting at specific nodes and along corridors, and linking the large-scale retrofits into local networks and larger sustainable systems to contribute to healthier, polycentric metropolises. The underlying logic is that if solutions are sought on a large scale, there is a greater chance to achieve the critical mass necessary to encourage behavioural change and to initiate the evolution of the encompassing transportation, regulatory and market systems (p. viii).

However, as with other literature on retrofitting the suburbs, the book does not explicitly discuss how to implement these ideas. The only time implementation or process is mentioned is in the case studies that follow each chapter. These case studies discuss the steps that were taken by the public and private sectors to complete the retrofit project, but it would have been more useful if the chapters included general guidelines to implement similar retrofit projects in different contexts. A discussion about how public participation fits into the process would have

also improved the connection between theory and practice and made the book more useful to practitioners.

If *Retrofitting Suburbia* serves as a guidebook, then the book *Sprawl Repair Manual* by Galina Tachieva serves as the toolkit. Published in the fall of 2010, the latest book to address this issue provides the framework to design interventions, incorporate them into the existing regulatory system, and implement them using permitting strategies and financial incentives. Like Dunham-Jones, Tachieva is a New Urbanist, working as a partner and director of town planning at the central office of Duany Plater-Zyberk & Company. Though both focus on design-oriented solutions, *Sprawl Repair Manual* differs from *Retrofitting Suburbia* by emphasizing the effectiveness of choosing incremental improvement at a variety of scales – from the region to the community, street, block, and building – over fast, large-scale projects.

Tachieva reminds planners and architects that although certain areas of suburbs are more suited for retrofitting than others, the retrofitting process can take different paths depending on the local context. She argues that unlike the other two types of suburbs – the pre-war suburb and the exurb – it is the post-war suburb that is in the most need of repair and is best suited to be urbanized. Location and existing underused infrastructure are the two main characteristics that make post-war suburbs ideal for retrofitting. However, locational characteristics such as the regional context, ownership pattern, politics, economic potential and the availability of construction methods, technology, materials and workforce will determine the specifics of the retrofitting process.

The main strength of Tachieva's book is her emphasis on regulatory and implementation techniques that are useful in the retrofitting process. Providing what was lacking in Dunham-Jones' book, Tachieva discusses the need to change current zoning practices and to create

incentives for smart growth development. She specifically promotes the use of form-based codes that regulate the form of the built environment, but insists that whatever change is made should be conducted slowly, in parallel with or in place of existing codes. Easier permitting and infrastructure funding from public-private partnerships and government-funding programs are two main implementation techniques Tachieva suggests to materialize the proposed regulatory changes.

By suggesting the key to successful implementation is policy and zoning change, Tachieva echoes other researchers and proponents of suburban retrofitting. Though there is an acknowledgement and recognition of the need to change development patterns in many urban areas, policies that direct development within existing built areas are lacking. For instance, in one case study Edwards & Haines (2007) examined thirty comprehensive local plans in Wisconsin to assess whether the policies effectively promote their smart growth goals. They found that even though plans promoted infill development, there were very few policies regarding where to direct new development in existing areas or how to create incentives for developers. In these ways, existing zoning codes and land use policies prevent changes suggested by suburban retrofitting advocates. Therefore public officials must establish a regulatory framework that would promote and allow retrofitting developments. By working within this supportive framework, builders and developers can adapt to provide these new types of developments (Steuteville, 2011).

In recognition of the critical role of public support, Tachieva notes one of the most important implementation tools to ensure the success of retrofitting projects is marketing. She encourages developers, municipalities and public-private partnerships to hire a marketing team to design a program that emphasizes the image of a complete community that a retrofitting project

can bring to a conventional suburban development. The basis of the idea is that "by showing attractive options for repair, such programs educate the population and help developers and municipalities make the case for the mix of uses and higher densities needed in sprawl repair projects" (p. 60).

Other suburban retrofitting researchers go beyond marketing and suggest that a planning process that includes more public participation would enable public support for proposed retrofitting projects. The suggested level of public participation would be greater than the minimum level required in standard planning practice, and the participation process would be designed to encourage community acceptance by working with local residents to come up with solutions they can live with. As an example, this type of public participation was used in Richmond, British Columbia, when the municipality was considering a splitting process that would allow landowners to split their lots into two smaller lots, thus doubling local densities. Here, the municipality conducted household opinion surveys and held public meetings to discuss recommendations on lot-splitting before adopting the final policies (Clark, 2000). Researchers at the GIRBa have found that including a transdisciplinary approach, whereby people of different backgrounds of knowledge can come together and discuss design solutions, would enhance the planning process for retrofitting projects by educating the public and finding more publicly-accepted solutions as well (Despres, Brais, & Avellan, 2004).

Taken altogether, the existing literature on suburban retrofitting all point to a complete vision shared by retrofitting advocates of what existing suburbs will hopefully become after these retrofits: walkable, compact communities with mixed land uses and housing types that consume less open space and permit different modes of transportation. The characteristics of the future retrofitted suburb are purposefully chosen to reflect a landscape that is the complete

opposite of existing suburbs, with the underlying assumption that by incorporating certain built form and land use characteristics of urban neighbourhoods the benefits of urban life will carry over as well.

However, the actual influence of each of these characteristics is not as predictable as researchers suggest. Their complexities should be explored before they are advocated as 'solutions' to the problems of the suburbs. This is important for planners and architects who will have to communicate the need for these retrofits to the residents of existing suburban neighbourhoods. People have beliefs and perceptions related to physical characteristics of their surrounding environment, some of which are true while others are based on false information. If planners are not confident in explaining the reasons behind adding certain physical characteristics to an existing neighbourhood, they will be unable to correct misperceptions and face opposition.

Take for instance one of the most promising characteristics to alleviate the problems associated with the existing suburbs: density. The concept of a compact community with densities that are higher than those currently found in most suburbs is very attractive to planners and architects, and is one of the underlying themes in both retrofitting books discussed earlier. However, what exactly is a compact community? When researchers and practitioners discuss density, what definition are they using? Are the benefits they promote founded in evidence? If so, are they effectively communicating this to the public? The following chapter will examine these questions and attempt to demonstrate the challenge of understanding and communicating the concept of density.

II Density

Density is a term that planners and architects have used over many decades. The term evokes images of extremes: at one end is a compact city with tall buildings close together and at the other is a sprawling suburb with short buildings distributed throughout a large area of land. Its exact definition, however, is not as simple. The concept of density is cross-disciplinary and complex, and although density is often viewed by practitioners in terms of its implications on land use, building types and land consumption, its impact on people must be considered as well.

According to research conducted by Arza Churchman (1999), there are two main concepts that are used to define density and how it influences people. Both are important and demonstrate how density can be evaluated in a variety of ways by different people, under different circumstances, and in different cultures.

The first concept used to define density is *objective density*, which is defined as the relationship between a physical area and the number of household units or people who inhabit or use that area. The measurement of objective density can differ depending on the factor being manipulated. If a given number of people are within spaces of different sizes, then the measurement will be placing emphasis on objective spatial density. If different numbers of people are within a space of a given size, then the measurement will be placing emphasis on objective social density. Planners and architects primarily use objective density to define density since it is objective, quantitative and easy to communicate to the public. It is also a neutral way to describe density, without associating any evaluation as to whether it is positive or negative.

Churchman notes objective density measurements can vary and should be carefully used by practitioners. Different denominators and numerators may be used in the density formula, and a variety of land units may be used as the denominator. Definitions distinguishing between net and gross density may also vary, leading to further differences in measurement. If inconsistencies between measurement choices are not noted, comparing densities between different places, or even between different projects, will yield misrepresented results.

Further, although a quantitative method of measurement allows density to be communicated clearly to the public, the measurement is an average number which may not reflect the varying characteristics of an area. Developers may work with changes in lot size, site design and housing type to create a variety of built form combinations that produce the same objective density measurement within a given area (Canada Mortgage and Housing Corporation, 2011b). For instance, two areas of similar size may have the same quantified, objective density but may differ greatly in built environment characteristics, such as the ratio between open and built space or building heights. By only considering the objective density measurement, the built form of an area could be misrepresented.

The second concept used to define density is *perceived density*. Unlike objective density, perceived density is subjective and emphasizes an individual's perception and estimate of the number of people and available space in a given area. The numbers associated with the quantitative measurements of people in the space is not what is most important to an individual's perception of density; rather, it is the physical cues in the environment that represent people or activities that take place in that space. This can lead to misperceptions between the quantified objective density and the perceived density of a place. In the suburbs, this misperception is most

prevalent when high density figures are equated to high-rise buildings even though there is no necessary relationship between the two.

A well-known example of the influential power of perceived density is the concept of crowding. Crowding is a subjective evaluation by an individual that the objective and perceived densities of a given space are negative (Churchman, 1999). This perception has a major impact on the well-being of individuals, as those who evaluate density as being too high and define it as crowding experience harmful psychological stress. For instance, a study conducted by Moch, Bordas & Hermand (1996) found that the more crowded apartment residents felt, the more they were dissatisfied with their social interaction and the lower their sense of well-being. However, whether a person will define a certain density as crowding depends on their individual characteristics, situational variables and coping strategies. This makes it difficult to predict whether someone will evaluate a certain density as crowding.

Ultimately, the difference between objective and perceived density is one that can make a large difference to the people who will inhabit and live near areas where suburban retrofitting will occur. Recognizing the difference between objective and perceived density is especially useful to practitioners when addressing the prevailing deep-seated, North American negative attitude towards density in residential areas.

Negative Public Perception of Density

The prevailing negative public perception of density in residential areas dates back over a century. During the industrial era, living in the city was undesirable. Dirt, crime, disease and poverty were abundant, and a high concentration of land use mix brought manufacturing, commercial and residential land uses uncomfortably close together. Crowding was a problem and was attributed to many of the negative consequences experienced by urban residents. Indeed,

by overlaying physical and social characteristics of a neighbourhood onto a map, early studies looking at explanations for diseases, crime and violence interpreted population density as a causal factor (Lawrence, 2002). It was in this environment that the first residential multi-storey building arose, and the undesirable qualities attributed to crowding in the city became associated with high-rise living. In the meantime, the wealthy upper class moved out of the city to live in the countryside where it was more spacious and healthier, and thus developed the first low-density suburbs. This pattern of development continued and by the early 20th century, the social norm saw the single family home as the only appropriate dwelling to nurture family life. The apartment was believed to foster immoral behaviour and was thus an inappropriate housing choice for families (Hess, 2005).

The negative perception of high-density residential development was reinforced further by municipal zoning and regulation. Advocates of government regulation promoted the belief that multifamily housing was 'evil' and should be excluded from single-family neighbourhoods to protect the home (Fischler, 1998). Thus, in 1916, the introduction of zoning in the U.S. led to the very first exclusive single-family residential zone in Berkley, California, as well as a New York zoning code that secured suburban conditions by regulating lot coverage and building height. By 1926 the negative attitude toward apartment dwellings was so prevalent that the U.S. Supreme Court referred to an apartment within a neighbourhood of private dwellings "as a 'parasite' that could destroy the 'residential character of the neighbourhood'" (Hess, 2005, p. 31). Neighbourhood concept plans of the time reflected this negative perception as well. In most cases the housing types would not be mixed, and if they were, the apartments would be placed along the edge of the neighbourhood. This is exemplified in Clarence Perry's 1929

neighbourhood unit, where the single-family house defines the neighbourhood while apartment buildings are left outside along arterial roads.

Ultimately, the regulations themselves gave legal basis to the belief that different types of housing were equated with differences in social characteristics as well (Fischler, 1998). By the time Levittown was developed in the 1940s, the association between single-family detached dwellings and family life was solidified into suburban North American culture. The social values of homeownership, consumerism and conformity attributed to the post-war suburbs collectively strengthened the idea that the low-density suburb was a better alternative to the high-density city. Every time a post-war suburb was developed this association was reinforced, and as a result the negative attitude towards density continues to exist.

A look into recent infill projects to intensify existing residential areas reveals how this negative perception prevails. Newspapers constantly report disputes between residents and developers concerning the density of proposed projects in existing suburban neighbourhoods. For instance, in one suburb of Toronto a resident distributed a petition letter opposing a proposed high rise apartment project by telling area residents it "will reduce your property values and wreak havoc on your quality of life with all kinds of negative implications for traffic congestion, health, safety, crime, loss of privacy, light and noise pollution and shading, and hospital and school overcrowding" (Zeppieri, 2011).

It is likely that people's negative perception of density is based on perceptions of high social density rather than spatial density. When a proposed project is perceived to add a greater number of people to a neighbourhood, people tend to associate this increase in population with crowding and its negative impacts. Indeed, the literature on crowding suggests a link between a building's habitable floor area per person and a number of negative health consequences for

residents (Lawrence, 2002). Social consequences of high social density include less liking for others, withdrawal from interaction, aggression and low pro-social behaviour (Bell, Greene, Fisher, & Baum, 2001b) . The type of people the project will bring is a concern as well: it is a common stereotype among the general public that high-density buildings equate to affordable or low-income housing. Thus, people believe high-density projects will bring people who do not fit in with the socioeconomic status of neighbourhood residents, even though it is often the case that people of all income groups choose to live in higher-density housing (Haughey, 2005).

However, when projects are identified as high-density development, it is not social density but rather spatial density that is being discussed. A building may be high in overall spatial density and yet low in social density, thus making it unlikely to have the negative impacts associated with high social density. Still, most residents immediately react negatively to a proposed high-rise building. This is also why Moch, Bordas & Hermand (1996) found feelings of overcrowding mentioned the most in the tallest high-rise building in their study, even when the density was similar to that of neighbouring, shorter high-rise buildings.

Many researchers have noted that it is the basic fact that a project is different from its existing surroundings that drives the negative perception of density in residential suburban areas. In fact, the difference need not be related to density; if the project is different, residents will perceive it negatively. Evidence of people's negative perception toward projects that are different from their surrounding neighbourhood can also be found back in the early 20th century. Blackmailers would capitalize on this negative perception by purchasing land in good neighbourhoods with no private covenants and threatening to build undesirable buildings that would decrease local values. To stop them, neighbours would have to pay the blackmailers large sums of money (Fischler, 1998).

The interpretation that resistance to change is at the base of negative perceptions of density was examined in a study by Curic & Bunting (2006). The researchers focused on the process of a residential infill project in an inner suburb of Toronto, and identified the most immediate obstacle to housing intensification in built-up areas as public resistance to change. To make matters more complicated, there were differences when the researchers attempted to address how residents defined a 'compatible' new project. Most residents understood a 'compatible' project as one that was 'same as' its surroundings, but other residents saw compatibility in terms of the project's property value impact on a community or whether the project could co-exist with what is already there. Indeed, people are willing to accept density and intensification under certain conditions (Churchman, 1999).

Whatever the underlying reasons, this negative perception of density continues to prevail, and it is worth questioning whether the associated concerns are valid. Suburban retrofitting literature emphasizes density as beneficial to attaining a sustainable built environment. However, research has questioned the overall benefits of density, and these studies are often overlooked in discussions about sustainable development.

The Truth about Density

Though density is an important characteristic of retrofitting suburban projects, some researchers have discovered density does have its disadvantages. Regarding high-density in the form of high-rise buildings, a recent article by Mehaffy (2011) analyzed current research findings and concluded that there are drawbacks to tall buildings, and that the density of a project alone does not determine whether it is sustainable. Rather, the other physical characteristics of a project, such as the efficient placement of people and activities, and its relation to its surroundings in terms of contributing to land use mix and accessibility are the factors that

determine whether it is sustainable. This places in question the impact that density may have on suburban retrofitting projects in low-density residential areas. To stress this point Mehaffy (2011) refers to a recent UK House of Commons report which concluded:

> The proposition that tall buildings are necessary to prevent suburban sprawl is impossible to sustain. They do not necessarily achieve higher densities than mid or low-rise development and in some cases are a less-efficient use of space than alternatives. (para. 7)

Indeed, Mehaffy finds that the benefits of density are not linear, and that past a certain point – approximately 50 people per acre – the negative effects begin to outnumber the positive effects.

The negative impacts of density are related to the tall buildings themselves and the impact on the adjoining properties. According to Mehaffy, the negative effects of tall buildings include: higher embodied energy of steel and concrete per floor area with increasing height; higher heat gain and loss as a result of higher exterior exposure to wind and sun; diseconomies of vertical construction systems and the resulting higher cost per usable area; and the psychological effects on residents, especially families with children. The impact of tall buildings on adjoining properties include heat island effects, ground wind effects, social effects due to 'vertical gated community' syndrome, and psychological effects for pedestrians and residents.

Researchers have also examined whether there is validity behind the benefits which have been historically linked to higher density and have led to its status as a sustainable alternative. For instance, a recent study by Forsyth, Oakes, Schmitz and Hearst (2007) found that there is no relationship between density levels and overall walking or physical activity, even though increased density is commonly associated with a greater amount of walking and physical activity. The only association they found was between higher density and a greater amount of utilitarian walking, but they stress it is only a modest association. Similarly, when considering

the existing literature, they found that when previous studies found significant effects of higher density on walkability these effects were small as well. Adding to the questionable validity of studies examining the relationship between higher density and walkability is the fact that most were limited by confounding variables, such as land use mix, distance, and sociodemographic characteristics, which are also important factors that influence the level of walkability. The researchers concluded that when considering a range of environments that vary by density within an area, environmental modifications in density present a zero-sum game: though high-density environments encourage utilitarian walking and low-density environments encourage leisure walking, the overall levels of physical activity and walking across all environments do not change.

Another benefit often associated with densification in suburban areas is higher quality of life. Breheny (1996) mentions that researchers who favour concentrated, centralized urban development argue decentralisation will destroy quality of life, and that with diversity, high urban densities provide a rich urban life. With higher density, opportunities for social interaction are produced, allowing for a greater sense of community (Glynn, 1981). However, other studies have found that such high density neighbourhoods lead to a low sense of community and quality of life, while others have found no connection between density and sense of community at all (Freeman, 2001; Wilson & Baldassare, 1996).

Further complicating matters is how perceptions of the benefits of density influence the development of density policies, resulting in misperceptions about what density policies can actually achieve. Researchers of a recent study published by the Neptis Foundation closely examined density and density policies within the GGH and found that density policies should be changed in a number of ways in order to produce its desired results (Taylor & van Nostrand,

2008). For instance, current density policies have overlooked the impact of changing household sizes on the number of dwelling units required to achieve the desired density levels in certain areas. If household sizes are shrinking, then more dwelling units would be required to house the same number of people, resulting in lower population densities. Further, if household sizes shrink within existing built areas, these neighbourhoods will have a lower population density in the future, which will undermine the efficiency of current infrastructure investment and service provisions. To address this problem, the researchers suggested that density policies should overshoot their density targets in anticipation of the expected decline of future population density.

Though evidence exists that density does not necessarily lead to promised positive benefits, there is little evidence that confirms beliefs associated with the negative public perception of density. In many cases, researchers have found the opposite of the belief to be true. Take for instance the belief that higher-density projects in existing residential neighbourhoods will lower property values. When Curic & Bunting (2006) examined the impact of a higher-density infill project in an existing low-density suburb, they found the new project did not impact neighbouring property values even though residents were initially afraid the project would devalue their property. In fact, the new infill project turned out to have higher values than the existing houses. The addition of intensification projects in low-density residential areas also increase the tax revenue for the municipality and thus reduce the tax burden on existing residents (Newberg, 2011).

If there is a mismatch between beliefs stemming from negative perception of density and actual effect of density, could there be any hope for planners to help correct the misperceptions? Some researchers predict that the current economic recession will encourage people to change

their minds about density and shift to a more urban way of living, even though they still prefer low-density communities (Rybczynski, 2011). However, rather than having people feel they are forced to change their beliefs, it is best to address the negative attitude toward density head-on by informing residents about the actual effects of density.

Addressing Negative Perceptions of Density

Studies that have examined intensification have identified strategies that may aid planners in addressing the negative public perception of density during the planning process. One approach is for architects and planners to work on the site design of a project to address neighbourhood compatibility concerns and change attitudes toward higher-density buildings. In one study, Larco (2009) examined the use of site design in changing perceptions toward multifamily housing in suburban areas. By changing the site design of multifamily housing projects from the traditional, isolating design to a more open design meant to increase its connectivity with surrounding commercial and residential areas, planners and architects were able to help dispel biases against multifamily housing by showing how this type of housing could successfully fit into existing suburban neighbourhoods.

Another important tool suggested by the literature is visualization. When describing a new intensification project to residents of an existing suburban neighbourhood, words and numbers only go so far in communicating what the proposed increase in density will look like. Thus, visualizations help by giving the public an idea of what to expect. The form-based codes promoted by New Urbanists would be useful in this regard. Planners may also use models, photos and other visuals in their public meetings to stimulate discussion. As one San Francisco architect who has achieved success in getting California communities to accept higher densities noted, “It really has a lot to do with showing people lots of examples – photos, drawings, plans.

You can't talk in abstractions. You have to say, here's what this thing can look like, here's how it can work" (Knack, 2002, p. 8).

Ultimately, education that directly addresses the negative public perception of density is one of the most effective strategies discussed in the literature. Educating the public about the current problems facing suburban neighbourhoods, the options for how to retrofit to meet future needs, and how density plays a role in this process is crucial to gain public support for suburban retrofitting projects. When discussing density, planners should ensure the public understands how different levels of density may be physically realized within a neighbourhood. For instance, California's Local Government Commission paired images that showed different types of housing at different densities to educate residents during a public meeting (Knack, 2002). Further, planners must move away from the technical definition of density and educate the public about the benefits of density in creating complete neighbourhoods. As another practitioner noted, planners should "get away from X units per acre and get to a definition that will resonate with people: 'At this [density] level we can support this . . . or that" (Knack, 2002, p. 9).

A few studies have identified the problems that have arisen when planners have not addressed public concerns regarding density. One example is shown in a study examining residential intensification of surplus hydro lands in suburban neighbourhoods in Toronto. Curic and Bunting (2006) observed that planners did not get the message across to residents regarding why certain types of urban form needed to be developed in the established suburban neighbourhoods. As a result, the resident opposition to infill projects remained. This residential opposition intimidated developers who found it too risky to do the infill development, and when developers attempted to propose projects they chose designs of lower density than they would like to build. The researchers suggested that a lack of education from the planners may have also

resulted in the politicians being unable to make the hard decisions to appropriately zone the areas for intensification. As other examples of this kind exist, it is evidently worthwhile for planners to communicate with the public to alleviate fears and correct misperceptions about density and intensification.

The next chapter will present the case study of Markham Centre, a large-scale intensification project within an existing low-density area. So far it has been considered a success by both residents and the municipality. Have intensification policies helped to change perceptions of density among the public? If negative attitudes toward density still prevail, how have planners managed to address public concerns regarding density to produce a positive outlook? Interviews with key informants from the region, the municipality and the local citizen population provide a glimpse into the process.

III Case study

The case study in this chapter will focus on Markham Centre in Markham, Ontario. The first section will describe Markham and its fight against sprawling conventional suburban development. The second section will discuss provincial, regional and municipal policy framework put in place to support intensification in response to the problems caused by conventional suburban development well beyond Markham's boundaries and into the Greater Toronto Area (GTA) and the Greater Golden Horseshoe (GGH). The third section will describe Markham Centre and the plans for bringing higher densities into the surrounding low-density neighbourhood. Finally, the last section will provide the results of the interviews with key informants.

Markham, Ontario

Markham is a Canadian suburban municipality located north of the City of Toronto, and is one of nine municipalities within the Region of York [**Fig. 1**]. According to the 2006 Census by Statistics Canada (2007), Markham's population of approximately 260,000 is primarily comprised of visible minorities, who make up for 65% of the total population and are primarily of Chinese and South Asian background. Most of the Markham population is made up of households containing a couple (married or common-law) with children, and approximately 30% of the population has achieved an education at the university level with a certificate, diploma or degree. People in occupations in business, finance and administration as well as sales and service make up the greatest proportions of Markham's labour force. Further, Markham is considered

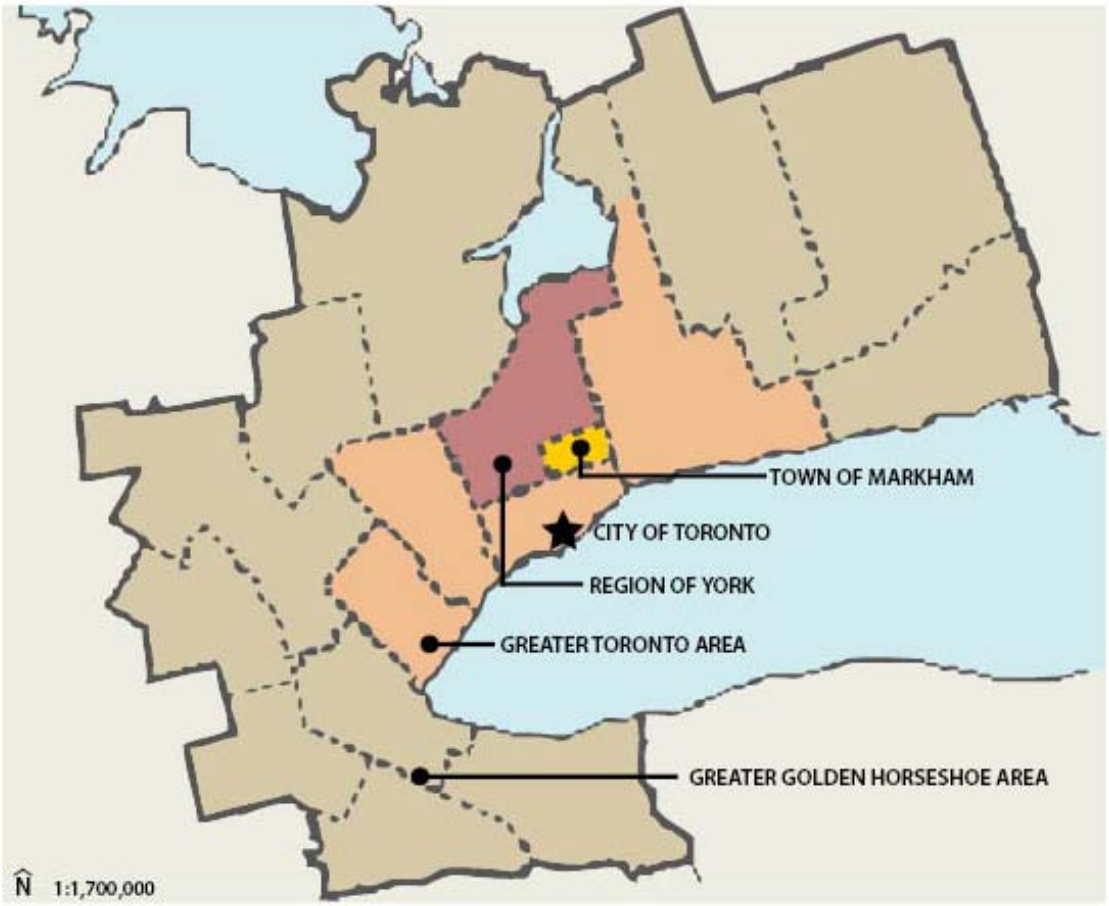

Figure 1: Geographic context. *The Town of Markham is located within the Region of York, which is one of many regions that make up the Greater Toronto Area. The Greater Toronto Area forms the core of the Greater Golden Horseshoe Area.*

Canada's high-tech capital with over 800 high-tech and life science companies located within its boundaries (Town of Markham, 2004).

Markham's built environment has established the town as yet another suburb in a North American metropolitan area. Though it contains two villages that date back to the 1700s, Markham's main phase of development and growth into a municipality came after World War II when the development of highways led to post-war suburban development. As a result of decades of this type of development, Markham's landscape consists of strip malls lining arterial roads and low-density residential development on cul-de-sacs, a majority (67%) of which consist of single-detached houses (Statistics Canada, 2007) [**Fig. 2**]. With the majority of the population

commuting by private vehicle as a driver (74%) and working in a different census division (56%), Markham's landscape also reinforces the typical suburban image where the distance between homes and daily destinations are far greater than in the inner suburbs or the central city (Canada Mortgage and Housing Corporation, 2011a; Statistics Canada, 2007).

As a result of its conventional suburban built form, Markham has suffered negative consequences shared by other suburbs, especially through the loss of prime agricultural land. This process is ongoing: the Town of Markham's 2009 agricultural assessment reports that the number of farms in the municipality dropped from 85 to 64 between 2001 and 2006. This accounted for a 42.5% loss in land area being farmed, which decreased from 28,437 acres to 16,352 acres within the same time period (Town of Markham, 2009). The continued loss of agricultural land has triggered a strong response from the public to put an end to sprawling growth.

In fact, the public response to the loss of agricultural land in Markham tends to involve debates concerning whether density and intensification are appropriate alternatives for development. This is most evident in a recent controversial debate about an issue that took place in 2009. The debate was sparked by the coinciding release of Markham's agricultural assessment and the Region of York's proposal for Markham to expand its growth boundary into agricultural land. One side fought to protect the Markham foodbelt and halt future expansions to the urban growth boundary, noting the low-density development provided an ample amount of land to intensify in existing areas to meet future housing needs. The other side did not want a freeze on the growth boundary, and often used language that expressed a fear of intensification in their campaign projects. One website called "Save Our Markham" (2011) included a statement that intensification would result in road congestion, changes in property values, the loss of

Figure 2: Markham's landscape. *Markham's landscape predominantly consists of low-density residential housing, but it also contains a historic village, agricultural land, and a couple of high-rise residential buildings. (Source: Personal collection).*

community form and overcrowding in schools and recreational facilities. The website also contained a section entitled "High-Rise Troubles" with a list of newspaper articles reporting crimes taking place in or near apartment buildings. Eventually, after many public meetings, council voted against the freeze on the urban growth boundary in May 2010.

Markham is not alone in the battle against conventional suburban development. Markham and a few of its neighbouring municipalities within the Region of York – Richmond Hill, Aurora, Newmarket, and Vaughan – are among the fastest-growing suburban municipalities in Canada, having increased the region's population by 22.41% between 2001 and 2006. According

to recent population projections, the Region of York will continue to grow, adding 740,000 people and 390,000 jobs in the next 20 years, doubling the region's 2001 population and employment base (Tomalty et al., 2007). The bulk of this growth is expected to be absorbed by Vaughan, Richmond Hill, and Markham. However, as these municipalities are already the most developed within the region, there is a pressing need to accept denser, alternative forms of development to accommodate the anticipated population and employment increase.

Neighbouring municipalities are beginning to make an effort to contain growth through intensification. One such municipality is Richmond Hill, which is located directly northwest of Markham. Although Richmond Hill has the benefit of being centered on Yonge Street, a corridor traditionally flanked by high-density buildings, it is still primarily characterized by a low-density landscape made up of single-detached dwellings and strip malls. As a result, the town conducted a housing intensification study as part of the Markham Official Plan review in 2009 to identify opportunities for intensification in existing areas and to create an intensification policy framework. The rationale to intensify Richmond Hill was similar to those of other municipalities: to accommodate projected population growth, reduce automobile dependency, provide a range of housing choice, and "create vibrant, compact, and complete communities, which utilize resources and infrastructure efficiently" (Town of Richmond Hill, 2009). The study went a step further to emphasize the importance of urban design in ensuring that the intensification process is successful and that the intensification projects integrate within the existing community.

Fortunately, Markham remains at an advantage compared to its neighbouring municipalities in the struggle against sprawling growth due to its long-term history with intensifying development. This is most evident when comparing Markham to Vaughan, a neighbouring suburban municipality in the Region of York. Both are relatively newer

municipalities compared to their counterparts within the region, and both have similar population and land area measurements. They are also the same distance away from the City of Toronto. Yet Vaughan has only 71% of the density found in Markham, with approximately 873 people per square km as opposed to 1,231 people per square km (Statistics Canada, 2007). The difference in building characteristics between the two municipalities plays a role. Although single-detached dwellings make up the greatest proportion of housing in both areas, Vaughan has a lower percentage of row houses and apartments than Markham.

Policy Framework

In recent years, Markham and its neighbouring suburban municipalities have benefitted from overarching legislation from the Region of York and the Province of Ontario that promotes intensification and prevents sprawling growth. The multi-level policy framework that supports intensification within existing built areas began as a response to problems caused by conventional suburban development across the GTA and GGH. With a population of 5.5 million people, the GTA is Canada's largest metropolitan area and largest employment centre, especially in the manufacturing and service industries. As a result it attracts many new immigrants from abroad. The City of Toronto absorbs most of the new immigrant population, containing 52.4% of all immigrants across the GTA and 20% of all immigrants across Canada (City of Toronto, 2011). In fact, the City of Toronto alone is considered one of the most multicultural cities in the world, with over 140 languages and dialects spoken within its borders.

The continuous flow of new immigrants has led the GTA to grow and expand to meet the associated demand for housing. As with other North American metropolitan areas, this growth has primarily taken place on the periphery of the City of Toronto and within the surrounding regional municipalities in the form of conventional suburban development. Unfortunately, the

GTA shares another similarity with other metropolitan areas in that it is facing a number of problems as a result of relying on this pattern of development.

One of the most urgent issues currently facing the GTA is traffic. In 2007, the GTA ranked as the fourth-most congested area on the continent, with commute times taking 32% longer than in free-flowing conditions. The time commuters spend sitting in traffic rather than working costs the GTA approximately $2.2 billion each year (Government of Ontario, 2007). The economic impact is not the only consequence of congestion in the GTA. This congestion has led to health concerns over increasing rates of obesity as people spend more time in their cars, as well as environmental concerns regarding the amount of carbon dioxide emissions this traffic is producing. Aside from lack of efficient public transit options, a large part of the problem is the single-use zoning of the suburban areas which separate working areas from residential areas. As a recent report found, the greatest contributor to congestion in the GTA is the 66 million sq. ft. of highway-dependent office space located in the suburban municipalities (Canadian Urban Institute, 2011).

Unfortunately, the growth challenges facing the GTA extend past its borders and into the GGH. The GGH is home to 25% of Canada's population and one of the fastest growing regions in North America (Ministry of Public Infrastructure Renewal, 2006). However, most of this growth has followed a sprawling pattern. A recent study found that between 1991 and 2001 the GGH sprawled as its rate of urban land area expansion exceeded its rate of population growth. Approximately 56% of this urban growth was in the form of greenfield development while only 44% was in the form of intensification within built areas (Taylor, Burchfield, Moldofsky, & Ashley, 2010). As the GTA and other municipalities within the GGH continue to grow, it is projected that the population of this region will grow by 3.7 million people to a total of 11.5

million people between 2005 and 2031 (Ministry of Public Infrastructure Renewal, 2006). Without proper management and planning, most of this population growth would continue to be accommodated in the form of conventional suburban development. The result would perpetuate the challenges the region already faces as a result of this type of development: the addition of more automobiles on the road; the conversion of valuable and needed employment lands into residential uses; the development of more infrastructure to service low-density areas; the degradation of the natural environment and water resources; and the consumption of prime agricultural land valuable to the region's future economy (Ministry of Public Infrastructure Renewal, 2006).

Provincial Policy Framework

Anticipating the challenges ahead if the typical pattern of growth did not change, the Government of Ontario created an ambitious planning framework to effectively guide future growth across the province. In March 2005, the province issued the Provincial Policy Statement (PPS) to set the policy foundation for ensuring the appropriate development and use of land in Ontario (Ministry of Municipal Affairs and Housing, 2005b). The PPS centres on the overall vision of an Ontario with strong communities, a healthy environment, and a strong economy through policies which direct growth within settlement areas and away from areas with sensitive resources, while promoting efficient development of land through a mix of housing, employment, parks and transportation choices. The policies support intensification and redevelopment by proposing designated growth areas with compact form and a mix of land uses. Density is promoted to support the availability of public transit in order to reduce the future amount of trips by automobile.

The PPS was followed by the Places to Grow Act, which came into effect in June 2005 and gave Ontario the authority to designate growth areas and develop growth plans for the province (Government of Ontario, 2011). With the Places to Grow Act, the province can use an integrated approach to coordinate growth across municipal boundaries while ensuring municipalities and communities across the province continue to grow in a sustainable way. The Act gives priority to any growth plan produced by the province, and forces all local Official Plans to bring their plans into conformity within three years of a growth plan being issued.

Backed by the PPS and the Places to Grow Act, the Government of Ontario issued two significant plans to direct and manage growth in the GGH. The first was the Greenbelt Plan, issued in 2005 under the Greenbelt Act. This plan identifies land that should not be developed to permanently protect prime agricultural land and environmentally sensitive areas including the Oak Ridges Moraine (Ministry of Municipal Affairs and Housing, 2005a). This moraine is an important natural area that is home to different animal species, many of which are threatened species that are rare or do not exist in other parts of Southern Ontario. Further, the Oak Ridges Moraine provides fresh water through rivers and streams to communities throughout Southern Ontario, and provides clean drinking water for approximately 250,000 through its groundwater supply (Ministry of Municipal Affairs and Housing, 2000). With the risk of losing the moraine to conventional suburban development as the GGH continues to grow, the Greenbelt Plan was an essential plan to protect the province's vision of a sustainable future.

The second significant plan developed by the province was the Growth Plan for the Greater Golden Horseshoe. Issued in 2006, the Growth Plan follows the vision set out in the PPS and Places to Grow Act and provides a plan to guide development within the GGH to ensure sustainable growth to 2031. It complements the Greenbelt Plan by ensuring the careful planning

and efficient use of land that is not protected by the Greenbelt Plan in order to accommodate the forecasted population growth in the area. Overall, the Growth Plan promotes building "complete communities", which are urban or rural communities "that are well-designed, offer transportation choices, accommodate people at all stages of life and have the right mix of housing, a good range of jobs, and easy access to stores and services to meet daily needs" (Ministry of Public Infrastructure Renewal, 2006, p. 12). It provides policies to manage growth to ensure economic, social and environmental prosperity, with regulations for transportation, infrastructure, land use, urban form, housing, natural heritage and resource protection.

Most importantly, the Growth Plan promotes intensification within existing built-up areas to justify the additional transit and infrastructure investments needed to accommodate future growth. The general intensification policies in section 2.2.3 of the plan state that by the year 2015 and for each year afterward, a minimum of 40 per cent of residential development will be within the built-up area. Municipalities are given the task to update their official plans and supporting documents to provide the strategy and detailed policies needed to achieve this intensification target at the local level.

One way the Growth Plan encourages intensification within built areas is through the development of Urban Growth Centres (UGCs). Designed to complement intensification corridors, major transit station areas, brownfield sites and greyfields, UGCs are regional focal points that accommodate people and jobs in a setting that provides cultural facilities, public institutions and transit services. Their geographic locations are identified on a map in the Growth Plan, but the plan leaves the exact size and boundaries to be determined in consultation with the municipalities. Each UGC must achieve a minimum gross density target of residents and jobs combined per hectare by 2031 or earlier. The minimum gross density targets are predetermined

by the geographical location of the UGCs, and range from 400 residents and jobs combined per hectare for UGCs in the City of Toronto to 150 residents and jobs combined per hectare in municipalities on the periphery of the GGH. Markham Centre is among the group of mid-range UGCs with a minimum gross density target of 200 residents and jobs combined per hectare.

Regional & Municipal Policy Framework

What sets Markham Centre apart from most other UGCs in the Growth Plan is that it was already envisioned by the Town of Markham and Region of York by the early 1990s. At this time Markham was already beginning to experiment with alternative forms of suburban development, and the Region of York was establishing a Centres and Corridors structure for the region's updated Official Plan to promote intensification within the built area. In 1994, the new Region of York Official Plan was issued and it included the vision for a Centres and Corridors structure which identified Markham Centre as one of four regional centres to intensify in order to absorb the majority of future growth. The Markham Centre Vision document was brought forward by the town, and the Markham Centre Secondary Plan (OPA #21) was adopted by town council in 1994 and approved by the Ontario Municipal board in 1997. By the time the provincial Growth Plan was issued in 2006, the Region of York and Town of Markham were already a decade ahead in planning work and well underway in the development of detailed plans and policies to implement the vision for Markham Centre.

Markham Centre UGC

Markham Centre covers approximately 400 hectares of land, and is bound by Highway 7 to the north, Kennedy Road to the east, Highway 407 to the south, and Roddick Road to the west [**Fig. 3**]. The area includes a portion of the Rouge River Valley system, which provides the main

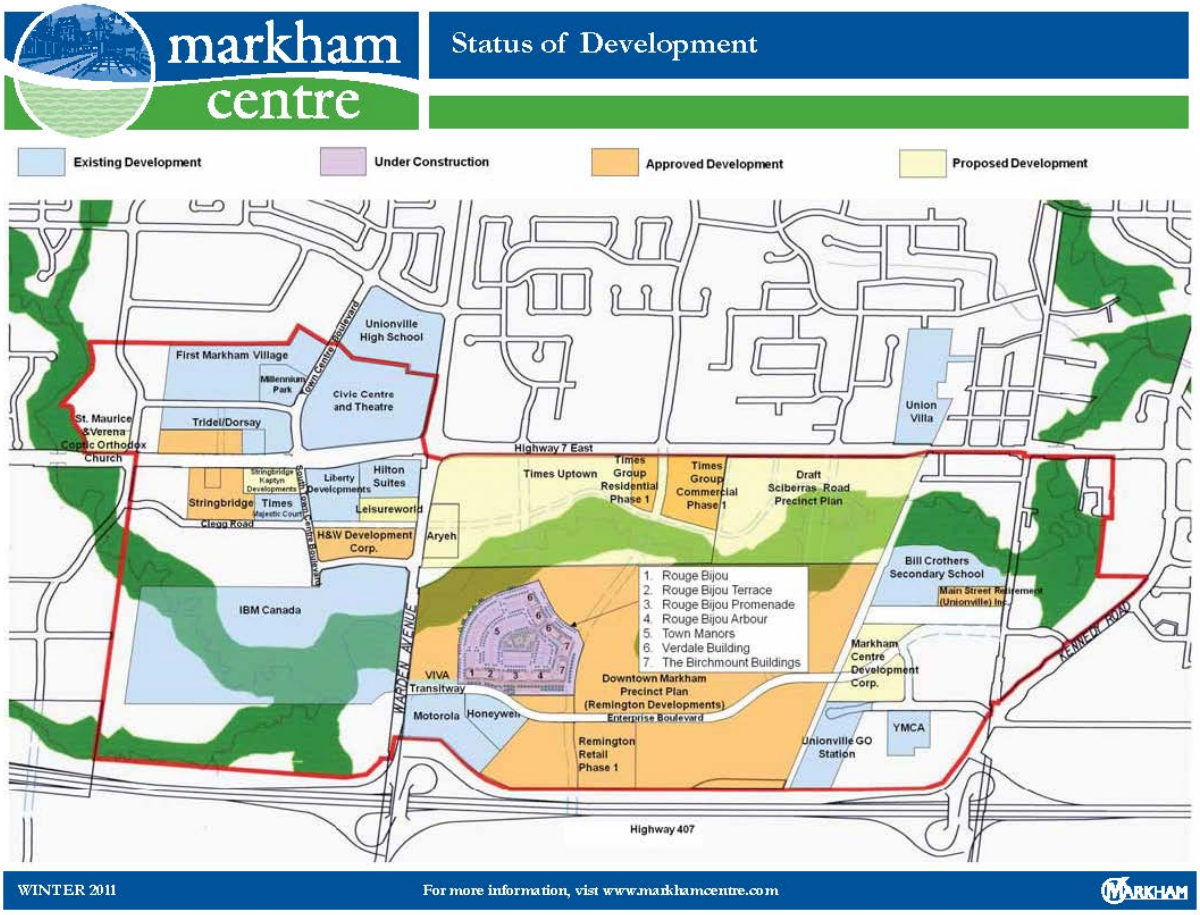

Figure 3: Markham Centre map. *The red line delineates the boundaries of Markham Centre. This map shows that as of Winter 2011 the majority of projects within Markham Centre already exist or have been approved. (Source: Town of Markham, 2011c).*

open space for Markham Centre and leaves approximately 300 hectares of developable land (Town of Markham, 2011b).

The main purpose of Markham Centre is to provide a dense, compact, mixed-use and transit-supported town centre where people can live, work and play. In 1994, the Town of Markham hired New Urbanist Andres Duany to prepare a conceptual plan for Markham Centre. Echoing many of the New Urban principles espoused by the movement and the current suburban retrofitting literature, the plan provided a low- to mid-rise development with 8- to 13-storey buildings at the upper end of the range that complemented the adjacent heritage and residential areas and was accepted by residents of Unionville, the closest established neighbourhood

(Unionville Ratepayers Association, 2008). The conceptual plan followed the targets set out by the Markham Centre Secondary Plan, which originally identified land use targets to include 25,000 residents in 10,000 residential units and 17,000 office jobs.

Over the past two decades the plans for Markham Centre have evolved. Regional and provincial regulations have been updated to reflect revised population forecasts and new transit projects, and plans for Markham Centre have been adjusted to comply with these changes. In 2002, the Markham Centre Advisory Group was created to assist the Town of Markham in setting the principles and objectives of the updated Markham Centre Plan and in developing the performance and implementation measures for Markham Centre. The Advisory Group is made up of 20 members and includes interest groups, residents, business owners, and local area stakeholders to provide a well-rounded representation of public input.

Detailed plans for Markham Centre are divided into precinct plans prepared by the landowners of individual districts. They follow 11 official guiding principles set out by the Town of Markham and the public in the early 1990s to ensure Markham Centre is built to respect the original vision [**See Appendix**]. The precinct plans provide details regarding land use, building heights, density, and the physical character of the built environment in the relevant district. The plans must follow LEED standards, and each development application must be reviewed according to the Markham Centre performance measures created by the Markham Centre Advisory Group and Town of Markham staff in order to ensure the design conforms to the overall planning vision.

As of 2011, many precinct plans have been approved and the details regarding Markham Centre's physical structure are becoming more apparent. Markham Centre will contain office buildings, commercial space, and mid- to high-rise residential buildings with four new schools

Figure 4: Markham Centre's landscape. *A number of high-rise residential buildings and rowhouses have already been built and occupied as construction continues in the western district (Source: Personal collection).*

and 30 hectares of parkland interspersed throughout the area. It will cover existing institutional and cultural buildings located on the west side, such as Markham Civic Centre, Markham Theatre, Unionville High School and the Hilton Suites. As of 2011, there are discussions among councillors and town staff to provide additional sports, entertainment and cultural facilities in a designated section of Markham Centre under the name 'Markham Live'. An extensive transportation plan will allow Markham Centre to be accessible to the rest of Markham and the GTA through rapid bus transit, regional rail and cross-highway tramline connections to provide non-automobile transport options and reduce the traffic impact of the project on the existing

surrounding communities (Town of Markham, 2011b). Construction is already well underway in the western district of Markham Centre, and many office buildings are already occupied while approximately 4,000 residential units are occupied or under construction (Town of Markham, 2011b) [**Fig. 4**].

Most importantly, the latest plans reveal higher densities and greater intensification than what was originally proposed. Markham's recent Growth Management Strategy states that the land use targets for Markham Centre are currently set to include 41,000 residents in 20,000 units, and 39,000 jobs as opposed to the 25,000 residents in 10,000 residential units and 17,000 office jobs set in the original plan. In response, developers are proposing office and residential buildings with heights ranging from 8 to 39 storeys instead of the 8 to 13 storeys initially envisioned. Staff and councillors behind the Markham Live project have even proposed a residential/office tower with a height of 50 storeys. This substantial increase in density from the original plan has led Markham Centre to have density targets that exceed those set out in the Growth Plan with approximately 267 residents and jobs combined per hectare of developable land (Town of Markham, 2011b).

Interviews with Local Stakeholders

The results of the interviews are divided into three parts to answer the three specific research questions.

Is there a difference between how professionals and the public perceive density?

At first, almost all respondents defined density in an objective and quantitative way. Floor Space Index was one objective definition used by the regional planner and one of the developers. The most common answer was the definition found in the Growth Plan, which defines density as the number of jobs and residents per hectare. This answer was shared among

the planners from the Town of Markham and the Region of York, the citizen representative of the Unionville Ratepayers Association, and one of the developers. Many of the respondents noted that they were aware of the different ways to define density objectively. For instance, the Markham planner went a step further by explaining why this objective definition was used for the Growth Plan, noting that housing units per hectare would not be an appropriate measurement for density in a mixed-use environment since employment units do not exist. If density was defined by housing units only, then the quantified density would not reflect the true density of the area. For one respondent, a Markham councillor, the fact there were different ways to define density prompted him to note that "the definition is difficult to say."

When the respondents elaborated on their initial objective definitions, they revealed different perceptions of density. To the developer, density was not about the number of people but rather about the size and type of building and its relation to the site in order to generate revenue. For the Markham councillor, density was all about the number of people required to justify infrastructure investment and was therefore best located around key transit hubs to support the development of connected transit routes. The regional planner was aware of these differences, stating, "Density could mean different things to different people. You can measure it differently, and also the perception of what density looks like can be different."

One common understanding among most respondents was that density was just one piece of a larger whole that makes an integrated and complete community. The planner and councillor working at the Town of Markham and the two anonymous local professional respondents all noted that density could not be considered alone, and that it was its connection to other physical characteristics of the built environment that made it important. To exemplify this point, the Markham councillor described how density works with a good public realm, transit and a mix of

land uses to create a better place for people. For the regional planner, density was regarded as an important element in intensification efforts, but it was equally as important as other intensification components such as land use, design, environmental sustainability, and building character. The developers were the only respondents who did not say anything regarding the role of density in relation to other factors that make an integrated community.

Regarding public perceptions of density, all of the respondents acknowledged that the dominant attitude is negative. Whereas the professionals appear to focus on the positive connections between density and other physical characteristics that make better places, the general public emphasizes the connections to negative consequences. The main concerns heard by the respondents were related to increasing traffic, demands on infrastructure and amenities, diminishing property values and the impact on neighbourhood character. According to the anonymous local resident, some residents were worried that the condos would be bought by investors and rented out "to transient people who won't set down roots in the community." The Unionville Ratepayers Association (URA) representative summed up the overall attitude by saying, "I think the general public just thinks of it [density] as crowding or overcrowding." As the regional planner noted, since people don't have good examples of density to point to, they tend to have negative images in their mind.

To exemplify the prevalent negative perception toward density, a few respondents noted the public response to recent intensification development applications in the area. One example was a 5-storey building proposed to be built within a predominantly 2-storey residential neighbourhood. People who attended the public meeting held objections regarding the proposed height and the resulting traffic the building would generate. As the URA representative noted, it was "too much too close." Another example was one of the new Markham Centre projects that

would be across the street from the same neighbourhood. Again, the URA representative explained that "traffic was a big concern, and also the impact on the existing neighbourhood." The public response prompted the developer to go to the OMB, and a compromise was reached to push the towers toward the interior of the development and away from the existing neighbourhood.

Some respondents attributed this negative perception of density to a general negative attitude toward change. The URA representatives said, "Generally people are a bit concerned and worried about change. Those that live there and like their world as it always has been see [the need to intensify] as threatening." This was reiterated by one of the developers who said, "It boils down to what they perceive to be the impact of new development. It doesn't even have to be higher density development." Residents will evaluate change in terms of the impact it will have on them, and as the Markham councillor noted, when "they can see what they're afraid of is not that bad . . . then this fear goes away."

However, according to the respondents, the general public appears to accept density under certain conditions. One acceptable condition is when the location of the additional density is regarded as appropriate in relation to the overall built form of the neighbourhood. Regarding the 5-storey building recently proposed in the area, one of the anonymous local professional respondents acknowledged that the concerns expressed by the residents were valid in this case since the proposed density was not appropriate in this context. The Markham planner noted that this reaction was stronger than the response seen regarding Markham Centre because the proposed building is located within the existing neighbourhood so it is seen as a dramatic change. The Markham councillor noted that people want a transition from density to single-family housing, rather than have a sharp contrast in the built form of the neighbourhood.

Another condition under which residents appear to accept density is when other public interventions are in place in anticipation of new projects to diminish fears of the negative impact. This is particularly the case for the fear related to the impact the density will have on traffic. One of the anonymous local professional respondents said that residents say that they don't want intensification until problems related to traffic are solved. A similar comment came from both the URA representative and the anonymous local resident, who noted that if the supportive transit keeps up with the intensification then people will be more accepting of the increasing density.

Do perceptions change if policies are in place for higher density development in suburban areas?

According to most of the respondents, public perceptions do change when policies are put in place to support higher-density development within existing low-density areas. Despite the negative perception of density that still prevails among the public, the URA representative noted that Markham's history of intensification has made the negative perception and opposition less intense than in communities where intensification is brand-new territory. As the anonymous local resident noted, "Very rarely do I now hear the saying, 'I moved here to get away from the city and look what's happening,' or 'If I wanted to live in a dense city I'd go back to Scarborough.' We used to hear that a lot more." This resident added that enough information was provided regarding the need to curb sprawl that people have "grudgingly accepted it." The Markham planner noted that there were changes in the perception of density for developers as well. Over time, developers became more involved with making denser developments, whereas earlier they were not as enthusiastic.

Most respondents agreed that by the time the Growth Plan and density-supportive policy from the province came into place, the public perception toward density was already better. The regional planner pointed out how the Region of York's history of encouraging intensification made a difference regarding public perception toward density compared to other regions in the GGH, noting, "The Growth Plan was seen as a natural evolution. It really wasn't anything new, certainly to Markham or York Region. We had the structure. We welcomed it."

The respondents found that the supportive policy did not change perceptions on its own, but rather through how the professionals working at the Town used it. Many respondents mentioned that having an overarching policy supporting density and intensification helped to justify proposals with a higher density to the public and push plans for intensification forward. The anonymous local resident noted that the planners "aren't communicating the benefits or the negatives [of density], they're just providing context and saying 'This is the law. We have no choice but to do this.'" The Markham planner said that the Growth Plan also reinforced a fixed urban boundary that made it easier to encourage developers to look at opportunities within the built area.

The developers, however, were the only respondents who saw things differently. Both believed that public perceptions of density have not changed even with supportive policies in place. One of the developers noted that perceptions have not changed since the Growth Plan was introduced "because the average person doesn't know it exists." She explained that most public meetings regarding intensification policies have a low turnout, and residents will only know about it if it is clear it will personally impact them. The other developer reiterated the point, stating that he saw no difference in reactions from people after policies supporting density were

put in place. He said that despite the existing policies, "NIMBYism is still there . . . it doesn't matter at all."

What strategies can planners use to overcome public misperceptions of density?

According to the respondents, planners and professionals working at the Town have kept an ongoing dialogue with the public in a variety of ways. For development throughout the town, they have held the standard public meetings required each time a new policy or project is proposed. For development in Markham Centre, they have gone a step further by creating the Markham Centre Advisory Board and providing a Markham Centre website that contains newsletters and development status updates. Staff also held open-house sessions and workshops to keep residents informed about what would be happening. The anonymous local resident noted that in these meetings the planners "just provide facts, and don't provide the negatives or benefits [of new development]."

To communicate information about density and intensification to the public, planners have moved away from numbers and focused on visualizations. The regional planner explained:

> Everyone understands that intensification is important and what it means, but what it looks like is the other part of the puzzle. So as early as 2000/2001, we started a series of visualizations for our centres and corridors. Starting with photos of an area as they exist today and then taking them [the public] through, saying, 'As we move towards intensification, this is what an area could look like, and this is how it can transition' so people can get an idea of how a street unfolds and how density fills in. Then they have a context for a number, and what notions of high density may mean in reality. I think it was really well received and it helped dispel a lot of myths.

Figure 5: Density education. *A slide from a presentation about height and density options that was presented to Markham councillors (Source: Town of Markham, 2007).*

The Markham councillor and planner noted that planners at the Town also educated the councillors about intensification since they have to represent the public voice and make decisions on development proposals. Markham planners gave councillors an education session on intensification and density, which showed how height and density are related yet distinct by providing examples of what certain densities might look like [**Fig. 5**]. The councillors were also taken on a bus tour to view different examples of existing intensification projects around the GTA. The Markham planner noted that he saw a change in the perception of density among councillors following these education sessions.

If questions concerning density arose during these public meetings, most respondents did their best to provide residents with an explanation that addressed their concern. One of the developers noted that if the concerns related to a project's density were valid, and not arising from a NIMBY attitude, then they were able to address the concerns in a constructive way. As the other developer noted, sometimes they would address specific resident concerns about density by providing detailed visuals that showed the shadowing and general urban design of a project to help demonstrate to the residents that the proposal would not have a negative impact on them. However, if it was a NIMBY attitude and the person did not listen to the explanation, then all the developers could do was take note of their comment. The York and Markham planners reiterated this point, and said that they did their best to explain to people so they understood, but ultimately they could never please everybody. As the anonymous local resident said of the planners, "If there is an error of facts they'd step up . . . they would stay silent if it's just an opinion."

Based on their experiences, the respondents listed a few key strategies they believed planners could use to effectively communicate the benefits of intensification and increasing density. First, planners should strive to create an open dialogue with the public through ongoing communication that goes past public meetings. For this reason the Markham Centre Advisory Board was acknowledged to have played a large role in changing public perceptions related to density. Many respondents agreed that an important way Markham ensured density perceptions were addressed was by involving the resident associations in the planning process. The regional planner noted that Markham's communication with residents right from the beginning has made a noticeable difference in reactions to density compared to other municipalities, because "you

have a public that has quite a bit of education under their belt in a sense that the town has been engaging with them for a long time."

Second, planners should actively educate the public about density and what it means. As the regional planner noted:

> I think we have a responsibility to engage with the public. If we expect them to have ideas and to consult with us then we have to arm them with the right information and the right frame of reference for that dialogue.

One of the developers agreed, stating that education makes a big difference and that the onus was on the planners to bring forward information that is easy to understand. She pointed out that planners must explain how density helps the community as a whole, noting that "the more you can share with people about how a community works and move them past the 'it's going to impact me' thought, the more they will understand and accept."

When educating the public, planners should use the connections residents perceive between density and negative attributes to direct their education. For instance, regarding a general fear of who will move into the higher-density projects, planners can educate residents about how these higher-density options could in fact provide a home for their loved ones. As one of the developers noted, in this case it is useful to explain to the public that "providing smaller housing options means that when their daughter or son moves out they have a place to move out [to], or if their parents need to move into something different, then they can stay within their community." When negative perceptions depend on fears related to traffic, educating people about connections between density and traffic infrastructure investments – if they exist – would increase acceptance of density. As the Markham councillor said, "If they can see [density] is starting to solve some of the things they need, I think you have a chance." One of the local

professional respondents said planners could even use the NIMBY attitude to their advantage when proposing an intensification project. The respondent elaborated that planners should ask, " 'If you don't want to see any development there, do you want to see development in your backyard?' [laughter] Of course they will say, 'No, no, no! Okay, put it there!'"

Third, planners should present information about density through visualizations. One of the developers stressed that numbers do not work because people do not know what that means physically. Councillors may benefit from the use of visualizations as well, with the Markham councillor stating, "What planning does a lot of times is put out a 100-200 page report and you're supposed to visualize it. Show what you mean to get us buying into the vision and then driving it." Planners should provide visual information that puts projects, plans and regulations in the context of the existing area and displays how they will be part of the bigger picture. The URA representative noted that doing so "gives you a good sense of where there's height and how close that is on encroaching your neighbourhood." A few respondents also stressed the effectiveness of providing visual examples of how buildings of different densities compare to suburban, single-family neighbourhoods and how urban design could help minimize physical differences. Visualizations of the building design and style was noted as an important factor for the public as well.

Ultimately, whether or not planners can successfully overcome the negative public perception of density appears to depend on having an active and motivated citizen base that is willing to learn and participate. As one of the developers stated, the response depends on the audience since a lot of people will not listen even if you provide them with an explanation regarding their concerns about density. Local residents appear to have the motivation to learn, and have sometimes taken responsibility to educate themselves. The anonymous local resident

noted that a year earlier the URA set up an information session about the basics of transportation theory to educate local residents, and by the end of the session residents were providing positive feedback about how much they learned. To get information from the Town, the URA representative described how the association would approach the politicians to get the staff and planners to hold a session. He summarized their efforts, saying, “We’ve brought in people, we’ve brought in the Town, we’ve listened to lots of presentations to try to help the community to better understand not only what is happening but why it’s happening.”

IV Analysis & conclusion

Today's conventional suburban development was born in the post-war automobile age to serve the needs of society at the time. More than half a century later, suburbs continue to be built in this way. However, what has changed is that conventional suburbs are now built with the awareness that they come along with many negative consequences: social problems related to obesity and neighbourhood cohesion; economic problems related to loss of productivity; and environmental problems related to the loss of agricultural land and the use of the automobile as the primary mode of transportation. The Smart Growth and New Urbanism movements brought awareness of alternatives, but to completely avoid greenfield development – the main cause of sprawl – there is growing recognition that the suburbs must be intensified by building within existing areas. For this reason, a suburban retrofitting movement has begun to emerge.

However, as one of the proposed solutions in the suburban retrofitting literature, promoting density and intensification is not as straightforward as it seems. Based on the case study of Markham Centre, it is clear that different people perceive density differently. Though there is a common understanding that an objective, quantitative definition exists, which calculates density by dividing a certain number of people or housing units by a certain area, what matters most is that there are differences in perceptions of density. What these differences suggest is that the professionals and the public are turning to different underlying beliefs about density, and evaluating density based on indicators related to these beliefs. The resulting attitudes toward density are therefore based on different interpretations of facts and information.

The professionals who were interviewed held the general belief that density is a physical element of the built environment that serves as a stepping stone to attaining other desired results. For the councillors and planners, density is just one element in a group of sustainable physical characteristics that projects should contain in order for Markham to move away from sprawl and toward more sustainable development. It does so by adding the sufficient amount of people required by an area to justify other public infrastructure and service investments, most notably public transit. Indicators related to residential units and employment spaces, and how many people they will add to a neighbourhood, are used to evaluate and form the basis of perceptions related to the density of a proposed project. The closer the projected population of a proposed project is to the number required to justify new infrastructure and services, the more likely the planners and councillors will positively perceive the density of a project.

For the developers, density is believed to be one of many physical characteristics of a project that acts as a source of revenue. Density is not seen in the larger context of the community, but is rather seen as a factor in a larger equation that makes a project profitable. The gross floor area, the type of building and the building's relation to the project site are the indicators the developers used to evaluate density. The more profitable density appears to make a project, the more favourable the perception of density.

This is not to say that professionals never perceive density negatively. For planners and councillors, the location and design of a proposed high-density project is important in determining whether the density is perceived positively or negatively in accordance with its surrounding neighbourhood. If a proposed high-density project takes the form of a high-rise located directly next to low-rise buildings, the density of the project will likely be perceived negatively due to the lack of transition between the two built form types. Further, for developers,

higher density can be inefficient and perceived negatively when the financial costs outweigh the potential revenue. If density is to be perceived positively by developers, it must make financial sense.

On the other hand, based on the answers from the respondents, the public held the general belief that density is a physical element of the built environment that leads to crowding. What is particular about this belief is that it is derived from the same information shared with planners and councillors; that density adds a certain number of people to a given area. However, since the belief is different, the public uses indicators of crowding to evaluate levels of density. Unlike the councillors and planners who only focus on the number of people, the public looks at personal indicators – traffic impact, demand on infrastructure, impact on property value, and compatibility with the existing neighbourhood – to evaluate density. The more personal indicators are impacted, the more likely the public has a negative perception of density.

However, there is hope to change the negative public perception of density. As emphasized by the suburban retrofitting literature, policymakers should change zoning and regulations to support intensification in existing areas. Providing an overarching policy framework will give developers the security of knowing the intensification projects they propose are supported by policy, and will provide planners the legislative backing needed to persuade members of the council and public to support such projects. According to the case study performed here, these overarching policies not only help to push intensification plans forward, but also help to change public attitudes toward density.

Changing the public's negative perception of density is a key component in making sure that high-density projects receive community support, thus having intensification-supportive policies removes a potential barrier during the planning process. By implementing mandatory

regulation, the public is faced with no other option than to accept the incoming changes in density. If planners communicate the benefits of density and justify the policy changes, residents will be more accepting of intensification projects through the new supporting policies. Over time, successful projects developed under the new regulations will exemplify the positive benefits of density and diminish the public fear of change, leading to more positive public perceptions of density. This process whereby supportive policies have led to more positive attitudes toward density appears to have occurred with residents in Markham.

Developers can also contribute to changing the negative public perception of density. It is already standard practice for developers to use renderings and drawings of proposed projects during public meetings. However, when proposing an intensification project, developers should strive to use visualizations of the proposed project at different geographic scales: a small-scale visualization at the building level; a medium-scale visualization at the immediate area level; and a large-scale visualization at the neighbourhood level. This will ensure the visualizations will represent how the project will fit in the existing neighbourhood, which touches on the personal indicators used by the public when formulating their attitudes toward density. Developers should arrive at public meetings prepared with data and information about how the project may impact existing properties and residents to address concerns that arise during the meetings as well.

The building and site design plays a large role in perceptions of density, and thus architects and urban designers have significant roles to play in making sure perceptions of density are positive. As the density literature suggests, high-density does not always equal high-rise, and thus the design of a building can work around public fears of certain types of buildings that may be deemed undesirable within existing neighbourhoods. Ensuring that the building and site design respect the immediate context by providing a transition will minimize the public's

belief of personal impact and enable a more positive attitude toward density. The landscaping of the site should be considered along with the building's materials, respect for existing view corridors, and overall shape in order to ensure the higher density respects the existing neighbourhood and complements the overall neighbourhood quality.

For planners, the case study confirms that the strategies and tools suggested by the literature could be used to effectively address public concerns about density. The main strategies include: maintaining an ongoing, open dialogue with community members; educating community members about density and its connections to positive benefits; and using visualizations to allow people to see what density could look like with proper urban design. As the existing literature on density suggests, the public perceptions are often unfounded and thus it is worthwhile for planners to focus on dispelling the underlying beliefs in a clear and direct way. Communication should go beyond public meetings; part of the praise the Town of Markham has received for Markham Centre is its ongoing effort to reach out to the public through workshops, newsletters, a website and even an advisory board that took a transdisciplinary approach by bringing different stakeholders altogether. By addressing concerns about density through a variety of means, planners may even help build public confidence and trust that could feed into greater public support for intensification projects, as appears to be the case for the URA. The same strategies should also be used with councillors, as the approval of projects ultimately comes down to their vote.

The role of the public in changing perceptions of density should not be overlooked. In the case study, the existence of the URA helped residents connect with the Town of Markham and have a voice during the planning process. Although it is nearly impossible for every neighbourhood to organize themselves in the same way, residents who are interested in

development and are educated about current planning issues should still make an effort to keep neighbours informed. This was the case with the executive URA members, who did their part to educate themselves and inform neighbours about Markham Centre and the impact it would have on their neighbourhood. If planners create a more open, ongoing dialogue with residents and build trust and confidence, it may motivate residents to become more involved as well. In this way, the strategies suggested to planners for addressing public perceptions of density could create a positive cycle whereby negative perceptions of density may diminish as residents become more motivated to learn.

Further research is needed to examine density and the role it plays in suburban retrofitting. There is mixed evidence concerning many of the reported benefits and consequences of density, and as a result more studies are required to establish a reliable list of facts about density. If research can confirm the benefits of density, planners may have more confidence in educating the public and councillors, and density policies can be more precise to achieve specific goals. Researchers must also examine how to address negative perceptions of density as it will be one of the major barriers planners and architects will encounter as they plan and develop intensification projects. Collaborations between researchers in environmental psychology, policy, architecture, and urban planning may produce more informative results, and may even produce innovative strategies and tools that planners may use to address negative public perceptions of density in the suburban retrofitting process.

The purpose of this study was to show, by example, what could happen if overarching legislation to support intensification is put in place on multiple levels, as suggested by suburban retrofitting literature. It was also meant to demonstrate what strategies and tools planners could use to address prevailing negative public perceptions about density. The case study of Markham

Centre presents an example that has been in the works for about 20 years and it still has many more years ahead before it is complete. As more intensification projects appear as the suburban retrofitting movement unfolds, it will be of interest to planners and architects to address perceptions of density to overcome this potential barrier to the success of suburban retrofitting projects.

Appendix

The Markham Centre Vision is based on 11 Guiding Principles (Town of Markham, 2011a):

1. Protect and Enhance the Rouge River Valley
2. Support Public Transit
3. Transform Highway 7 into an Urban Boulevard
4. Develop an Effective Street Network
5. Provide a “Sense of Place”
6. Enhance Pedestrian Activity
7. Ensure Ecological Sustainability
8. Provide Cultural and Social Focus
9. Manage Traffic and Parking Issues
10. Deliver a Financial Framework
11. Respect Quality of Life in Markham

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List of Interviews

Anonymous Local Professional 1 – April 27, 2011 – In-person interview

Anonymous Local Professional 2 – May 3, 2011 – In-person interview

Anonymous Local Resident – April 27, 2011 – In-person interview

Developer – Fred Darvish – June 6, 2011 – Telephone interview

Developer – Niomie Massey – April 28, 2011 – In-person interview

Markham Councillor – Jim Jones – April 23, 2011 – In-person interview

Markham Planner – April 27, 2011 – In-person interview

Unionville Ratepayers Association Representative – Harry Eaglesham – April 26, 2011 – In-person interview

York Region Planner – April 28, 2011 – In-person interview