

**Creating Healthy Communities  
Through Urban Form**

by

Deirdre M. Liptay

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## **ABSTRACT**

The manner in which we design and build our communities can affect our physical and mental health. When we think about urban planning, we reflect on the form and arrangement of community, of urban, city and town planning. Urban form looks at the integration of land use and explores a complex range of the built and social environment: the environment, infrastructure, people, form and economics. The research recognizes cultural behaviours and activity patterns that affect air quality and environmental conditions; a lack of physical activity, community cohesion, highlights safety issues, and places individuals at risk for health illness.

The research evaluates the built form of the neighbourhood community and asks ‘What are the attributes of a healthy community’? The research will verify the extent to which the neighbourhoods selected in the study replicate these attributes and focus on how these neighbourhoods could be improved from a ‘healthy city’ perspective. Key urban form features related to healthy communities focus on the relationship between land use mix, network connectivity and street design, site design, and density. Sustainable planning of communities and efficient land use planning are relevant to healthy communities with the trend towards increasing population density.

While the research reinforces the connection between built form and public health planning, it also provides future direction for urban form policy; with improvements towards street connectivity, non-motorized transportation, expansion of regional trail and cycle networks, increasing transit access, encouraging mixed land use and greater land density to shorten travel distances. The research provides a basis for future studies in Canadian growth policy and healthy neighbourhood form, with significance as a Southwestern Ontario study.

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# TABLE OF CONTENTS

<b>LIST OF TABLES.....</b>	<b>vii</b>
<b>LIST OF MAPS .....</b>	<b>viii</b>
<b>LIST OF FIGURES.....</b>	<b>ix</b>
<b>GLOSSARY.....</b>	<b>xi</b>

## CHAPTERS

### 1. INTRODUCTION AND OVERVIEW

1.1 Research Question, Objectives, Theoretical Framework.....	1
1.2 Topic Interest.....	4
1.3 Geographical Context.....	4
1.4 Structure of the Thesis.....	7

### 2. LITERATURE REVIEW

2.1 Overview .....	9
2.2 The Healthy Community Concept.....	10
2.3 What the Healthy Neighbourhood Community Looks Like .....	12
2.3.1 Walkable Neighbourhoods.....	13
2.3.2 Variety in the Neighbourhood.....	14
2.3.3 Neighbourhood Sense of Place.....	14
2.3.4 Conservation.....	15
2.3.5 Connectivity .....	16
2.3.6 Transit Supportive .....	17
2.3.7 Safety.....	18
2.3.8 Balance and Livability.....	19
2.4 Smart Growth Model.....	22
2.5 Land Use Mix and Density.....	25
2.6 Network Connectivity and Street Design.....	29
2.7 Site Design and Green Infrastructure .....	37
2.8 Relationship between Community Health and Urban Form .....	40
2.9 The Land Use Planning Policy Context: Regional and Municipal .....	45
2.10 Public Health Reports: Fisher (2005), McCormick (2006), Schumilas (2007).....	50
2.11 The Economics of Urban Form.....	54
2.12 Comparative Ontario Municipalities, Urban Form Community Guidelines.....	58
2.13 Key Findings and Conclusions: Literature and Existing Policy.....	73

### 3. RESEARCH METHODS

3.1 Research Question and Research Design .....	78
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3.2	Benefits and Disadvantages of Quantitative and Qualitative Research .....	80
3.2.1	The Quantitative Approach .....	80
3.2.2	The Qualitative Approach .....	80
3.3	Pros and Cons of Specific Research Methods Used.....	82
3.3.1	Observation .....	82
3.3.2	Key Informant Interviews .....	84
3.3.3	Key Informant Questionnaire.....	88

**4. OBSERVATION, KEY INFORMANT INTERVIEWS AND KEY INFORMANT QUESTIONNAIRE**

4.1	Healthy Neighbourhood Urban Form.....	91
4.2	Neighbourhood Study Overview and Public Health Reports Published.....	92
4.3	Neighbourhood Study Evaluation, Region of Waterloo .....	95
4.3.1	Clair Hills, Waterloo .....	95
4.3.2	Mary Allen Uptown, Waterloo.....	100
4.3.3	Westvale Meadows, Waterloo.....	105
4.3.4	Shades Mills, Cambridge .....	109
4.3.5	Central Park, Cambridge .....	113
4.3.6	Country Hills West, Kitchener .....	117
4.3.7	Civic Central Frederick, Kitchener .....	120
4.3.8	Laurentian West, Kitchener.....	125

**5. ANALYSIS**

5.1	Key Research Findings, Comparative Public Health Reports and Literature Context .....	130
5.2	Study Findings Relevant to Existing Land Use and Policy Context.....	143

**6. CONCLUSION AND RECOMMENDATIONS**

6.1	Findings Relevant to Planning Practice.....	147
6.2	Findings Relevant to Planning Practice in the Regional Municipality of Waterloo .....	148
6.3	Findings Relevant to Planning in the Research Study Neighbourhoods.....	151
6.4	Reflections on the Research Experience .....	155

<b>REFERENCES</b> .....	156
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**APPENDICES**

Recruitment Consent Letter.....	171
Recruitment Consent Form .....	173
Recruitment Interview Questionnaire I and II.....	174
Feedback, Thank You Letter to Participants .....	179

## LIST OF TABLES

Table 1	Ontario Population and Growth, 2001-2006.....	5
Table 2	OMA Health Effect Estimates with Air Pollution .....	41
Table 3	Walking Rates .....	51
Table 4	Travel Patterns.....	51
Table 5	Comparative Municipal Urban Form Community Guidelines.....	70
Table 6	Research Key Findings Chart.....	135

## LIST OF MAPS

Map 1	Statistical Area Classification Map 2006.....	6
Map 2	Healthy Neighbourhood Urban Form .....	21
Map 3	Ontario Greater Golden Horseshoe.....	24
Map 4	Grid Street Pattern Map, Centre Core .....	31
Map 5	Cul-de-sac Map, Suburban.....	31
Map 6	Fused Grid System .....	32
Map 7	Transit Oriented Development.....	36
Map 8	An Overview of Neighbourhoods in Waterloo Region .....	94
Map 9	Clair Lake Environmental Assessment .....	97
Map 10	GIS Map, Clair Hills, Waterloo .....	98
Map 11	Uptown Waterloo Intensification.....	102
Map 12	GIS Map, Mary Allen, Central Uptown Waterloo, Waterloo.....	104
Map 13	GIS Map, Westvale Meadows, Waterloo.....	108
Map 14	GIS Map, Shades Mills, Cambridge .....	112
Map 15	GIS Map, Central Park, Cambridge.....	116
Map 16	GIS Map, Country Hills West, Kitchener .....	119
Map 17	GIS Map, Central Frederick/Civic Centre, Kitchener.....	124
Map 18	GIS Map, Laurentian West, Kitchener.....	129



## LIST OF FIGURES

Figure 1	Complex Set of Factors that Affect Urban Form.....	1
Figure 2	Waterloo Region Long-Term Population Growth, 5-year Intervals.....	5
Figure 3	Cross Walk, Country Hills.....	13
Figure 4	Walkable Trail, Mary Allen.....	13
Figure 5	Park, Mary Allen.....	14
Figure 6	Community Focal Point.....	14
Figure 7	Streetscape Quality, Westvale.....	15
Figure 8	Gateway Features, Focal Point.....	15
Figure 9	Natural Resource, Cambridge.....	16
Figure 10	Cultural Heritage, Central Park.....	16
Figure 11	Street Connectivity.....	17
Figure 12	Laurentian West.....	17
Figure 13	Uptown Waterloo Transit.....	18
Figure 14	Speed Hump, Shades Mills.....	19
Figure 15	One Way, Mary Allen.....	19
Figure 16	Visualizing Density Study: Core Area Comparisons.....	27
Figure 17	2008 Urban Density, Uptown Waterloo.....	28
Figure 18	Future Urban Density, Uptown Waterloo.....	28
Figure 19	Density: Suburban Study Area Comparisons.....	29
Figure 20	Standard Right of Way Street.....	33
Figure 21	Mixed Street Frontage.....	34
Figure 22	Streetscape, Kitchener.....	35
Figure 23	Streetscape, Waterloo.....	35
Figure 24	Green Infrastructure.....	38
Figure 25	Site Design, Cambridge.....	38
Figure 26	Ontario Nitrogen Oxide Emissions by Sector.....	42
Figure 27	Cycle Trail.....	43
Figure 28	Walking Route, Kitchener.....	43
Figure 29	Key Roundabout Features.....	43
Figure 30	Street Network Roundabout.....	60
Figure 31	Park Form.....	60
Figure 32	Streetscape.....	62
Figure 33	Pier Development.....	62
Figure 34	Barrier Free Median.....	63
Figure 35	Park Scape.....	63
Figure 36	Transit Supportive High Density Development.....	64
Figure 37	Protective Park Space Design.....	65
Figure 38	Pedestrian Streetscape Elements.....	65
Figure 39	Wide-shallow Lots and Tree Park Frontage.....	67
Figure 40	Gateway Features with Plantings.....	67
Figure 41	Front yard House Streetscape.....	67
Figure 42	Curb Extensions and Safe Crossings.....	69
Figure 43	High Density Streetscape.....	69
Figure 44	Street Median Design.....	99

Figure 45 Modern Gateway, Clair Hills..... 99

Figure 46 Right of Way, Mary Allen ..... 101

Figure 47 Older Uptown Park ..... 101

Figure 48 Streetscape, Westvale ..... 107

Figure 49 Fenced Walled Pathway..... 107

Figure 50 Suburban Sidewalk ..... 111

Figure 51 Streetscape, Shades Mills..... 111

Figure 52 Central Park, Cambridge..... 114

Figure 53 Central Park Market..... 114

Figure 54 Older Suburban Road..... 118

Figure 55 Bus Transit Stop..... 118

Figure 56 Intersection, Civic Central ..... 123

Figure 57 Street Light, Kitchener..... 123

Figure 58 Intersection, Laurentian ..... 127

Figure 59 Laurentian West..... 127

## GLOSSARY

<b>Urban Design Term</b>	<b>Definition</b>
<b>Aesthetics</b>	Qualities that contribute to the attractiveness or appeal of a place, such as the design of buildings (size and orientation of windows), landscaping, lighting and benches, intangible of the design features, more often described than measured.
<b>Auto Dependence</b>	Users of a transportation system who choose to make the automobile their primary mode of traveling. These users do not create or seek other opportunities to use other modes.
<b>Bus Rapid Transit (BRT)</b>	To develop rapid transit with rail-like characteristics such as dedicated rights of way, frequent, fast, reliable service. Uses bus loops and express buses and can operate in the street with mixed traffic.
<b>Central Transit Corridor (CTC)</b>	Approximate 40 km corridor of land designated for future transit service linking one end of the Region of Waterloo to the other.
<b>Countryside Line</b>	Defined hard edge growth boundary that provides clear boundary between urban and rural areas throughout the Region of Waterloo
<b>Density</b>	The amount of activity found in an area, defined as population, employment or building square footage per unit of area and measured as people per acre or jobs per square mile. Floor area ration, the ratio between the floor space in a building or the size of the parcel on which the building sits.
<b>Development Charges</b>	Levied by the Region (and lower-tier governments and schools boards) to cover growth related capital costs associated with new development (or redevelopment). These charges are levied for mandated programs (i.e. transit) where the funds collected have to be used to pay for the infrastructure made necessary by the development.
<b>Greater Toronto Area (GTA)</b>	The GTA is the largest urban region in Canada and one of the fastest growing areas in North America. The geographic area of the GTA includes the City of Toronto and the Regions of Halton, Peel, York and Durham.
<b>Greenfield Development</b>	New urban development on lands on which the previous primary activities included farming, aggregate extraction, or forestry.
<b>Greyfields</b>	Abandoned, obsolete, or underutilized properties i.e. regional shopping malls that are economically and physically ripe for major transit-oriented, mixed use redevelopment. Introduces new life and infill development in blighted commercial spaces.

<b>Growth Management</b>	Seeks to maintain an ongoing equilibrium between development and conservation, between forms of development and provisions of infrastructure, between the demands for public services generated by growth and the supply of revenues to finance those demands, and between progress and equity.
<b>Infrastructure</b>	With urban development, infrastructure refers to all bulk and general engineering services such as water supply, solid waste disposal, sewage, stormwater management, electricity supply and recycling management.
<b>Intensification (of Development)</b>	Development within the existing built urban areas which aims to increase densities and improve the quality of the city (number of dwelling units, residents and or employees).
<b>Land Use Mix</b>	The relative proximity of different land uses i.e. homes, stores, office, parks, within a given area, no standard measure.
<b>Light Rail Transit (LRT)</b>	Higher order transit that has the potential to preserve neighbourhoods, improve the natural environment, reduce greenhouse gas emissions, and improve air quality.
<b>Mixed Use Development</b>	Compatible residential and non-residential land uses within the same or on the same parcel of land. To provide a wide range of residential types within close proximity to employment, educational, social and recreational opportunities.
<b>Modal Share and Modal Shift</b>	Users of a transportation system choose the mode of transportation they will use. This mode may be a single occupant vehicle, ride-sharing, cycle, transit or walking. The modal share involves the percentage of users choosing each mode
<b>New Urbanism</b>	To reintegrate the components of modern life; housing, workplace, shopping and recreation, into compact, pedestrian friendly, mixed use neighbourhoods linked by transit and set in a larger regional open space framework.
<b>Region</b>	The Regional Municipality of Waterloo, officially came into being on January 1, 1973, established to legislation Bill 167 of the Province of Ontario. This Bill, known as the Regional Municipality of Waterloo Act, organized the local municipalities into the seven municipalities of Cambridge, Kitchener, Waterloo, Wellesley, Wilmot, Woolwich and North Dumfries.
<b>Regional Official Policies Plan (ROPP)</b>	A public legal document which sets our Regional Council's intent in the form of policies dealing with the future economic, social and land use changes within the Region of Waterloo, in a 20-year framework.

<b>Regional Transportation Master Plan (RTMP)</b>	To develop a long range transportation improvement plan for the Region. To identify the nature and/or location of new and/or improved facilities required to achieve transportation objectives and policies as provided in the ROPP.
<b>Re-urbanization</b>	To achieve environmental goals and improve the social and physical fabric of a community through the creation of a high quality, livable urban environment. Re-urbanization involves redeveloping already urbanized areas, which in turn decreases pressure for development of Greenfield sites. A key implication to re-urbanization is that new development is served by transit.
<b>Revitalization</b>	To define what is done to revitalized or healthy downtowns, based on what this type of downtown or other neighbourhood of a city is expected to possess. The definition is subject to experience and public perception.
<b>Smart Growth</b>	An efficient way to structure future growth while addressing issues of urban sprawl, including traffic congestion, low density development, agricultural land loss, and segregated land use.
<b>Street Connectivity</b>	The directness and availability of alternative routes from one point to another within a street network, measured by the number of intersections per square miles, average block length.
<b>Street Scale</b>	The three-dimensional space along a street as bounded by buildings or other features, described as human scale or automobile scale, measured by the average building setback or by the ration between building heights and street widths.
<b>Sustainable Development</b>	The process of meeting development needs without compromising or jeopardizing the ability of future generations to meet their essential needs.
<b>Transit Oriented Development</b>	Represents an alternative to urban sprawl. It involves sufficient density to encourage public transit. Location of residences, jobs and retail destinations close to public transit. Consists of mixed uses, with retail and employment within walking distance of residential area. Built on a grid transport network. And, containing urban design guidelines and design features to encourage pedestrian orientation.
<b>Transit Demand Management (TDM)</b>	Defined as maximizing the people moving capability of the transportation system. Initiatives aimed at reducing the demand for private auto use. It includes alternatives to driving and the measures or techniques that encourage the use of alternate modes.

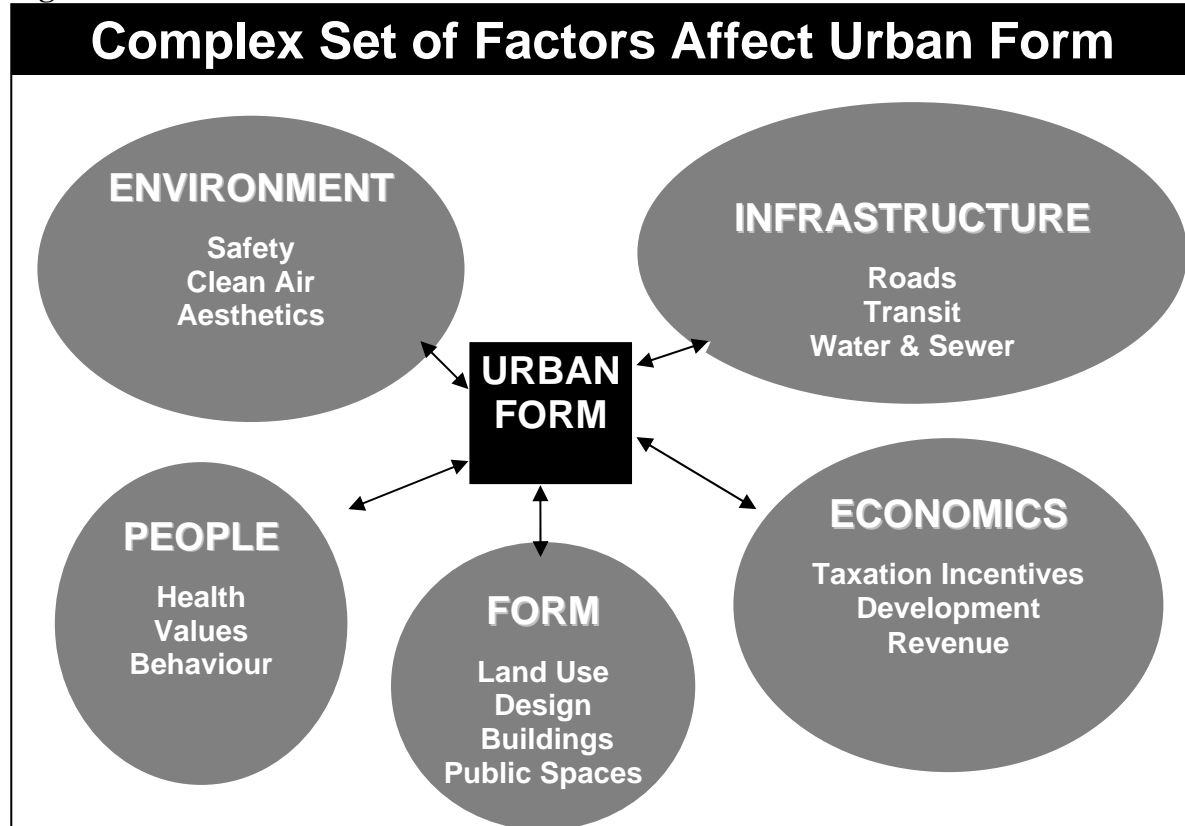
Source Adapted from: Handy (2002),  
Region of Waterloo (2002)

# 1 INTRODUCTION AND OVERVIEW

## 1.1 Research Question, Objectives, Theoretical Framework

The manner in which we design and build our communities can affect our physical and mental health. When we think about urban planning, we think about the form and arrangement of community, of urban, city and town planning. Urban form looks at the integration of land use and explores a range of aspects of the built and social environments. There are a complex set of factors that affect urban form (see Figure 1) which include the environment, infrastructure, people, form, and economics. The research recognizes cultural behavioural choices and activity patterns that affect air quality and environmental conditions, that encourage a lack of physical activity, a sense of community cohesion, highlight safety and accident concerns, and place individuals at risk for a range of health illness.

Figure 1



Source: Adapted Region of Peel Public Health (2008)

The research topic, 'Creating healthy communities through urban form', poses the research question, 'what are the attributes of a healthy community'? The research illustrates built environment factors that affect the health of individuals and neighbourhood communities. It examines how physical urban form and land use can affect and encourage healthy practices and healthy communities, while meeting increased population demand and growth. The research will expand knowledge on the relationship between land use mix, network connectivity and street design, site design, and density utilizing quantitative and qualitative methods.

The objective of the research includes an identification and examination of urban form attributes that characterize healthy neighbourhood communities, to verify the extent to which the neighbourhoods selected in the study replicate these attributes. The thesis explores how the selected neighbourhoods could be improved upon from a 'healthy city' perspective.

The objective prompts the question 'Are there healthy neighbourhood communities within the Region of Waterloo? Are there specific land use patterns or policy that promotes or discourage healthier lifestyle? The research will provide an outline of healthy neighbourhoods in Waterloo Region, and present 'healthy community form'. While growth management within the Region of Waterloo is entirely relevant and worthy of consideration in relation to its similarity with other growth communities within Ontario, I choose this Regional area due to my familiarity with its geography, having resided here since early 1981.

The research will examine contemporary Smart Growth policy with its focus on intensification and efficient urban form to determine criteria for healthier community practices in Canadian growth areas, while reinforcing elements of traditional planning and neo-traditionalism.

The theoretical framework for the thesis research was formulated from a neo-traditional understanding. Neo-traditionalism advocates a return to the traditional pedestrian environment; walking, cycling, taking public transit over auto use. The theory claims that people drive because

urban areas are poorly designed (O'Toole 2008). Peter Calthorpe promoted neo-traditionalism as a model of good urban design. In the 1980s and 1990s, Neo-traditionalism was referred to as the 'New Urbanism'. New Urbanism or Neo-traditionalism requires mixed use density and a focus on pedestrian places located near transit stations. It allows planners to rethink the relationship among form, scale and movement in modern urban environments.

What the Neo-traditional and New Urbanist plans deliver is a physical environment that invites neighbourhood interaction, rather than obstructing it, with land use and street patterns that permit more travel by foot, in a manner consistent with our sense of the traditional small town. In this, fundamental change in land use patterns is visualized as the promising tool. Policy is aimed at improving air quality or congestion by means of effective urban design linkages. Planners emphasize the many components necessary to obtain desired results: the straightening of streets to open the local network, the calming of traffic, better integration of land use and densities. The anticipation is that auto travel will decrease in a more compact and grid like mixed land use (Boarnet et al 2001).

The constraints imposed by the contemporary built environment have proven to be a driving force behind New Urbanism, offering a more pleasant, efficient and livable neighbourhood environment than the contemporary suburb. New Urbanism is built upon the idea that society is tired of conventional suburban development and will pay for an alternative (Frank et al 2003). The theory envisions physical design, regional design, urban design, architecture, landscape design and environmental design, as critical to the future of our communities. It is an attempt to apply the age-old principles of urbanism, diversity, street life, and human scale, to the suburb in the 21<sup>st</sup> century (Calthorpe et al 2001).



## **1.2 Topic Interest**

My interest in the topic area of ‘community health and urban form’ draws upon an employment background in the public sector, administering policy and programs to support efficient regional government planning and development. Intertwined with this, comes a personal observation on former land use planning; highway construction, inner city core renewal, suburban growth; witnessing a shift in community values and reduced greenspace or connectivity of land use, the very basics that create a community at the neighbourhood level. And in this, there is a recognition of escalating local environmental concerns and decline in overall community health. The question is posed, “can contemporary urban form create healthier neighbourhoods?”

## **1.3 Geographical Context**

Within the last five years, the Region of Waterloo has entered a new era in community planning and development. It presents a significant geographical study of an area undergoing extensive change in density and growth. The practical physical and policy change that the Region and local municipalities have undergone during this time period supports a response to the Province of Ontario’s growth mandate. Sustainable planning of communities and effective form remains crucial to health with the trend towards increasing population density.

Canada’s urban population continues to remain in four concentrated regions; lower British Columbia, Edmonton and Calgary, Montreal Quebec, and the Southern Ontario Golden Horseshoe area. As Map 1 indicates, these four regions show a growth in population of 8%, while other parts of Canada grew by less than 1%. In 2006, 51% of Canada’s population lived in these four regions (Canada Census 2006).

Within the Region of Waterloo, Ontario, an area of 1369 square kilometers, the 2006 Census Population stands at 478,121 (Statistics Canada 2006). In 2008, projected population

estimates for Waterloo Region were 533,700 (Region of Waterloo 2009). Waterloo Region continues to grow, with its population increasing by 9% annually, representing approximately 8,000 people per year. This now positions the Region of Waterloo as the 5<sup>th</sup> fastest growing municipality in Ontario, surpassing the cities of Toronto, Ottawa and Hamilton (see Table 1) (Region of Waterloo 2007). By 2031, the Region’s population is expected to grow to 729,000 (Region of Waterloo 2007).

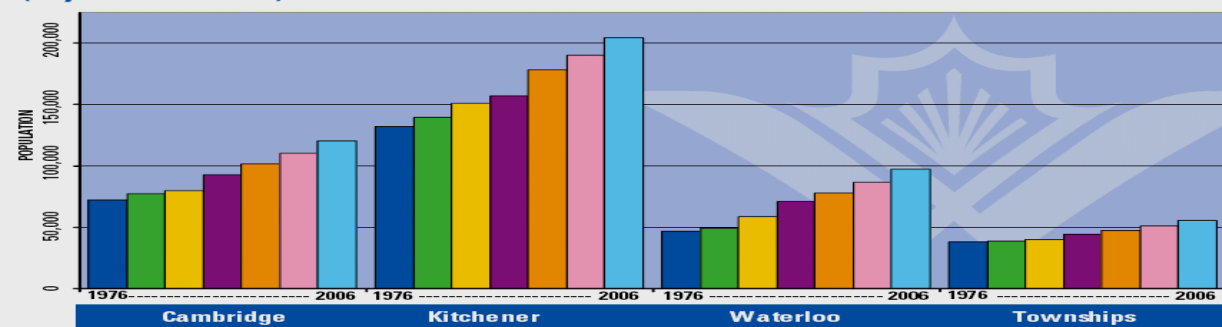
**Table 1: Ontario Population and Growth, 2001-2006**

Name	Population		Absolute Growth	% Growth
	2001	2006		
Toronto	2,481,494	2,503,281	21,787	0.9
Peel	988,958*	1,159,405	170,447	17.2
York	729,254	892,712	163,458	22.4
Ottawa	774,072	812,129	38,057	4.9
Durham	506,901	561,258	54,357	10.7
Hamilton	490,268††	504,559	14,291	2.8
<b>Waterloo</b>	<b>438,515</b>	<b>478,121</b>	<b>39,606</b>	<b>9.0</b>
Halton	375,229	439,256	64,027	17.1
Niagara	410,574	427,421	16,847	4.1
Middlesex†	403,185	422,333	19,148	4.7
<b>Ontario</b>	<b>11,410,046</b>	<b>12,160,282</b>	<b>750,236</b>	<b>6.6</b>
<b>Canada</b>	<b>30,007,094</b>	<b>31,612,897</b>	<b>1,605,803</b>	<b>5.4</b>

\* adjusted due to boundary change † incompletely enumerated Indian reserves and Indian settlements  
 †† revised counts  
 Source: Statistics Canada, 2001 and 2006 Census by Census Divisions

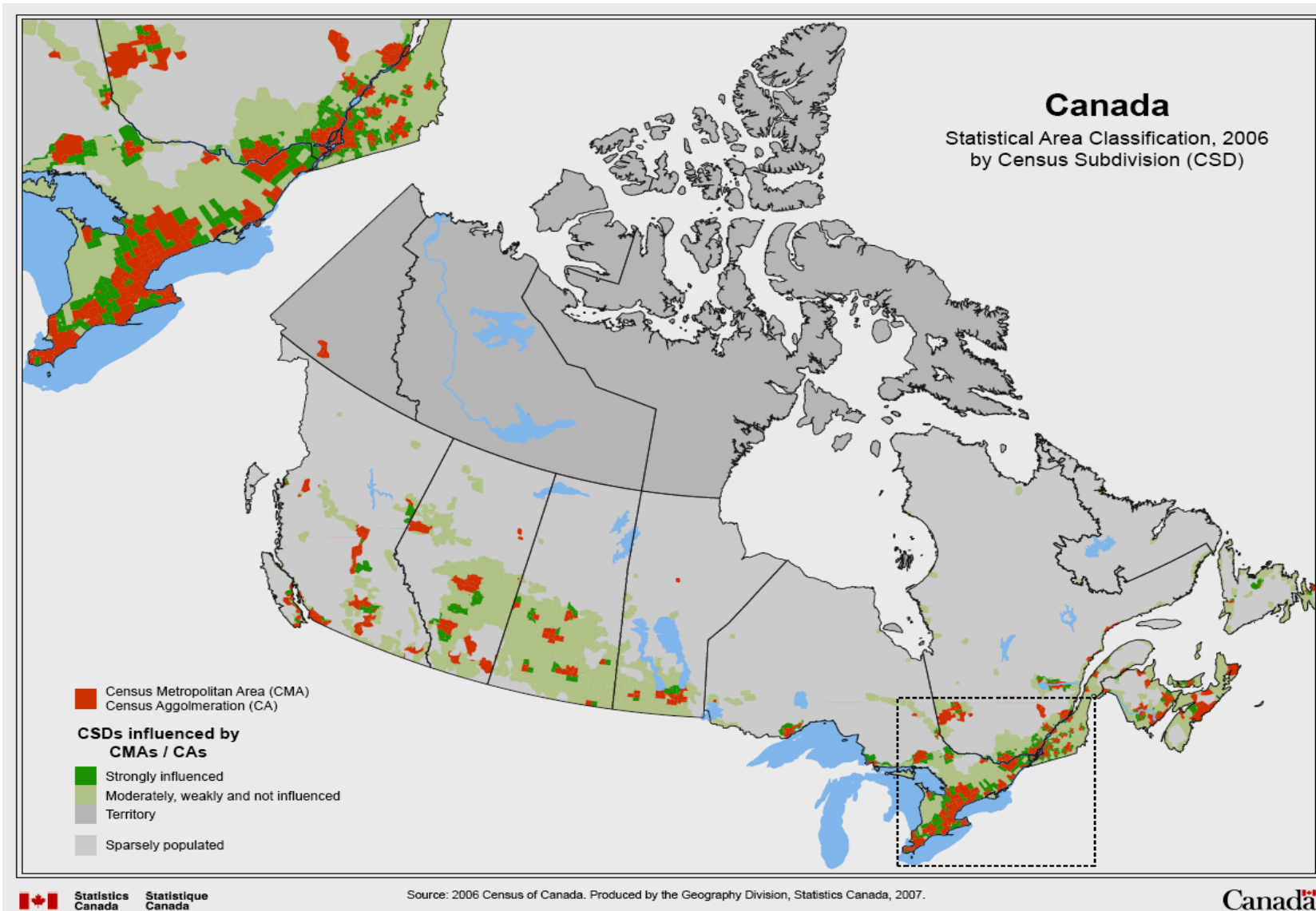
Within Waterloo Region, the population from 2001-2006 increased in all area municipalities (see Figure 2). Kitchener had the largest increase in population with an additional 14,269 residents, Waterloo at 10,932 and Cambridge at 9,999. The cities represent almost 90% of the Region’s growth. The numbers indicate a consistent increase in regional population over time and one that warrants careful urban planning.

**Figure 2 Waterloo Region Long-Term Population Growth, 1976-2006 (5-year Intervals)**



Source: Statistics Canada, Census 1976-2006

Map 1. Statistical Area Classification Map 2006



## **1.4 Structure of the Thesis**

The structure of the thesis includes eight chapters. Chapter 1 covers an overview of the topic area and research question, research objectives, theoretical framework, topic interest and geographical context. Chapter 2 presents a literature overview of the healthy community concept, what the healthy neighbourhood community looks like, the smart growth model, built environment factors: land use mix and density, network street connectivity and street design, site design and green infrastructure, the relationship between community health and urban form, the land use planning policy context at both the regional and municipal levels, key public health reports that support the research, the economics of urban form, comparative Ontario municipality urban form community guidelines, along with key finding and conclusions in the literature and existing policy.

Chapter 3 describes the research methods used, benefits and disadvantages of qualitative and quantitative research strategies, pros and cons of those methods, and the link between the research questions, objectives, and methods. Chapter 4 presents a triangulation in observation, key informant interview and key informant questionnaire, contrasting the research study neighbourhoods with indicators of healthy communities, providing rationale for selection of the study neighbourhoods, reference to public health reports and additional published information as a frame of analysis in examining these communities.

Chapter 5 provides an analysis of key findings with comparative public health reports and literature context, and key findings relevant to existing policy context; as well, how the findings address the research question and objectives. Chapter 6 summarizes the research into conclusions and recommendations in relation to planning practice in general, in Waterloo Region, and the specific research study neighbourhoods. This chapter includes reflections on the research experience. Chapter 7 includes the references, and Chapter 8, the research instrument materials.

The thesis topic is significant in an examination of past and present urban policy, movement or trends, with contemporary understanding of urban form. It illustrates strategies for new urban form and community participation towards implementing the Province of Ontario's Smart Growth policy; as well as supporting Regional and local growth policy: Growth Management Plans, Master Transportation Plans, Urban Design and Development Plans, Height and Density Plans, Transit Oriented Development, Public Health Air Quality, Pedestrian Environment plans, Community Development Plans, Arts and Culture Plans, Heritage Conservation Plans, Housing Plans, to name a few.

The research reinforces the relationship between urban form and public health planning as a contribution to policy that improves neighbourhood health and urban form in Canadian communities. It seeks to provide awareness of health impacts within the built environment; as well the research provides a basis for future studies correlating Canadian growth policy and healthy neighbourhood form, with particular significance as a Southwestern Ontario study.

## 2 LITERATURE REVIEW

### 2.1 Overview

The literature review covered 180 materials on land use, urban form, healthy communities, public health, and alternative transportation systems, and made use of a range of secondary data: authoritative books, scholarly and general periodicals, newspapers, specialized reference, government documents, academic dissertations, web sites, published literary works, unpublished primary documents.

The analysis provides an overview of three public health reports, two on neighbourhood case study; Fisher, (2005) *Urban Form, Physical Activity and Health*; McCormick, (2006), *Compilation of Data Relating to Urban Neighbourhoods in Waterloo Region*; and Schumilas, (2007), *Healthy Growth: Health and the Built Environment*. As well, relevant supporting materials were reviewed from the Regional Municipality of Waterloo: *Transportation Master Plan* (2008), *Regional Growth Management Strategy* (2006), *Regional Official Policy Plan* (2009), *Inventory of Pedestrian Environment study* (2008), *Air Quality and Urban Health Impact Report* (2008).

In addition to recent federal and provincial health studies which link health to land use planning reviewed in the thesis research, including: The Ontario College of Family Physicians, *Report on Public Health and Urban Sprawl in Ontario* (2005); Canadian Mental Health Association Network Journal, *We are Where We Live* (2008), and the Ontario Planning Journal article, *Healthy Communities, Sustainable Communities, A Call to Action* (2007).

The Literature review was structured into specific areas in an effort to explain the multitude of research studies to present healthy urban form in neighbourhood health. These include: the healthy community concept, what the healthy neighbourhood community looks like, Smart Growth model, built environment factors: land use mix and density, network street connectivity

and street design, site design, the relationship between community health and urban form. As well, land use planning policy context, linked transportation planning, public health reports, key findings and conclusions. The review also provides a comparative to six other Ontario municipality urban form community guidelines in an effort to present and evaluate healthy community form.

## **2.2 The Healthy Community Concept**

Since early urban settlement, the public policy goal has been to build healthier communities. Endemic problems related to poor water supply, sanitation, lack of light and poor air quality triggered a response in terms of infrastructure engineering and design. Boards of Health established codes to regulate all manner of practices and behaviors in the interest of public health. Ebenezer Howard, who pioneered “garden cities” in the 1890s, led the way in planning communities that were more environmental and socially healthy.

With the arrival of modern medicine in the 1930s, this public health approach to creating healthier cities and communities became overshadowed by medical interventions focused on the individual (Ashton 1992). It was not until the mid-1980s that a new healthy cities and communities movement was brought into being by the national and local organizations of the World Health Organization (WHO).

The concept of a ‘healthy community’ is determined by equitable access to basic prerequisites for health: a safe physical environment, clean water and air, food, adequate resources, access to transportation, education, income, social supports. The European World Health Organization (WHO) defines a healthy city as:

- A clean safe physical environment of high quality (including housing quality)
- An ecosystem that is sustainable now and sustainable in the long term future
- A strong mutually supportive and non exploitative community
- A high degree of participation, and control, by the citizens over the decisions affecting their lives, health, and well-being

- The meeting of basic needs (food, water, shelter, income, safety, work) for all the city's people
  - Access by the people to a wide variety of experiences and resources, with the chance for a wide variety of contact, interaction, and communication
  - A diverse, vital, and innovative economy
  - The encouragement of connectedness with the past, with the cultural and biological heritage of city dwellers, and with other groups and individuals
  - A form that is compatible with and enhances the preceding characteristics
  - An optimum level of appropriate public health and sickness care services, accessible to all
  - High health status (high levels of positive health and low levels of disease)
- (WHO 1995) <sup>(1)</sup>

The 'healthy city' idea was developed in Toronto in the early 1980's by local health planner, Dr. Trevor Hancock. The concept was reinforced by Ilona Kickbush, a Health Promotion Officer, who, along with Leonard Duhl, public health professor at UC Berkeley, took the 'healthy city' idea back to the World Health Organization, which later became a European project (Sarawak 2009). The 'healthy city' program was later incorporated into Canada as the 'healthy community' program, to include 'communities' and 'neighbourhoods'.

Key within this definition of a healthy city is that the 'healthy city' is one that continually seeks to improve the health of its citizens (WHO 1986). While the planning process enables people to increase control over and improve their health through applying the concepts and principles of health promotion at the community level.

Health policies related to urban planning include urban form factors; land use mix and density, network street connectivity, street design, and site design, and can play a significant role in shaping the health and well-being of the residents of the community. Cities must also become greener for the sake of many species and humans who inhabit them, and as a model for future cities (Ritchie et al 2009).

Healthy community form strives to focus on planning and designing communities that make it easier for people to live healthy lives, while offering important benefits: promoting physical

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(1) World Health Organization, Europe (1995)



activity, improving neighbourhood air quality, lowering the risk of accident or injury, increasing the social connection and a sense of community, reducing any negative contribution to climate change (CDC 2008).

## 2.3 What the Healthy Neighbourhood Community Looks Like

The healthy community philosophy (Healthy Communities Coalition 2000) encourages the creation of policies that promote and enhance health in traditional ‘non-health’ sectors i.e. housing, employment, transportation, (urban design). Healthy Neighbourhood community form (see Map 2) takes into account sustainable livability, with adherence to local and provincial growth plans.

### Healthy Urban Form and Development Design Attributes:

- Walkability:** to create walkable neighbourhoods that are well connected and fully accessible to major destinations and surrounding neighbourhoods.
- Variety:** to build neighbourhoods that provide a range of housing types, parks and open spaces and neighbourhood focal points.
- Placemaking:** to create streetscape quality, and contribute to neighbourhood character and sense of place.
- Conservation:** to conserve, protect and integrate existing natural and cultural heritage resources.
- Connectivity:** to provide multiple route options for all modes of travel.
- Transit Supportive:** to design and build neighbourhoods that provide greater opportunity for transit usage.
- Safety:** to promote design practices that contribute to neighbourhood safety.
- Balance:** to promote neighbourhood design quality through a balanced approach with economic considerations.
- Livability:** to promote design solutions that contributes to sustainable practices, the celebration of arts and culture, health and complete communities (City of Kitchener 2007).

### 2.3.1 Walkable Neighbourhoods

Healthy community form creates walkable neighbourhoods that are well connected and fully accessible to major amenities, destinations and surrounding neighbourhoods, employment and transit ways. Healthy neighbourhood urban form promotes a mixed fused grid street network pattern that allows for direct connectivity with shorter block lengths and shorter 5-10 minute walking distance. Safe decorative crosswalks (see Figure 3) encourage neighbourhood walkability where traffic calming measures can also be incorporated.

Focal points in the neighbourhood include: parks, schools, transit routes, priority lots and planned commercial areas. Parks and trails are to be situated with a 400-500 m 5 minute walking radius to the outer edge, with interconnecting cycle pathways, while street connections along transit routes are maximized. Multiple street connections include linkages to community trails (see Figure 4), parks, transit routes, and arterial streets. Local institutional and commercial uses are close to the street and surround residential neighbourhoods for easy travel access. A pedestrian friendly street environment should encourage aesthetically attractive streetscape elements and green infrastructure, which include sidewalks along street frontages.

**Figure 3, Crosswalk, Country Hills**



Source: Liptay (2007)

**Figure 4, Walkable Trail, Mary Allen**



Source: Liptay (2008)

### 2.3.2 Variety in the Neighbourhood

Variety in healthy neighbourhood form looks at building neighbourhoods that not only provide a range of housing types, but includes parks, open spaces and neighbourhood focal points. Healthy neighbourhood form supports a pedestrian environment with clear landscaped streets or neighbourhood elements and open cafés which invite community activity and safety. Small scale park spaces (see Figure 5) include trails that have landscaped gateway entrances, some including roundabout intersections to provide traffic calming and focal point landscape (see Figure 6).

**Figure 5, Park, Mary Allen**



Source: Liptay (2008)

**Figure 6, Community Focal Point**



Source: University of Waterloo (2007)

### 2.3.3 Neighbourhood Sense of Place

A sense of belonging and sense of place relate to the attachment people feel towards their community. When people experience a sense of belonging, they also feel as if they have a stake in a place (Roseland 1997). Placemaking involves creating streetscape quality (see Figure 7), and contributes to neighbourhood character and a sense of place. Neighbourhood form, function and character is also influenced by the sensitive integration of existing site features in combination

with other primary design elements such as street hierarchy, the lotting pattern, parks hierarchy and gateway features (see Figure 8).

Neighbourhood Sense of Place is created by integrating natural features such as mature trees, woodlands, valleylands and wetlands through land dedications, creative parks and open space, planning street alignments such as single loaded streets or alternative lotting (City of

**Figure 7, Streetscape Quality, Westvale**



Source: Liptay (2007)

**Figure 8, Gateway Features, Focal Point**



Source: Liptay (2008)

Kitchener 2007). Gateway features can consist of trees and shrubbery or decorative wall entrances that define the neighborhood place. This also includes landscaped medians with enhanced boulevard treatment.

#### **2.3.4 Conservation**

Conservation within the healthy neighbourhood involves conserving, protecting and integrating existing (or relocated) natural resources (see Figure 9) and cultural heritage resources (see Figure 10). The idea is to establish lot width and size to integrate local cultural heritage into proposed development. Lighting and fencing should be traditional form and construction, as well, park space elements such as interpretive signage, seating area and public art can be included.

**Figure 9, Natural Resource, Cambridge**



Source: Liptay (2008)

**Figure 10, Cultural Heritage, Central Park**



Source: Fegan (2008)

### **2.3.5 Connectivity**

When we think about connectivity in neighbourhood form, we look at providing multiple route options for all modes of travel. Creating a mixed fused grid-street pattern should be encouraged, based on a hierarchy of streets that provide connectivity and a transit accessible route. Linkage should also be provided to existing neighbourhoods and other destinations through a pedestrian environment. Shorter block lengths provide access to pedestrian destinations with the provision of accessible transit.

Street connections (see Figure 11, 12) should be spaced at 60-70 m blocks, with single loaded streets situated along natural features, parks and open spaces. Transit stops should be placed near gateway entrances, planned commercial areas, employment areas, high density housing blocks, employment to housing areas and parks. Creative street alignments should be encouraged to enhance neighbourhood focal points and priority streets (City of Kitchener 2007).

The local street system should be integrated with the arterial street with multiple points of access between 200-400 m in length. There should be clear and direct pedestrian access to arterial streets through street or block designs. Collector streets should accommodate bicycle lanes, on-

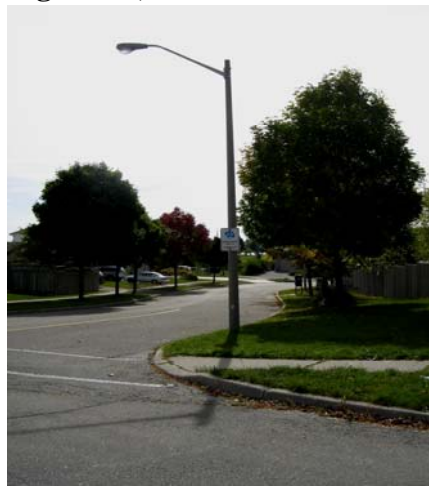


**Figure 11, Street Connectivity**



Source: Liptay (2008)

**Figure 12, Laurentian West**



Source: Liptay (2008)

street parking, shared bike or parking lanes, streetscape elements and transit. Collector streets should range between 18-28 m in length. Local streets should be reduced or narrowed mixed contemporary style with single loaded streets and alternate lotting patterns, and accommodating on street parking.

### **2.3.6 Transit Supportive**

A transit supportive neighbourhood requires design and build neighbourhoods that provide greater opportunity for transit usage. Transit stops should be located near the main entrances of commercial, employment areas or high density housing blocks, employment-residential areas and parks. Neighbourhood accessibility is improved when transit routes (see Figure 13) are located along major collector streets.

The idea is that Regional transit systems are improved on an on-going basis through the addition of rapid transit service and the implementation of Transit Business Plans. As crucial is the improved linkage between the Regional transit system and existing or planned inter-regional transit systems. Regional or Area Municipal Roads or dedicated rights-of-way outside of mixed

traffic should also accommodate existing or planned high frequency transit service (Region of Waterloo 2009).

**Figure 13, Uptown Waterloo Transit**



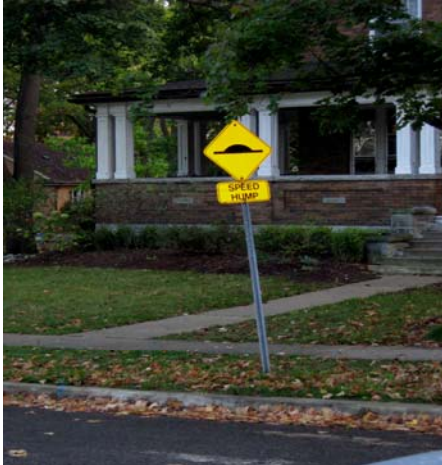
Source: Liptay (2007)

### **2.3.7 Safety**

Safety is a consideration in healthy neighbourhood form, to promote design practices that contribute to neighbourhood safety. Safety goes beyond safe crosswalks, to include a variety of traffic calming measures within the proposed street network such as roundabouts, curb extensions, speed humps (see Figure 14) landscaped medians, sidewalks, as well as one way streets (see Figure 15) to calm traffic. Traffic calming should be encouraged along collector streets, major pedestrian intersections and crossings, to neighbourhood parks, community trails, planned commercial areas and school sites.

There is a renewed interest in traffic calming as a safety element, with a number of communities involved in programs to make streets more pedestrian and cycle friendly. Streets are no longer viewed as arteries only for moving vehicles, but also as settings for multiple users.

**Figure 14, Speed Hump, Shades Mills**



Source: Liptay (2008)

**Figure 15, One Way, Mary Allen**



Source: Liptay (2008)

### **2.3.8 Balance and Livability**

Balance promotes neighbourhood form and development design quality through an approach with economic consideration. It involves a combination of creating walkable neighbourhoods, establishing neighbourhood structure, reinforcing neighbourhood character and livability and integrating neighbourhood mixed use centres. Local mixed use centres include commercial centres accessible to surrounding neighbourhoods, providing focal points or identity to the area. Balance includes a vision and opportunity link to various neighbourhood areas; downtown, community nodes, intensification corridors, new communities, employment areas, complimented by efficient economic support.

Livability promotes urban form and design solutions that contribute to sustainable practices, the celebration of arts and culture, healthy and complete communities, making certain that community residents enjoy quality of life and opportunities for healthy behaviours and lifestyles. It integrates specific design elements in the public and private realm that create or reinforce neighbourhood character, such as tree planting and interesting park spaces, trails and walkways and cycle paths, and also includes elements like noise mitigation and on-street parking.



When re-designing urban neighbourhoods, urban form must place greater focus on the pedestrian realm, with a new cultural outlook towards reduction of the private auto. In this, the theory of Smart Growth seeks to improve public health through community development and change.

## HEALTHY NEIGHBOURHOOD URBAN FORM



Mixed use, open street cafés invite community activity, safety



Rooftop gardens and energy options for city core areas



Local Parks and trails. 400-500m 5 minute walking radius to outer edge



- Priority Street
- Transit Route
- Heritage House
- Park Space or woodland
- Bike Route
- Traffic Calming (roundabout)
- Neighbourhood Gateway
- Walking Trail
- Park Entrance Structure
- Community Gateway
- SWM Facility
- Future Development

Source: City of Kitchener (2007)



Roundabouts provide traffic calming on major streets and focal point landscape



Street connections along transit routes spaced 60-70m blocks



Wider collector (main) streets 18-20m to include 2 lane cars, on-street parking, cycle lanes, landscaped medians. Bicycle lanes 1.2-1.5 m width. Reduced narrow local streets to 13m, 3m sidewalk



Sample Mixed Fused Grid Street Design, neighbourhood linkages



## 2.4 Smart Growth Model

Smart Growth is the broad movement that advocates change in the way our cities grow. The theory integrates land use and transportation decisions. It encourages compact, mixed use development within existing urban areas and discourages dispersed, auto dependent development at the urban fringe. Smart Growth creates more accessible land use and connective street patterns, supports transportation alternatives, and improves community livability (TDM 2007).

Smart Growth accepts the premise that growth is inevitable and is, in fact, good; but it attempts to channel it so that the creation of jobs and the generation of new tax revenue is not undermined by hidden costs. These costs include time lost to long commutes, health impacts from decline in air quality, (illness related to physical inactivity) and investment opportunities lost when new companies choose another city ‘doing it right’ (Canadian Urban Institute 2001). The fundamental premise of Smart Growth is to create and follow a plan, to only fund new infrastructure investments compatible with the plan. It is about making use of creative financing and funding solutions to achieve a desired type of development.

In order for urban areas to be sustainable, development patterns need to be more compact, diverse in land use, and have defined urban boundaries. Density and mixed use development are among the most important from a Smart Growth perspective. These factors reduce the per capita consumption of land, lower the cost of per unit infrastructure, reduce trip lengths, make public transit more viable, increase walkability and help preserve the environment (Tomalty 2005).

Land use practices are at the heart of local growth problems, while reducing automobile use and its impact on the environment is cornerstone to the Smart Growth movement. The Smart Growth transportation choice looks at automobile dependence as having negative environmental, social and economic impacts, including air pollution and social segregation, where it requires

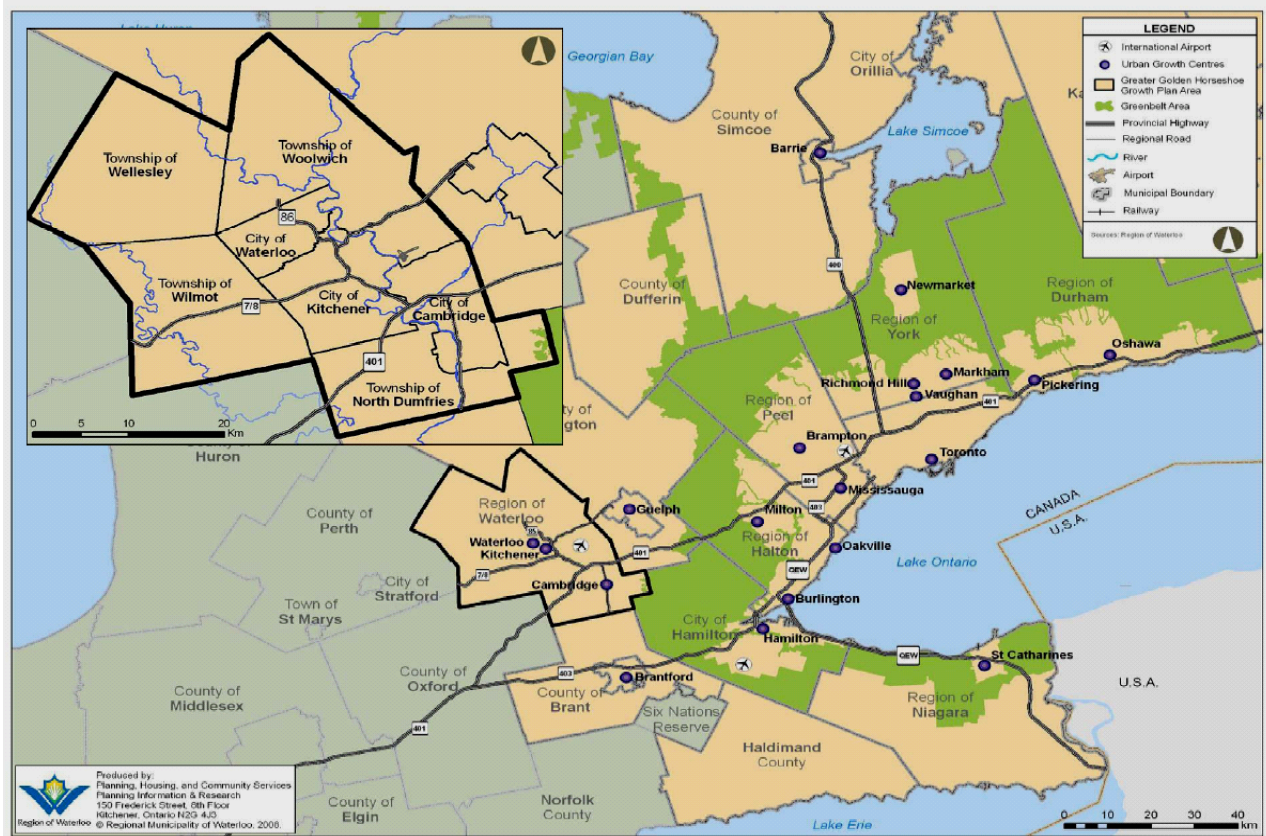
substantial investment of public funds to build and maintain roads and other automobile infrastructure.

Smart Growth provides a stronger sense of neighbourhood cohesion. It makes it easier for people to embrace transport alternatives by reducing the use of the private vehicle, promoting compact urban design and healthy walkable neighbourhoods. The theory suggests that the most effective approach is to minimize sprawl and to maximize the use of space in existing urban development through housing infill, mixed land use and other projects that support increased population density. This includes transit oriented development, where an easily accessible transit center links residents to an urban core. Benefits of the Smart Growth model include reduced traffic congestion, reduced pollution, increased individual health, aesthetically pleasing neighbourhoods, and a stronger sense of neighbourhood connectivity.

Smart Growth serves to improve public health through addressing factors leading to certain diseases (TSC Berkeley 2004), on managing negative health detriments that come with increased vehicle use. Southworth (1997) recommends that urban design be constructed in the context of health and well-being of the community as a whole, while also addressing long term fiscal, social and environmental sustainability considerations.

The Smart Growth model is achievable through an arrangement of government policies focused on growth management. The Province of Ontario's 2006 Growth Plan, presented under the *Planning Act* in 2005, aspires to control sprawl, protect the environment, and build stronger, healthier more compact communities. *Places to Grow* (2005) provides legislation on how to accommodate growth by examining how communities grow and evolve, with focus on the Greater Golden Horseshoe area (see Map 3). The focus is on re-urbanization, higher density, mixed land use preserving outer edge land use, preventing urban sprawl, with focus on transit options.

**Map 3, Ontario Greater Golden Horseshoe**



Source: Region of Waterloo (2008)

*The Provincial Policy Statement (PPS)* (2005), issued under the authority of Section III of *The Planning Act (2005)*, provides direction on matters of provincial interest related to land use planning and development, and promotes a provincial policy-led planning system. The Provincial Policy Statement includes enhanced policies on key issues that affect local communities such as: the efficient use and management of land and infrastructure; protection of the environment and resources, to ensure opportunities for mixed use residential development. Within a similar time frame that the Policy Statement came into effect, *The Strong Communities (Planning Amendment) Act* (2004), was introduced, supporting the PPS.

The Provincial Growth plan promotes an integrated land use plan. It encourages municipalities to offer a balance of transportation choices that promote transit, cycling and walking in order to be a sustainable system. Public transit and transit infrastructure to shape



growth is priority within the Growth plan. At the Local and Regional levels, Growth Management Strategy has led communities through a strategic framework which identifies where, when and how future growth is to be accommodated. Growth management policies and urban land use mix planning will continue to have a direct bearing on public health in Ontario (Bray et al 2005).

## **2.5 Land Use Mix and Density**

The way we use and plan the development of the space in which our neighbourhoods exist is crucial to the creation of sustainable infrastructure and vibrant healthy communities. The planning process affects how communities use their land, and how they grow and develop over time. In previous years, land use planning has sometimes been carried out on an ad-hoc basis with development decisions being made in isolation from considerations of long term and the community landscape. This has led to urban forms that are pre-disposed to sprawl, car focused networks, with separation of living, working and leisure spaces; the public realm deteriorates and opportunities for nature and social interaction decline (CRC 2009).

Healthy mixed use infrastructure supports closer knit neighbourhoods and the development of high density areas. Density can be a controversial topic. Those against high density envision a return to the unattractive city of the past and dangerous urban life (Kushner 2007). Provincial mandates, population projections and housing demand deem that communities increase density and make neighbourhoods walkable with healthy sustainable urban planning. Mixed-use development, as the practice of allowing more than one type of land use in a building or set of buildings, is the favoured norm. In planning terms, increased density and mixed use look at area combination of residential, commercial, industrial, office, institutional or other lands uses.

Today, planners and developers recognize that the urban form of communities encourage a design-based approach to create communities that promote a sense of place, have integrated street networks with transit-oriented development, integrate natural and heritage resources and include

walkable neighbourhoods with interesting streetscapes, focal points and destinations (City of Kitchener 2007). A mix of commercial, business and retail uses reduce the need for people to travel. Mixed use areas can be pedestrian friendly, while compact building design also allows more open space to be preserved for recreation and nature. Public transit is easier to plan with reduce auto use, and a neighbourhood area that encourages community engagement, as well as increasing opportunities for business to bring more tax revenue and higher property price.

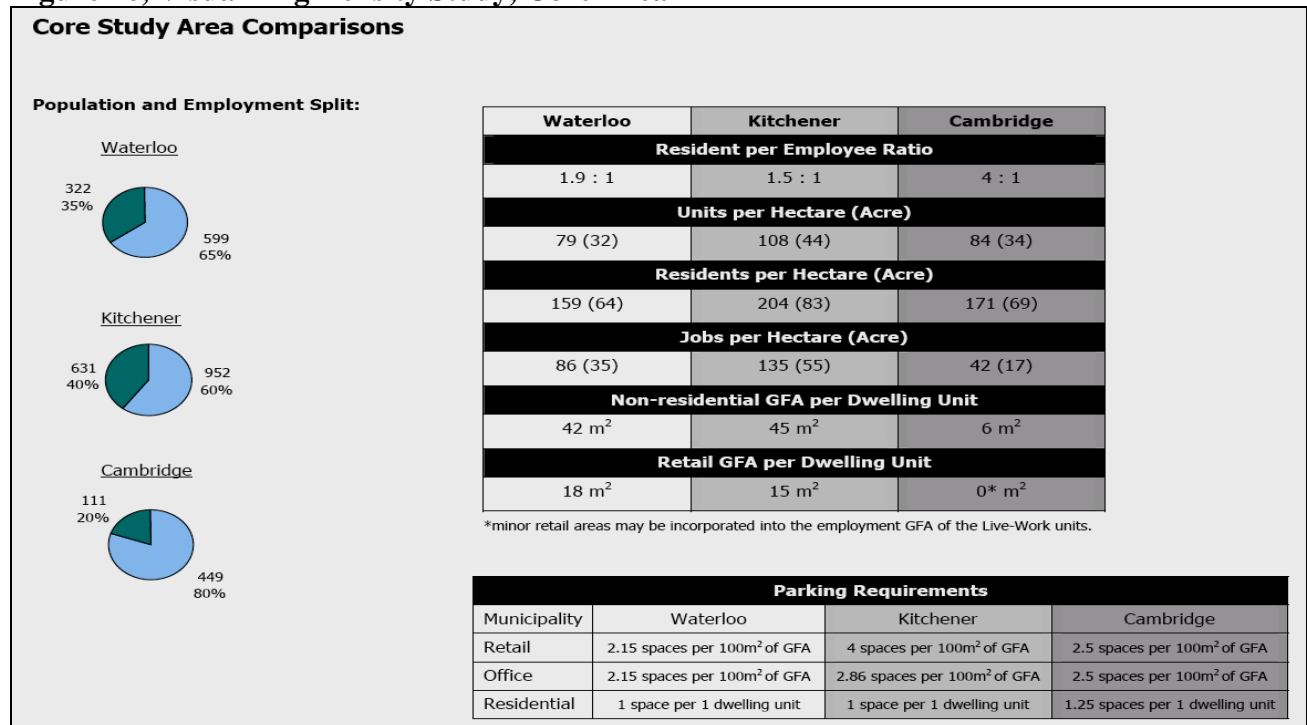
By increasing density through mixed compact design, the required population base for local business and transit success is provided, whereas neighbourhood network connectivity can be achieved. When we consider urban form neighbourhood study and its importance to local health, we can compare mixed use land and density in the core and suburban areas.

In 2006, the Region of Waterloo undertook an extensive Density Study in the three city core areas; Kitchener, Waterloo, Cambridge, and specific suburban study areas. Each area balanced reurbanization requirements and took into account the Province's density targets for urban growth centres (see Figure 16). The Cambridge core study area showed increased densities in buildings from 3-11 stories. Its density is mostly 80% made up of residential use as the study area is seen as a good location for additional dwelling units due to its proximity to the river and other residential areas. Density would also bring more residents to the inner core.

The Waterloo core study area focused on a split among building uses. 1.3:1 office area to retail area ration reflected the highest balance of employment uses of all 3 study areas (Kitchener 2:1, Cambridge minimal retail area). The buildings' masses and heights take into account the Waterloo area's physical aspects (smaller redevelopment parcels and more mixed use on King Street Corridor). Although, the design concept number of units per hectare is similar to Cambridge. The Kitchener core study area had the highest density, due to the potential rapid transit station area and proposed high density mixed use zoning. It had the highest number of

units per hectare. However when compared to the study area size (on per hectare) Kitchener is smaller than Waterloo (10m<sup>2</sup> vs. 16m<sup>2</sup>). As a result, the Waterloo core study area indicated the study area with the most mixed uses (Region of Waterloo 2006).

**Figure 16, Visualizing Density Study, Core Area**



Source: Region of Waterloo (2006)

In the 2006 Region of Waterloo Visualizing Density Study, the three study urban areas indicate mixed use and transit-supportive suburban neighbourhoods through three different design concepts. Each depicted different layouts and locations of higher density use, different types of open space and mixed land use, all incorporate connected road and pedestrian network, range of housing units and multiple neighbourhood amenities. What is key in urban form for neighbourhood communities is that as the density of units increase, a higher percentage of open space can be provided in each study area compared to the percentage of open space their current area or conditions holds. The potential is there to create greenspace and healthier neighbourhoods through increased density. Figure 17 and Figure 18 provides a visual example of visualizing



density in Uptown Waterloo, where density has the potential to increase by 118 while presenting a re-creation of the existing 2008 urban form.

**Figure 17, 2008 Density**



Source: Region of Waterloo (2008)

**Figure 18, Future Projection**

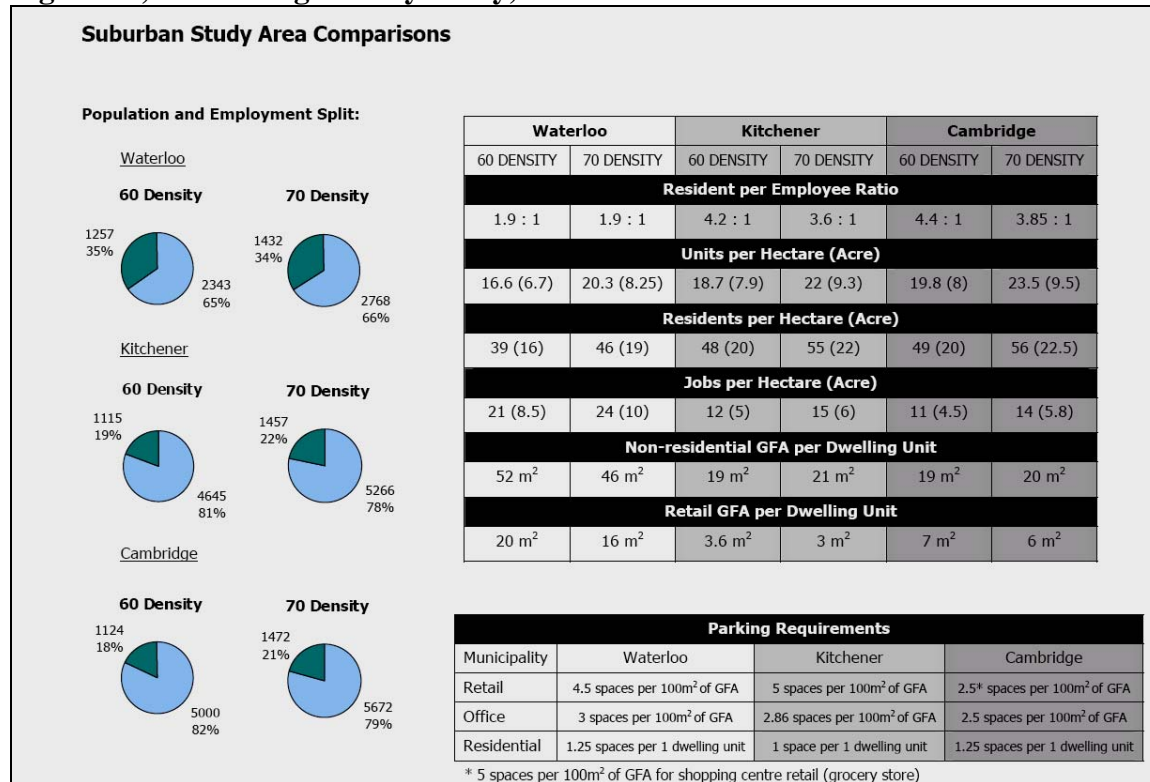


Source: Region of Waterloo (2008)

Waterloo Region suburban study area (see Figure 19) ‘minor node’ designation promotes more employment use within the area and had results in the highest proportion of employees to overall density, with highest number of non residential Gross Floor area per dwelling unit. The other two study areas showed a similar percentage of employees. The significant change is in the density from 50 to 60. The increase in density to 60 would require reconfiguring road patterns and land parcels. It would also provide for greater connectivity throughout the community and help the movement of transit vehicles through the neighbourhood. Density can also be defined as the number of dwelling units per hectare or acre. Recent developed subdivision yield is from 13

to 19 units per hectare (or 5 to 7 units per acre). The design concepts presented in the subdivision study areas yield is 17 to 20 units per ha (or 8 to 9.5 units per acre) in the 60 density design concepts. Network connectivity can therefore be more efficiently established by increased density through urban form.

**Figure 19, Visualizing Density Study, Suburban Area**



Source: Region of Waterloo (2006)

## 2.6 Network Connectivity and Street Design

Efficient network street connectivity increases pedestrian mobility and trips, provides good traffic distribution, safe pedestrian and cycling conditions, has barrier free access, supports effective public transit, and provides an interconnected street pattern between neighbourhoods and other areas. Street design addresses the quality of the street to support walking, cycling and public transit. It calms or discourages traffic and supports the pedestrian presence through street

amenities; crosswalks, sidewalks, bikeways, transit, landscaped medians. The key is to ensure that the street network, including layout and design, accommodates all intended users.

Prior to the 20th century, cities and towns were already compact, containing narrow streets active with pedestrian activity. Later, the majority of these settlements were adapted to accommodate the private automobile with wider roads, while additional space was allocated for vehicle parking and lower population densities. Lower population densities led to urban sprawl with longer distances between locations, and traffic congestion made alternatives to the auto both unattractive and impractical, while created conditions for increased traffic.

This process led to change in urban form and living patterns where it became difficult for people to live without an automobile. At the same time, new constraints were added: noise, toxic air pollution, reduced physical activity and pedestrian safety. Automobiles required streets designed for speed and driving safety, attributes that were lacking in the traditional pedestrian street (Grammenos et al 2002).

In this, network connectivity and street design declined. The elimination of treed boulevards and the transfer of the responsibility for street trees from the municipality to the developer also began to alter many of the qualities of the traditional street. A new hierarchical street pattern favoured crescents, cul-de-sacs and curved roads, to break what had come to be considered the monotony of the grid street pattern (see Map 4), and created a less permeable neighbourhood (Sandalack 2005). Pedestrian connectivity was enabled through pedestrian walkways at midblock or at the end of cul-de-sacs (see Map 5) (Handy et al 2003). Suburbanization was seen as a vital force not only in urbanizing the countryside, but also in revitalizing the city (Southworth 2001).

This standardized approach to roadway infrastructure design played a role in determining the urban form and development of communities (TRB 2005). Today, street design pattern should follow models for healthy livable communities. Current thinking on street pattern form is divided

between concern for the efficiencies of infrastructure and traffic, and a consideration of aesthetics. This generally translates into a difference between conventional suburban loops or cul-de-sacs, and traditional grid models. Although the Grid model approach typifies Smart Growth theory, what is required is a hybrid street pattern that provides greater connectivity but avoids clear, fast routes for non local traffic to cut through residential neighbourhoods (Ewing et al 1996).

**Map 4, Traditional Grid Street Pattern. Center Core**



Source: Region of Waterloo (2005)

**Map 5, Contemporary Cul-de-sac Suburban Street Pattern**



Source: Region of Waterloo (2005)

One of several contemporary options could be Fanis Grammenos', Fused Grid (CMHC 2008) (see Map 6), which brings together the most desired features of both conventional and traditional design to create a people-friendly environment that combines the quality of life associated with open spaces with safe, sociable streets and easy connectivity to community facilities. The goal of the Fused Grid design is a better balance between providing efficient routes for vehicular traffic, providing safety and opportunities for pedestrian activity within neighbourhoods (Stratford 2004).

Efficient street design contributes to the quality and character of a community since appropriately designed streets create safe, interactive and healthy environments. Grammenos



(2003) maintains that grid street patterns consume as much as 35% of land in street right-of-ways. This amount can be reduced by taking some streets out of circulation. Cul-de-sacs can reduce this to 24%, but in the process, connectivity is lost. The fused grid uses grids, loops and cul-de-sacs, but connects using open space (parks and pathways), creating a larger pedestrian realm and improves the appearance of neighbourhoods.

Streets, and the spaces adjacent to streets such as sidewalks, form an important transportation network. Their importance for travel by all modes can not be overstated, for they connect every destination to one another. Street networks influence trip route and mode choice

### **Map 6, Fused Grid**



Source: CMHC (2008)

through the ways in which trip origins and destinations are connected. A central problem faced by planners in postwar years, is that street patterns inhibited walking, were disorienting to pedestrians (as well as drivers) and did not provide efficient connectivity (CMHC 2008).

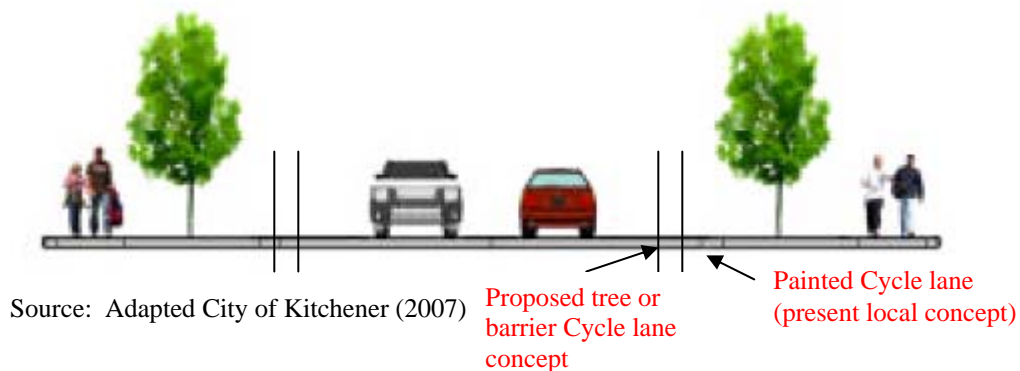
Local neighbourhood street form needs to encourage landscaped boulevard treatments and functions along primary collector streets such as bicycle lanes (1.2-1.5m) and primary gateway features. The standard right of way street (see Figure 7) can accommodate basic street functions with overlap between travel lanes and on-street parking (City of Kitchener 2007). A wide right of

way is required to accommodate a variety of street functions, utilities and specific streetscape elements such as travel lanes, on-street parking, bicycle lanes and landscaped medians.

Bicycle lanes can provide access to major trails, employment and regional cycle lanes. Ideally, bicycle lanes should be separated from traffic through a tree, stone or concrete division (see Figure 20 proposal), similar to a European design, which would be safer than a painted line in the street. As well, cycle lanes should be dedicated and separated from pedestrians, however neither of these concepts have been incorporated to present day, locally or widespread in North America.

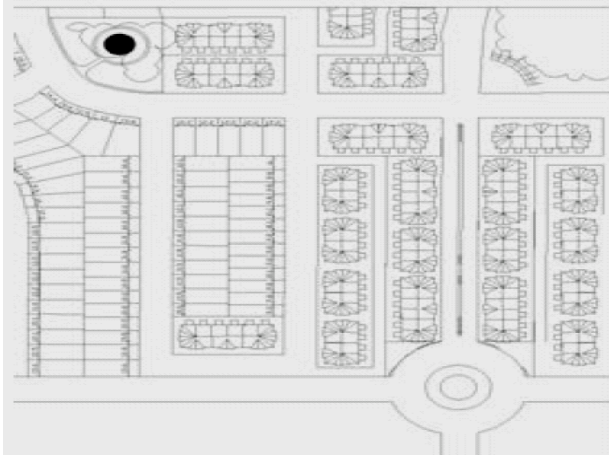
With subdivision design, we also need to consider reduced or narrow rights of way for local streets, or cul-de-sac streets where appropriate.

**Figure 20, Standard Right of Way Street**



Subdivision street planning needs to establish a mix of lot frontages along all street blocks to promote variety and on-street parking opportunities. With a mixture of lots for different dwelling types within a neighbourhood and on a street block. A mix of frontages along streets and individual blocks contributes to interesting streetscapes (see Figure 21), offers housing choice and promotes transit-oriented development (City of Kitchener 2007).

**Figure 21. Mixed Street Frontage**



Source: City of Kitchener (2007)

Another type of street network that consists of those facilities, that are both off street and are dedicated to the non-motorized modes of transportation and some forms of physical activity, include trails and cycle pathways. All of the attributes of urban form have the potential to focus on healthy community design and influence an individual's perception about the desirability of walking, cycling, or engaging in physical activity.

Most features of the built environment constitute design elements (see Figure 22, 23). Unlike the motorist, a person who is walking, jogging, or cycling is unsheltered from the elements, both human and natural. As a result, the individual is influenced by the design characteristics of their immediate surroundings and the cost of other elements that together define the world we inhabit (Frank et al 2003).

Rethinking current suburban street standards is required to create more cohesive, livable urban areas. Street standards may appear insignificant, however they are powerful in the way they shape the environments in which we live. When we think about street design model, neo-traditional street design developments are characterized by somewhat higher densities, mixed uses, provision of public transit, accommodation of the pedestrian and cyclist, with a vision of increased interconnected street patterns.

**Figure 22, Streetscape, Kitchener**



Source: Liptay (2007)

**Figure 23, Streetscape, Waterloo**



Source: Liptay (2006)

Transit Oriented Development (TOD) supports the neo-traditional development in its concern with walkability and convenient access, although there is less emphasis on controlling architectural form or repeating historical style. The design, configuration, and mix of uses emphasize a pedestrian oriented environment and reinforces the use of public transportation. TOD (see Map 7) entails the reshaping of new streets and development to support the pedestrian or cyclist and a reduction of automobile use (Southworth 2001), and is concentrated in mixed use development at strategic points along the regional transit system (Calthorpe et al 1993).

Without any re-direction or re-management of land use patterns and network connectivity, efforts to create imaginable and comfortable streets and neighbourhoods will result in little more than the old suburb in a new style. Local efforts at creating convenient, less auto dependent neighbourhoods and communities will be most effective within a regional framework that provides the transit infrastructure and encourages a denser pattern of development with mixed uses (Southworth 2001).



### Map 7, Transit Oriented Development, Kitchener



Source: IBI (2008)

Land use patterns, in facilitating contemporary transit-oriented development looks at other types of rapid public transit beyond bus transit, as in Light Rail transit. Modern rail technology presents the possibility of a more complex 21<sup>st</sup> century (Calthorpe et al 2001). The Light Rail Transit system is designed to increase public convenience, reliability, speed and comfort to be more competitive with automobile travel, and present a viable transportation alternative. Urban form is affected by the amount of space that an urban transport system absorbs. Automobiles are the most space-intensive form of urban transport ever devised and have forced cities to expand into rural areas. In many cities, attempts to accommodate automobiles required the construction of urban highways that depleted some traditional neighbourhoods (Crawford 2000).

If we replace auto-centric urban transport with a rail-based system, we can retain and even improve our current levels of mobility at a cost both the resident and the environment can bear. The financial cost of rail transit can be rationalized in places that combine land use policy with transit expansion, or where transit ridership has increased or is anticipated to increase with population growth predictions. Efficient street design and network connectivity, paralleled with innovative site design and green infrastructure, are essential to healthy regional growth and neighbourhood revitalization.

## 2.7 Site Design and Green Infrastructure

Well designed and green site design (see Figure 24, 25) improves quality of life for neighbourhood residents. Lively, safe, pedestrian friendly public spaces are important components of healthy, sustainable communities. Site design addresses the quality of neighbourhood areas to support walking and cycling. It includes design and green infrastructure amenities; parks, open space, trails, woodlands, trees, design features that promote physical activity, and also includes crosswalks, sidewalks, short building setbacks.

Neighbourhood areas must be created with interconnected open space system with parks located within walking distance to residences. Providing for a continuous and linked community trail system and cycle way that is clearly marked and does not abruptly discontinue a short distance down the road. Providing small scale parks and park furniture that will encourage physical activity, support mental health and community interaction. Provide plazas or urban squares in key urban areas which are safe and well lit, and have interesting public art to engage pedestrian interest or support a heritage or cultural past.

Through the provincial site plan control process, municipalities can also consider the external design of buildings to improve the physical aesthetics of neighbourhood areas. (Province of Ontario 2007). To achieve a balance between functional and visually pleasing public spaces, streetscape improvements such as landscaping, street furniture, and cycle parking facilities can also be implemented. For greener neighbourhoods and cleaner air, municipalities may consider energy related uses as a component of subdivision proposal, under the community improvement financial incentive program, aimed at encouraging more sustainable types of development (Province of Ontario 2007).

Community improvement plans (CIP) support compact, mixed use and transit supportive development. CIP improves ecological health of neighbourhood areas by reducing emissions and increasing neighbourhood site planning and green infrastructure. Community improvement plans

**Figure 24, Green Infrastructure**



Source: Liptay (2008)

**Figure 25, Site Design, Cambridge**



Source: Liptay (2008)

and site design look at creating communities that have a distinctive character, have pedestrian-friendly streets and prominent landmarks and views. Urban form guidelines can include various community structure, streetscapes and landmarks. Sections of roads can include mature trees, distinctive lighting, attractive landscaping, prominent street gateways, and a safe pedestrian realm.

The quality of the public realm is important for both mental and physical health. The idea of preserving and developing green infrastructure within our neighbourhood areas has positive health effects and make an urban area an enjoyable place to live. Protecting neighbourhood woodlands and parks, conserve the environment and encourage a connection to natural areas. Site design guidelines must clearly outline the preservation of neighbourhood green infrastructure and must be set up to review any consideration of future sale in growth related areas.

Development that takes into account the preservation of existing green infrastructure, and must also ensure that new development complements or incorporates greenspace and heritage resources which are natural, historical, architectural or of cultural significance. Relevant urban form guidelines include; preservation of existing settings, adaptive re-use; rehabilitating a heritage resource, integration of individual components of a heritage resource into a new development; and integration of new, contrasting building materials in a way which respects the integrity of the heritage resource (City of Kitchener 2007).

The impact of the design of public open space on residents for activities like walking is important. It is possible to design and redesign public open spaces for multiples recreational uses, with landscaped trees to create interest, provide opportunities for physical activity and social interaction (Giles-Corti 2006). Neighbourhood urban form greenspace planning needs to establish interconnected open space system through park spaces that include: larger sized neighbourhood parks; smaller size parkettes, green common areas. This system should be integrated with park space, cultural landscapes, lookouts, and urban plazas for planned commercial areas. Urban plazas should incorporate strong elements of green infrastructure aside any solid material block design.

Neighbourhood park space should be located within 400 m walking distance to most homes, preferably as a neighbourhood focal point or between two neighbourhood edges. Increased walking distances may be considered for larger park spaces. Neighbourhood park spaces could be placed at prominent street intersections, near school sites and in close proximity to community trails, along priority streets at shared neighbourhood boundaries. The park spaces should include amenities, playground facilities, seating furniture, art space, landmarks and bicycle racks. These parks should range between 1.0-2.5 ha in size, and be located within a five minute walk of

housing and be visible from the street. Provision should also be made for at least 1 m frontage for every 100 sm of park along public streets (City of Kitchener 2007).

Parks support community engagement by providing residents with a venue for participation in and attachment to their communities. They provide a sense of place and offer essential life-enhancing qualities that aid community and individual well-being. Parks are one of the most effective methods to change the character and improve the image of a neighbourhood community (Francis 2006). It is important to think of parks and greenspaces as places that bring together different kinds of people. It is this diverse mix of people that make urban parks successful. For example, in the City of Kitchener centre core area, one public park success story looks at the revitalization of one of the oldest area parks, Victoria Park, which has gone from a barren safety concern area to a social interacting environment that gathers resident's downtown and encourages an active healthy urban environment.

## **2.8 Relationship between Community Health and Urban Form**

When we think about the relationship between community health and urban form, three immediate factors come to mind that contribute to decreased neighborhood health; poor air quality, lack of physical fitness, pedestrian safety. Each of these factors can be attributed to urban form and the cultural reliance on the private automobile. Addressing these factors requires an evaluation of current development, a redirection in planning and development, new tools and focus on revitalized urban form, supported by alternative modes of transport, increase use of public transit, increased walking, cycling, car-share or car-pool. Ideally, to provide mobility choices that can be incorporated into daily travel usage. While promoting greater choice to encourage healthier living, healthier neighbourhoods and healthier citizens.

Poor air quality is a concern across the province, with southwestern Ontario having some of the most detrimental air quality in Canada. Smog, traffic congestion and sprawl are the

consequences of the way urban areas have been developed, and the decisions made about the form of cities (MAH 2004). Waterloo Region is an active leader in Ontario's economic growth and represents a critical mass of urban activity and regional pressure on air quality. We know that where air pollution is present there will exist chronic respiratory and cardiovascular disease (Health Canada 2005). Health Canada (2005) estimates that 5,900 deaths per year could be attributed to air pollution, based on a study of eight Canadian urban areas, four of which are in Ontario.

The Ontario Medical Association (2005) (see Table 2) illustrates figures for air pollution for Ontario, and Waterloo Region in 2005. The estimate indicates that 5,800 premature deaths were associated with air pollution in Ontario, with an estimated 200 deaths in Waterloo Region. Although Ontario's air quality rates are high, an assumption should not necessarily be made that Ontario has a chronic air quality problem, because these are two independent reports and any analysis would have to be made as to where the other provinces are in terms of health impacts of poor air quality (Public Health 2008). However, the results are significant to warrant concern in relation to health effects associated with air pollution. While considering predicted population

**Table 2** Ontario Medical Association (OMA) health effect estimates associated with air pollution exposure in Waterloo region and Ontario, 2005

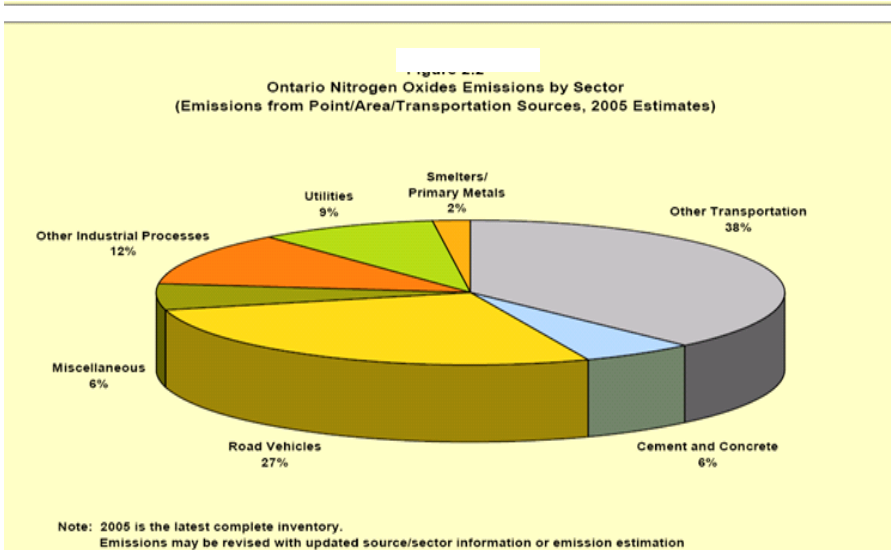
Health effect	Waterloo region	Ontario
Premature death	200	5,800
Hospital admission	660	16,000
Emergency room visit	2,250	60,000
Minor illness	1.2 million	> 29 million

Source: OMA (2005)

growth in the Waterloo Region, these premature deaths are expected to grow to 350 in 20 years if there are no improvements in air quality (OMA 2005).

Exposure to vehicle emissions is associated with hospital admissions and serious health effects (MOE 2006). The Ministry of the Environment (2006) indicates that the increase in NOx concentrations, measured as nitric oxide and nitrogen dioxide, during the morning rush hour alone is mainly created from vehicular traffic. By late morning, ground level ozone continues to be produced as a result of chemical reactions of VOCs and NOx in the presence of sunlight. Figure 26, illustrates the 2005 estimates of Ontario’s NOx emissions from point, area and transportation sources. Transportation sectors account for 65% of NOx Emissions.

**Figure 26, Ontario Nitrogen Oxides Emissions by Sector**



Source: Ministry of Environment (2006)

Air pollution from automobiles is a classic case of a social cost, which includes vehicle externalities like traffic congestion, proven to be a problem for several decades in most cities (OMBI 2006). The urban form challenge with health affect on poor air quality looks at urban areas and how jobs are often dispersed among location and spread out across large single use employment areas such as industrial parks and isolated office blocks. It’s about transportation ‘choice’. Scattered, low density employment areas make transit less cost effective and offers workers little choice other than driving to their jobs (Canadian Urban Institute 2001).

Poor air quality and congestion, both associated with the built environment and private vehicle usage, can also be linked to activity patterns and lack of physical activity in communities. Emerging research provides ways to better understand how urban form and transportation choice influence our choice to walk or our levels of physical activity. Physical inactivity is one of the most common and preventable patterns of behavior. The scientific evidence is strong that regular physical activity such as walking reduces the risk of premature mortality and the development of chronic disease, improves psychological well being and helps prevent weight gain and obesity (TRB 2005).

Moderate forms of physical activity can include productive types of exercise. For example, communal physical activities such as cycling or walking (see Figure 27, 28) can be introduced by changing the way communities are designed to encourage activity and a reduction of private transportation usage. Emphasis should be placed on environmental neighbourhood conditions that encourage or inhibit physical activity and develop activity supportive environments.

The claim is made that walking will increase if the activities of daily living are within walking distance and linked to where people live and work by an interconnected network of streets, sidewalks and pathways (Handy 2002). These goals can be achieved by improving street connectivity. Public transit should increase with more compact land use and clustering of shopping and housing near rail or transit nodes.

When we consider urban design elements and how they can affect how much individuals engage in physical activity and measure healthy neighbourhoods, consideration must also be given to pedestrian or cyclist safety. The mediating variable is the actual or perceived safety of the environment and how it affects an individual's propensity to be physically active or choose alternative forms of transport. Traffic safety for pedestrians can be measured by the number of road crossings to land use, such as school or parks, as an indicator of level of safety for traditional



intersections. Intersection safety can be measured by the ratio of ‘T’ to ‘X’ intersections, with ‘T’ intersections shown to be safer, although roundabouts (see Figure 29) exceed intersection safety.

**Figure 27, Cycling Trail**



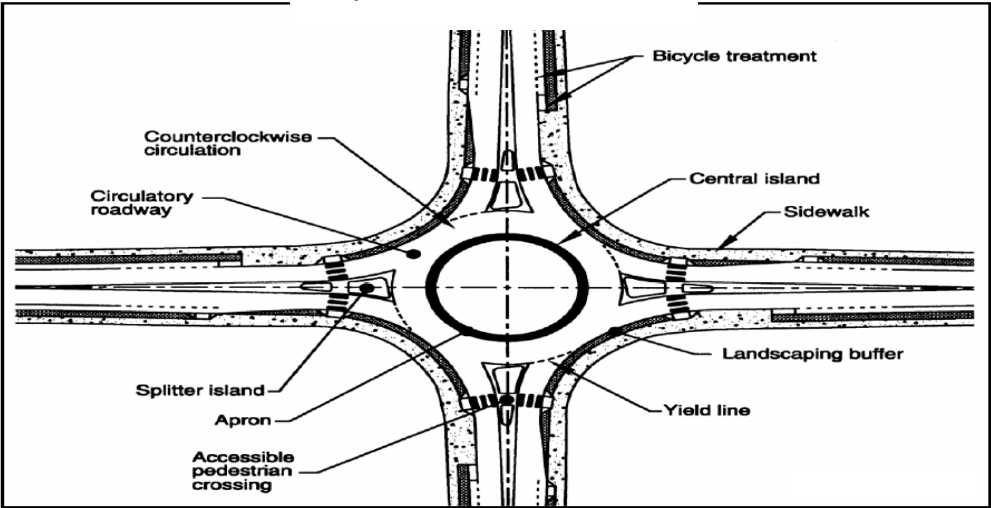
Source: City of Kitchener (2008)

**Figure 28, Walking Route, Kitchener**



Source: Liptay (2007)

**Figure 29  
Key Roundabout Features**



Source: City of Hamilton (2008)

Suburban sprawl leads to increased traffic, which leads to increased accidents and fatalities, for motorists, pedestrians and cyclists (Bray et al 2005). In 2007, the Region of Waterloo reported a total of 5980 traffic collisions that occurred on local regional roads or signalized intersections.

The number of vehicle collisions for 2007 was 5980, pedestrian collisions 122, cyclist collisions 128 and intersection collisions 57% (Region of Waterloo 2007).

The numbers are significant and support policy to reduce traffic speed, incorporate design of pedestrian and cycle paths, narrow streets, and implement roundabouts or traffic islands to reduce traffic speeds. Much of the unsafe behavior is caused by certain roadway design features rather than poor judgment. Wide streets, in both residential and commercial areas, lead drivers to want to go faster and attract greater traffic volumes. They have long crossing distances, as well as wide turning radius, multiple turn lanes, or confusing traffic controls, all of which create unsafe environments (Morris 2006). Analyzing the land use planning potential and its impact on community safety and health requires a policy context.

## **2.9 Land Use Planning Policy Context: Regional and Municipal**

The land use planning policy context at the Regional and Municipal level takes into account the provincial *Smart Growth* approach to land use planning that promotes a concentration of development, diversity of uses, efficient urban design and alternate transportation planning. It includes existing planning concepts and zoning capabilities, usually used to counteract single-use zoning, suburban sprawl, separation of residential and commercial uses, and an auto dependant lifestyle.

A range of related planning policy at the Regional level include: *Regional Official Policy Plan (2009)*, *Regional Growth Management Strategy (2003)*, *Master Transportation Plan (2009)*, *The Station Area Plan Pilot Project (2008)*, *Regional Energy Model and Emissions Reduction Plan (2008)*, *Air Quality and Human Health Impacts (2008)*, *Cycling Master Plan (2004)*, *Pedestrian Charter (2005)*, *Cultural Heritage Landscapes (2005)*, *Human Services Plan (2009)*.

At the Municipal level, *Growth Management Strategy, Design and Development Plans, Core Revitalization Plans, Residential Streetscapes Report, Height and Density Policy Plans, Community Development Plans, Heritage and Environmental Strategic planning*, to list a few.

These government planning policy take into account local design and development, heritage and environmental planning, and incorporate Smart Growth with the intent of reducing sprawl, preserve open space, focus development in the centre core areas and encourage mixed use communities. Related policy looks at revitalizing existing urban centres and older communities, reducing new greenfield development, but also in planning better design in newer communities through interconnected streets, diversity, and a focus on pedestrian street level scale, emphasizing walking and mass transit.

The regional and municipal initiatives are intricately linked. The regional focus indicates responsibility in the areas of: public health, overall planning for patterns of growth and development, regional roads, traffic signals and signage, public transit and specialized transit. Primary municipal area responsibilities include: local planning, zoning and neighbourhood planning, minor variances and land severances (regulated through the Planning Act), industrial development, building inspection and permits, local streets and sidewalks, parks and recreation, as well as bylaw enforcement for land use issues.

At the Regional level, growth policy and plans are based on a vision for a sustainable regional community. The *Regional Official Policy Plan of Waterloo Region (2009)* examines six elements within the community growth context: environmental integrity, planning growth, economic vitality, partnerships internal and external to the community, public participation, and safe and healthy communities. It recognizes planning at the individual, community and neighbourhood level (Region of Waterloo 2009).

Aligned with the *Official Policy Plan (2009)*, the Region of Waterloo's *Regional Growth Management Strategy (RGMS) (2003)* provides direction for long-term management of growth within Waterloo Region over the next several decades by employing a balanced approach to future planning goals: enhancing the natural environment, building vibrant urban places, providing greater transportation choice, protecting the countryside line, fostering a strong economy, ensuring coordination and communication. The RGMS has a positive impact on local neighbourhoods, travel modes throughout the community, and local air quality.

The RGMS correlates several provincial initiatives including; *Ontario Smart Growth (2005)*, the province's vision for promoting and managing growth that build strong communities and promote a healthy environment. The *Provincial Policy Statement (2005)*, a review by the Provincial government of land use planning policies; the *Municipal Act (2003)* that provides municipalities with more planning flexibility and authority. The *Brownfield's Statute Law (2001)*, an Act designed to encourage the remediation and redevelopment of Brownfield sites.

The Region of Waterloo's *Transportation Master Plan (RTMP) (2008)* responds to steady growth in the community that recognizes the efficient movement of people and goods as having an increasingly important and challenging issue. The RTMP includes a long range of comprehensive transportation strategy for the Region that would identify opportunities to encourage a shift in mode use away from auto, maximize investment in the existing infrastructure, and identify opportunities for improved infrastructure to achieve Regional land use, transportation, planning objectives and policies.

The RTMP plan responds to the requirements of the Provincial Growth Plan ('transit first') and reflects local sustainability (Region of Waterloo 2008). The Regional Transportation Master Plan (2008) indicates key issues relating to growth in the Region with transportation related concerns that focus on how the public want to see their community develop and how they want to

travel around the Region. The Plan includes an auto use reduction program, transportation demand management/transit oriented development, transit services, cycling and pedestrian initiatives, major transportation planning projects and proposed priority projects.

An area of emphasis is how land use planning fits into transportation planning. Land use planning decisions are currently made at the local level, however these decisions also have a direct impact on regional transportation i.e. urban sprawl promotes intensive automobile use, which produces air pollution and health detriments.

In this, there is a need to address the externality problems of poor air quality in suburban neighbourhoods. Single use, dispersed neighbourhoods, located far from downtowns, produce nearly three times more annual emissions per household than mixed use compact neighbourhoods near downtown. Within the same location, developing more compact neighbourhoods with mixed use and pedestrian oriented design decreases greenhouse gas emissions by 24-50% (CMH 2000). Environmental regulations aim to produce cleaner air in most urban areas with some success in emission concentrations (Ministry of the Environment 2006).

The *Region of Waterloo 2007-2010 Strategic Plan* illustrates improvements in air quality within Waterloo Region and makes effective use and management of our energy resources (Region of Waterloo 2007). The Region's Public Health division contributes to this by developing these areas through: *Community wide air quality monitoring and modeling program*, *Anti-idling social marketing campaign*, and *Community Energy Planning Strategy* which includes community design for more efficient energy use (Region of Waterloo 2008).

Regional Public Health Air Quality plans concentrate on the population's health best served by communities designed to encourage more walking and cycling through a Pedestrian Environment plan that discourages automobile use. The *Region of Waterloo Pedestrian Charter* (2005) addresses principles of individual environmental health and well being, to create an urban

environment that encourages community health, vitality and safety in physical fitness and the increased public transit use. Regional health and built environment studies continue to make recommendations for the design of communities based on health needs.

Upper tier municipalities (countries and regional/district municipalities) as well as planning boards deal with broad land use planning use that concern more than one local municipality. Some of these upper-tier municipalities have their own official plans and have the power to approve local official plans, in place of the Minister of Municipal Affairs and Housing. Some upper-tier municipalities are also the approval authority for plans of subdivision. In some areas of the province, municipalities in one or more counties, with the approval of the Minister, may constitute a municipal planning authority to do joint planning to address common issues on managing growth and providing services.

At the Local level, the municipality makes the local planning decisions that will determine the future of communities. It prepares planning documents such as the Official Plan which sets out the municipality's general planning goals and policies that guide future land use. Zoning by-laws set out the rules and regulations that control development as it occurs. The municipal level ensures that planning decisions and planning documents are consistent with the *Provincial Policy Statement* (2005) that conform or do not conflict with provincial plans. The Official Plan at the upper, lower or single tier municipal council policies determine how land in the community should be used, as well, provides a framework for establishing municipal zoning by-laws to set local regulations and standards, like the size of lots and heights of buildings (City of Kitchener 2009).

The challenge within the regional and municipal land use planning policy context remains how these plans and decision making have a direct impact on urban form and the health of communities. How will increased population growth in the Region affect the load on public land

use design and services, and which policies will have the greatest impact on our Region's atmospheric emissions levels. Official plans determine the creation and maintenance of sustainable land use systems within a policy framework in the context of local, regional and provincial policies. Developing efficient land use planning that will provide residents with an ability to choose different modes of transport, while reducing the impact on the health of citizens and communities.

## **2.10 Public Health Reports: Fisher (2005), McCormick (2006), Schumilas (2007)**

The Region of Waterloo has published three public health reports that support healthy population growth within the context of the healthy community, and efficient land use planning. Each report explores how elements of the built environment, including urban design, reurbanization, transportation, housing, and rural land use, affect the individual's abilities to adopt healthy behaviours and ultimately determine a community level of health. That being said, health results are additionally impacted by other socioeconomic factors such as genetics, environmental, lifestyle, food intake or other demographics.

Fisher's (2005) 26-page report, *Urban Form, Physical Activity and Health*, took the form of a public health telephone survey of 1029 residents conducted by Ipsos Reid. Standardized questions were asked from the Canadian Community Health Survey, which include health indicators and basic demographics used for the survey. The survey focused on health and neighbourhood design, walking, automobile use and addressed specific ways in which urban design impacts public health and quality of life. The key points within this study state that public health disease such as obesity and asthma are linked to community design, while demonstrating that inner city and suburban neighbourhoods have different urban design levels of physical activity, walking rates and health indicators associated with their respective urban design.

The Fisher public health report (2005) results indicate that the centre core study areas have a higher level of residents walking during the week over suburban residents (see Table 3).

**Table 3, Walking Rates, Inner-city Vs. Suburban Neighbourhoods**

	<b>Inner-city Neighbourhoods</b>	<b>Suburban Neighbourhoods</b>
Average # of days per week walk	5.0a	4.1a
Average minutes of walking per day	47.7	41.1
% who walk for leisure	78	79
% of time spent on purposive walking doing errands	49.2a	33.5a

(a) represents a statistically significant difference ( $p < 0.05$ ) between two neighbourhood types. Sample 1029 residents.

Source: Fisher (2005)

Participants from inner-city neighbourhoods spent significantly more of their time walking doing errands and getting from place to place. Alternative transportation methods were also used more frequently in the centre core neighbourhoods, such as cycling, car-sharing or car-pooling.

Suburban residents walk more for recreational reasons and on weekends. Suburban residents drove private automobiles more than the centre core residents, and used public transit to a significantly lesser degree (Fisher 2005).

This aligns with the Travel Patterns Survey (Fisher 2005), which states that respondents from inner-city neighbourhoods are significantly less likely to own, rent or lease a vehicle (2% versus 14%) (see Table 4).

**Table 4, Travel Patterns, Waterloo Region 2005**

	<b>Inner-city Neighbourhoods</b>	<b>Suburban Neighbourhoods</b>
Average distance to work or school (km)	16.8	20.1
Average time it takes to travel to work/school (minutes)	21.3	22.0
% who drive to work/school	68a	86a
Average number of minutes per day spent driving in a car (minutes)	42.0a	73.8a



% who use Grand River Transit to get to work/school	6	5
% who walk to work/school	18a	8a
% who cycle to work/school	8a	2a
% who do not own/rent/lease any vehicles	<b>14a</b>	<b>2a</b>
% who own/rent/lease more than two vehicles	9a	23a

(a) represents a statistically significant difference ( $p < 0.05$ ) between two neighbourhood types. Sample 1029 residents  
Source: Fisher (2008)

The Fisher report (2005) provided an overview of public health impacts related to walking. The study provided a glance at six Region of Waterloo neighbourhoods, and included an environment and walkability scale, which provided an overview on walking, cycling, automobile use, food intake and health concerns. The survey focused on ways in which urban design impacts public health and quality of life. The report is useful as a preliminary study on health impacts related to physical activity.

Subsequent to the 2005 Fisher report, Public Health Waterloo Region, released a study by McCormick (2006), *Compilation of Data Relating to Urban Neighbourhoods in Waterloo Region*, which assessed neighbourhood variability, based on socioeconomic characteristics and their influence on selected health diseases (i.e. asthma, cardiovascular disease, cerebrovascular, selected respiratory illness, unintentional injuries, sexually transmitted disease, suicide and self inflicted disease) and Early Development Instrument (EDI) domain scores. Socioeconomic factors within the study included: post secondary education, immigrant percentage, population age, income, and employment rate. Indicators looked at total population and population density size. The neighbourhood area within the Waterloo Regional report included a wide range in seventy-two regional neighbourhoods.

The McCormick 2006 Report is extensive in supporting data, and is noted here only to present that this research demonstrated that low socioeconomic status can affect the health of an individual and neighbourhood health. Exploring the importance of neighbourhoods as a factor in

individual health is relevant. While there are limitations in the interpretation of neighbourhood similarities and differences of the residents who live there, these studies provide valuable insight at the neighbourhood level (McCormick 2006).

While the thesis research does not address any causality with health outcomes, it is important to note that key points within the McCormick neighbourhood health variability report on seventy two Regional neighbourhoods study presented a higher proportion of health diseases in the suburban neighbourhood areas in relation to the centre core neighbourhood areas. Results demonstrated that the centre core neighbourhood areas were the healthiest neighbourhood areas. These results of the McCormick report closely align with the 2005 Fisher report. The health diseases noted were diseases normally related to a lack of physical activity and reliance on an auto-centred society; asthmas, cardiovascular, respiratory, unintentional injury (including motor vehicle accidents).

Public Health Waterloo Region released an additional report by Schumilas (2007), *Healthy Growth: Health and the Built Environment in Waterloo Region*. This report illustrates the potential impact of growth on population health, addresses chronic disease, air quality, health disparities between neighbourhood health, and the impact of community planning on health outcomes. The report presents a clear message that community planning and the aspects of the built environment also have a significant impact on health (Schumilas 2007). While the 'built environment' refers to buildings, roads, fixtures, parks and other structures that form the physical character of a place. A built environment also incorporates reurbanized mixed use, and complete communities, transit oriented development with a focus on active transportation, and the preservation of rural food lands, increasing physical activity, improve food access, improving air quality and enhancing the development of social capital. Taken together, these improvements purportedly help to reduce health disparities within communities.

The Schumilas 2007 report recognizes that a healthy community is one that focuses on the interplay between people and their surroundings, and takes steps to modify the built environment in ways that make healthy options easier and mitigate harmful outcomes. The healthy growth report address five key focus areas to slowing the escalation of local chronic disease and reducing health disparities: one, increasing physical activity through urban design improvements; two, improve air quality by focusing on emissions from local energy and fuel consumption; three, increase social capital in neighbourhoods by influencing the built environment; four, improve food access and intake; and five, strengthen rural health by improving local farm viability (Schumilas 2007).

These recent public health reports highlight the partnership between regional, local and municipal levels in an effort to influence land use policy working towards sustainable growth and change. To do this effectively requires manageable urban form financing.

## **2.11 The Economics of Urban Form**

Healthy and livable communities are sustained by cost effective financing, to reduce land consumption and service costs, affecting development and revitalization of urban form. Regional and local governments often make creative use of existing municipal financial tools to encourage new development i.e. through grants and loans, community improvement plans (CIP), tax increment-based financing, or other alternative financing tools; site-value taxation, land-value capture taxation, or municipal fuel taxes.

The Province of Ontario provides tax incentives that favour urban form development in Smart Growth principles, such as reducing property and sales tax on new construction on brownfill sites, the revitalization of existing developments in urban areas, intensification and the redevelopment of underutilized lands and buildings including parking lots and vacant buildings, which removes incentives for urban sprawl. As well, the Province provides financial assistance

for supporting urban form development through the expansion of regional public transportation systems and other alternative transportation modes (Province of Ontario 2009).

Provincial grants and loans recently matched with growth infrastructure include: August 2009, the Ministry of Transportation announced the Ontario Transportation Demand Management (TDM) Municipal Grant Program for 2009-2010, to provide financial assistance to Ontario municipalities for the development and implementation of TDM initiatives, which includes a maximum funding of \$50,000 per project, funded for up to one year (Environmental Registry, Province of Ontario 2009). In 2009, the Ontario Ministry of Health also developed a new framework for building healthy communities in Ontario and presented the Healthy Community Fund that replaces the former Communities in Action Fund. The HFC fund focuses on increasing physical activity within communities and looks at programs that address health risk factors (Ontario Ministry of Health 2009).

In 2008, the Ontario government set aside \$1 billion for new municipal infrastructure projects, including \$400 million for roads and bridges outside the GTA area. In 2007, \$33 billion in renewed infrastructure program referred to as the Building (Build) Canada Plan was used for large scale infrastructure renewal such as rapid transit (MEI 2008). In 2006, Move Ontario, invested 1.2 billion into public transit, roads and bridges. \$838 million of this investment was set aside for public transit. In 2005, \$30 billion 5-year infrastructure investment plan, ReNew Ontario, introduced to cover financial support for municipal areas in health care, economic prosperity; transit and transportation. \$313 million in the gas tax program went to support municipalities in expanding and improving their public transit system.

Community Improvement Plans (CIP) are provided under the Planning Act's Community Improvement provisions (Section 28:4:0.1) that allow for Tax Increment Financing, based on municipal grants and loans. Tax increment financing is done by calculating a grant or loan on the

higher property tax that is generated from development (the tax increment). Through this, municipalities can offer developers financing incentives that will put lands and building that might not otherwise be developed back into production (MAH 2009). It is largely a tax used to revitalize blighted urban areas, usually in the downtown area. Municipalities can then designate an area or entire municipality as a community improvement project area, then implement the CIP calculated on the tax increment basis. What is required as a preliminary to this process, is that the municipal Official Plan Policy make referral to the CIP project area through a formal by-law.

For example, within the Region of Waterloo, the 2007 Brownfields Financial Incentives Program included four components; environmental site assessment grant, regional development charge exemptions, development of a tax increment grant and the community improvement plan (to implement the tax increment grant program). The Brownfields Financial Incentive Program encouraged the rehabilitation and redevelopment of local brownfield sites to promote intensification and reduce any outward movement of urban area in support of the Regional Growth Management Strategy, as supported by the Places to Grow Growth Plan (2006) and the Provincial Policy Statement (2005).

This Region's financial pilot program generated interest when an initial \$2.5 million was provided for the program in the approved budget (Region of Waterloo 2007). The Joint Tax Increment Grant Program includes both Regional and Area Municipalities, including the City of Cambridge/Region of Waterloo and the City of Kitchener/Region of Waterloo.

Through Smart Growth initiatives, with anticipated higher population and employment density in the centre core, municipal taxes can be sustained. Where sprawl continues, development pays through special development taxing. The municipal operating budget largely includes the property tax, which works adjacent to municipal user fees and government grants.

The necessary trend over the past decade has been to increase the property tax as a primary municipal revenue source.

On the capital budget, cities use all of these revenue sources plus borrowing. Developers pay levy charges on growth related capital costs. The instruments used to raise revenues affect the nature and location of development. Development charges (development cost charges, development cost levies, development levies, off-site levies or assessment levies) cover the growth-related capital costs associated with new development, or re-development. These charges provide municipalities with revenues to finance growth-related infrastructure needs.

Alternative financing tools include; site-value taxation, land-value capture taxation, and municipal fuel taxes. Site-Value taxation is taxation of the land only portion of a property; the assessment base excludes any improvements. Land value capture taxes (land-value increment taxes, betterment levies, or valorization taxes) are levied to capture the increase in commercial value created as a result of a major public investment in infrastructure. For example, if a municipality is considering a major infrastructure investment, like light rail transit, a tax could be imposed on the neighbouring property that would benefit from the new land value.

Municipal Fuel Tax revenue is generally allocated for local road and transit services (Howe 2002). Although it is a user pays tax, it is viewed as a benefits-based tax. As for its impact on urban growth patterns, some analysts think that a tax on fuel discourages the use of automobiles, reduces the demand for commuting and may increase the demand for more compact development (Nivola 1999).

To summarize, to reduce the costs associated with urban form development or redevelopment, it is necessary to use both planning tools and financial tools. The impact of smart financing on urban growth patterns is significant. A combination of user fees based on marginal costs and development charges levied on each development basis could encourage efficient land

and infrastructure use and result in developments located closer to existing services (Howe 2002). Through economic tax incentives, development and revenue financial support, there can be an assurance that strong provincial and municipal funding for smart planning and developing healthy communities takes place.

Economic viability requires an ability to adapt to change, to take advantage of opportunities and strengths, to identify and fulfill unmet needs.

To further provide for this support and comparative analysis for creating healthy communities through urban form, and in the Region of Waterloo, the next section will provide an overview of six additional municipalities within Ontario, to examine what healthy urban form policy or development design guidelines exist and are being implemented within those communities.

## **2.12 Comparative Ontario Municipalities, Urban Form Guidelines**

### **Overview Analysis**

A comparative analysis of Region of Waterloo healthy community form and development design guidelines with other Ontario municipalities, assists to explore and link the varied communities together in meeting the provincial Smart Growth mandate. An overview of sample municipal urban plans identifies “best practices” in urban form and development design policy and practices. In this chapter, an overview of the following urban communities: Brampton, Burlington, Guelph, Markham, Milton, and Mississauga.

The results of the comparative municipal analysis (see Table 5) indicate that all six communities, similar to the Region of Waterloo municipalities, are on board with already having developed Official Policy Plans for Urban Form and Development Design, or are in the process of refining these guidelines. Overall, each community placed a higher focus on strategic design plans for downtown areas, as mandated by the province’s intensification goals. As well, the

majority of municipalities also present urban form guidelines for specific area neighbourhoods. A higher level of focus was placed more on new neighbourhood development and less on redevelopment of already existing neighbourhoods, again in line with the Provincial urban core intensification mandate.

Throughout each municipality, there was an increasing consciousness of designing neighborhoods with healthy built form and streetscapes. Of the sample municipalities in review, the city of Mississauga (see Table 5) clearly presented the most extensive array of City Centre and area specific urban form and design guidelines and policy, with specific overall community design policies for new and existing subdivision development. The Region of Waterloo closely compares to this high quality of guidelines and policy required for healthy urban form.

### **Brampton, Ontario**

The Brampton Official Plan for Urban Form/Development Design review (2005) implemented a number of changes, specifically in the way the City looks at urban form and civic design. Based on the new direction that the city has taken in this, it has introduced new policies and programs, i.e. Block planning, the City-wide Development Design Guidelines and the Flower City Strategy, and the Central Area Plan Review (City of Brampton 2005).

The City of Brampton's urban design policies in general include city-wide, neighbourhood and downtown areas. The urban policies allow for conditions of design guidelines, focusing on neighbourhood parks hierarchy and open space provisions, as well as residential porches, roofs and architectural details. Leisure and Recreation design are included in the Master Plan, while parks provisions include off-street parking design.

Brampton has made a commitment to a high quality public realm, high civic design standards and high quality physical development. The intent is to strengthen the role of urban design in planning as an essential city building ingredient clearly stated in the Official Plan, while



the Official Plan should apply to both private and public sector developments. Brampton’s new city urban design requirements include sanctioning block planning and the city wide development design guidelines to form part of the urban design policy framework. Improving presentation of the ‘community/site design’ and ‘element specific’ policies are also proposed.

In the City of Brampton, specific proposed changes to the urban form section of the Brampton official plan include: general urban form principles (diversity, open space, preservation, scale, safety (see Figure 30), human services, land use compatibility to name a few); element specific design principles (gateways, landmarks, open space, park form (see Figure 31), and natural features, views and vistas, public art); and other design considerations (signage, parking, roofscapes, utilities, buffers, energy conservation, residential streetscapes).

**Figure 30, Street Network Roundabout**



Source: City of Brampton (2008)

**Figure 31, Park Form, Brampton**



Source: City of Brampton (2008)

**Burlington, Ontario**

The City of Burlington presents urban design policies and design guidelines for new communities, which include general policies promoting efficient and attractive urban form, neighbourhood character and functional design.

Burlington provides a thorough examination of key structural elements of downtown urban design, including downtown assets, primary study precincts. The vision is in redefining the downtown core. Examining redevelopment urban design principles, identifying strategic locations, focus on the public realm as an open and civic space, with connections and linkages to other areas, display of public art; and recognition of the private realm through heights and massing, relationship with the street, streetscape (see Figure 32), using contemporary materials and character (Burlington 2005).

The City of Burlington has some unique structuring areas to consider in its urban form planning: Brant street, Lakeshore Road, the Waterfront, Residential neighbourhoods, Key intersections, City Hall, the Art Centre.

Burlington's proximity to the waterfront (see Figure 33), similar to Cambridge, Ontario, presents a unique opportunity to engage waterway character and walkways for residents, including ongoing plans for pier development. In the centre core of Burlington there exist extensive underutilized and vacant sites that could provide redevelopment and revitalization opportunities (City of Burlington 2005). Key characteristics in the central core remain in its positioning as the central node of the downtown, a focal point, which relies heavily on a stable and healthy adjacent residential area, tied by the connectivity of the strong grid road system.

Burlington has formal plans to renew neighbourhood districts, recognizing a pedestrian environment, parking accommodation, residential compatibility and streetscape quality with lakeshore frontage.

**Figure 32, Streetscape**



Source: City of Burlington (2005)

**Figure 33, Pier Development**



Source: City of Burlington (2005)

## **Guelph, Ontario**

The City of Guelph's development planning is evolving. New city land use policies, complement a growing urban population, resulting in new development downtown. In 2008, Guelph made provisions for new downtown development, included the new City Hall, an Inter-Modal Transit Station and a future Public Parking Deck on Wilson street. Guelph maintains a strong connective to its historic past in its Armoury and Market Place, while new downtown guidelines include the Civic destination (City of Guelph 2008).

The City of Guelph's future urban growth will occur in its built-up areas, primarily downtown, where the Market Place is intended to change substantially. The areas south of market Place, on both sides of the Speed River, will be able to accommodate thousands of new residential units, as well as other mixed use, office and employment uses through the redevelopment of underutilized land and abandoned industrial sites (City of Guelph 2008).

Guelph's urban design guidelines focus on developing neighbourhoods with a sense of place and varying character. Creating a hierarchy of open space based on providing city wide plans or specific neighbourhood plans, implementing unique features in safety landscape and effective street network (see Figure 34). It recognizes natural areas (see Figure 35), within the

Strategic Plan to include a pedestrian environment, with emphasis on parks located within a 5-10 minute walk.

For the City of Guelph, priority objectives in strategic urban design plan for the downtown area specifically include; creating a signature civic square for flexible use and enjoyment all year round, providing an expansive setting for civic and cultural events and daily shopping and dining that includes the square and public realm, and establishing an accessible, safe, attractive and efficient multi-modal transit station.

**Figure 34, Barrier Free Median**



Source: City of Guelph (2008)

**Figure 35, Park Scape, Guelph**



Source: City of Guelph (2008)

### **Markham, Ontario**

The Town of Markham urban form and development design guidelines highlight local neighbourhood and community development. The design guidelines are city wide and focus on built form and healthy streetscape (see Figure 36), while attention is also on managing traffic and parking issues.

Markham's Urban Design Concept Plan (2003) forms the most recent planning basis which provides key principles: development of a main street along the southern segment of Old Kennedy Road, Residential uses north of Victory Avenue and mixed uses south of Victory Avenue, a new

centrally located park centered around an existing woodlot (see Figure 37), urban building form and densities throughout the area, and on street parking in place of front yard parking.

New subdivision design guidelines examine enhanced pedestrian activity, provide a sense of place, ensure ecological sustainability and increased mixed use density housing (see Figure 38). All meet a growth population increase over the last 10 years of 45%, with a current population of 223,000 residents. Markham's urban form guidelines look at supporting efficient public transit and delivering a financial framework to support new plans. Emphasis is on the transportation plan which includes new local roads to create a fine grained and more connected road network, helping to shape and improve mobility (Town of Markham 2005).

The Town of Markham's Milliken Main Street has been designated as a Community Improvement Project (CIP) Area under the Official Plan, to reinvigorate the underdeveloped or rundown area. The CIP will enable the town to use planning tools as land expropriation, remediation or rehabilitation. The Milliken Main Street Secondary Plan serves as a framework for redevelopment and intensification in existing built-up portions of the Region's urban area. It makes efficient use of land, provides a wider range of housing and employment opportunities for residents, enhances existing infrastructure, and provides a community-focus for the surrounding area (Town of Markham 2005).

**Figure 36, Transit Supportive High Density Development**



Source: Town of Markham (2007)



**Figure 37, Protective Park Space**



Source: Town of Markham (2007)

**Figure 38, Pedestrian Streetscape**



Source: Town of Markham (2007)

### **Milton, Ontario**

Milton anticipates considerable urban development and redevelopment in its future and has established policies and guidelines to ensure that new development is attractive, well planned and integrated with surrounding development (Town of Milton 2007). Milton's urban form and development design guidelines include:

- Create a sense of civic identity and pride through a high standard of urban design for all new development
- Encourage the integration of new development areas into the fabric of the existing community
- Encourage the development of public spaces that foster community involvement and interaction
- Build on the strengths of the urban and rural character
- Encourage the maintenance and enhancement of the character of existing and well established neighbourhoods (Town of Milton 2007).

The Town of Milton urban form policies focus on road design, gateways, views and landscape design. The park hierarchy is used as a guide for Secondary Plan areas, and provides a high level of parkland provisions. Neighbourhood parks are a minimum of 3 ha which includes sports fields, and provides for good open space connections.

Milton has several objectives to achieve these goals. The Official Plan provides nine strategic objectives to implement these: general design guidelines, road design, parking, microclimate management, view preservation, barrier-free access, public art and landscape design. The new design policies will require guidance on how the exterior building design

elements will be considered in the context of specific urban design guidelines prepared for a Secondary Plan or in a node or corridor. The new Official Plan will also define what ‘sustainable design features’ are. These features could include: transportation shelters, bicycle racks, waste bins and vegetation plants.

Milton has also endorsed a Transit-Oriented Development Policy Review as a planning framework designed to integrate transit infrastructure with land use planning. Transit oriented development will encourage development in transport choice: cycling, walking, “non travel” through mixed use development and high quality public transportation, in addition to the automobile. The town experiences a challenge in extending north-south corridors as far north into the urban area as possible through redevelopment projects in the area.

The plan also identifies Major and Minor Nodes for the application of transit oriented development policies. Major Nodes are the GO Station Planning Area and various main intersections, while minor nodes include minor intersections. While nodes and corridors are included in the Official Plan, there is also a need to include appropriate urban design polices to provide the basis for development and redevelopment with them. Milton in this regard, recommends that policies be established to: control the massing, articulation and placement of buildings at intersections; establish how much of the first storey wall faces a street at the site of openings; regulate minimum and maximum heights as appropriate, have regard to adjacent land uses; and control the placement and aesthetics of parking garages, transit stations and related infrastructure, commercial uses, drive through service facilities and open spaces (Town of Milton 2007)

Milton makes specific mention in its Urban Form and Design guidelines (2007) to value the character of stable residential neighbourhoods (see Figure 39, 40, 41), to meet the Provincial Policy Statement (2005) in meeting a full range of housing types and densities, to encourage

intensification in parts of built up areas that have existing or planned infrastructure to create a supply of new housing units. This also calls for detailed design criteria to determine intensification compatibility, including: relationship between massing and heights of existing and proposed building, location of established building lines (the average setback of existing development from the street), the placement of existing and proposed buildings on a lot, lot coverage of existing and proposed development, nature of existing and proposed building materials, and the location of driveways, garages and trees.

Residents within the Town of Milton have also requested ‘view protection of the Niagara Escarpment’ as a defining feature of the Town. The Official Plan considers this in the preservation of important Escarpment views, although the Plan also recognizes that not everyone is ‘entitled’ to a view, that there needs to be a balance between protecting views and providing opportunities for development (Town of Milton 2007).

**Figure 39, Wide-shallow Lots & Tree Frontage**



Source: Town of Milton (2007)

**Figure 40, Gateway Features**



Source: Town of Milton (2007)

**Figure 41, Front Yard Streetscape**



Source Town of Milton (2007)



## **Mississauga, Ontario**

The City of Mississauga has extensive and detailed urban form policies and urban design review. These include: City Centre Urban Design Guidelines, Design Guidelines for Industrial Buildings, Streetscape Guidelines (Huronontario Street Matheson Blvd. to Hwy 401, Design Guidelines for High Density Apartments, Streetscape: City Centre Area, Streetscape: McLaughlin Road, Eglinton Avenue West to Britannia Road West, Urban Design Guidelines, Design Guidelines for Automobile Service Stations, Car Washes and Accessory Uses.

These include specific Community Design policies provided under the Urban Design plans. New Secondary plan areas include policies regarding urban design. The policies are area specific as to the type of development i.e. multiple dwellings, arterial streets and street network (see Figure 42). The Parks and Recreation Master Plan includes a clear park hierarchy and identification of recreation facilities and size of the future parks required, generally 1.2 ha per 1000 residents.

Mississauga City Centre Urban Design Guidelines that supplement the City Centre Secondary Plan, have the general goal of developing high intensity (see Figure 43), mixed-used city centre with a distinct identity, serving as the cultural and civic focus for Mississauga and as the major commercial centre for the region. The City Centre is intended to attract a high level of social activity both day and night and to create a strong sense of identity through distinctive architectural themes and a superior quality of detailed design at street level. While the Secondary Plan encourages social interaction by allowing mixed-use development and providing for public and private open space, further elaboration of the policies is needed to encourage social and business activities on the streets. The question of appropriate physical form to engender a "high level of social-activity" and a "lively, attractive street oriented frontage" is pursued in these guidelines (City of Mississauga 2009).

The Design Guidelines outlined in this document relate to urban design principles from the City Centre District Policies of City Plan. They are intended to promote an integrated and high quality built environment.

While the guidelines address built form models for a mature City Centre, interim phases of development have a fundamental role in realizing the longer term vision for the City Centre. A conceptual development plan may be requested to address principle issues such as built form, vehicular or pedestrian access and circulation, open space components, parking and servicing.

**Figure 42, Curb Extensions & Crossings**



Source: City of Mississauga (2007)

**Figure 43, High Density Streetscape**



Source: City of Mississauga (2007)

The conceptual plan may change over time given market forces and new opportunities or constraints affecting the site. The Urban Design plans include: pedestrians in the streetscape, public real-streets and boulevards, parking and garage design in the streetscape, signage in the built environment, urban design priorities for the built environment, transit in the streetscape, visibility and informal surveillance, built form in the streetscape, vehicles in the streetscape (City of Mississauga 2009).

**Table 5, Comparative Municipal Healthy Community Form Guidelines**

<b>Urban Area</b>	<b>Urban Form / Design Guidelines</b>	<b>Scope &amp; Purpose</b>	<b>Example</b>	<b>Neighbourhood &amp; Road Network</b>	<b>Green Infrastructure &amp; Pedestrian Environment</b>
<b>Brampton</b>	Brampton Official Policy Plan for Urban Form/Development Design 2005	Focus on Urban Form and Civic Design  New subdivisions	Block Planning  City Wide Development Design Guidelines  Flower city Strategy  Central Area Plan	<ul style="list-style-type: none"> <li>▪ Detailed residential porches, roofs and architectural guidelines</li> <li>▪ Hierarchy of neighbourhood parks and open space</li> <li>▪ Street network streetscape plan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Element specific design principles (gateways, landmarks, views, vistas, art)</li> <li>▪ Other design (signage, parking, roofscape, buffers, residential streetscape)</li> <li>▪ Neighbourhood parks in secondary and block planning</li> <li>▪ Connectivity important</li> <li>▪ Parks located on arterial streets or intersections</li> <li>▪ Park every 400m</li> <li>▪ Parks remain focal part of neighbourhood area</li> </ul>
<b>Burlington</b>	Urban Design policies, design guidelines for new communities, and neighbourhood function and character definitions	<ul style="list-style-type: none"> <li>▪ General policies promoting efficient attractive urban form</li> <li>▪ Promote neighbourhood character</li> <li>▪ Functional design guidelines for new communities</li> </ul>	Specific structure areas: Brant St, Lakeshore Rd, the Waterfront, Residential neighbourhoods, key intersections, City Hall, art centre  New communities design plans	<ul style="list-style-type: none"> <li>▪ New communities (i.e. Alton, The Orchard)</li> <li>▪ Specific structure areas of design guidelines</li> </ul>	<ul style="list-style-type: none"> <li>▪ Parks serve various neighbourhood areas</li> <li>▪ Natural features plan</li> <li>▪ Recognize central downtown node</li> <li>▪ Pedestrian environment and park development</li> <li>▪ Future Pier development</li> </ul>

<b>Urban Area</b>	<b>Urban Form / Design Guidelines</b>	<b>Scope &amp; Purpose</b>	<b>Example</b>	<b>Neighbourhood &amp; Road Network</b>	<b>Green Infrastructure &amp; Pedestrian Environment</b>
<b>Guelph</b>	<p>Policy &amp; Guidelines for Urban Form and Design 2008</p> <p>Strategic Plan Urban Design Plan for Downtown</p>	<ul style="list-style-type: none"> <li>▪ Strategic Urban design plan for downtown</li> <li>▪ City wide design guidelines</li> <li>▪ Focus on urban design framework</li> <li>▪ Specific Civic Square, Parking Lots, Transit Stations</li> <li>▪ Streetscape improvement plan</li> </ul>	<p>Guelph Market Place Strategic Urban Design Plan May 2008</p> <p>Civic Square (front of new City Hall and Provincial Courts) 2008</p> <p>Wilson Street Parking Lot (mixed use structure) 2008</p> <p>Inter-Modal Transit Station (Carden Street) 2008</p>	<ul style="list-style-type: none"> <li>▪ Urban design for Neighbourhood Character and a Sense of Place</li> <li>▪ Create a hierarchy of open space based City wide or neighbourhood specific plan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recognize and connect natural areas</li> <li>▪ Pedestrian environment plan</li> <li>▪ Open space areas based on size, function and population served</li> <li>▪ Parks located with 5-10 walk</li> <li>▪ Adequate street frontage recommended</li> </ul>
<b>Markham</b>	Urban Design Concept Plan 2003	<ul style="list-style-type: none"> <li>▪ Neighbourhoods and community development</li> <li>▪ Design guidelines city wide with built form and healthy streetscapes</li> </ul>	<p>Specific area design guidelines</p> <p>Old Kennedy Rd S. Victory Ave N. Victory Ave S. Central Park</p>	<ul style="list-style-type: none"> <li>▪ Transform hwy 7 into an urban boulevard</li> <li>▪ Manage traffic and parking issues</li> <li>▪ Neighbourhood character and quality design</li> <li>▪ Specific area community design plans</li> <li>▪ Design implementation through site plan control and subdivision agreement</li> </ul>	<ul style="list-style-type: none"> <li>▪ High visibility of parks to encourage usability</li> <li>▪ Parks within a 5-10 minutes walk</li> <li>▪ Natural features adequate signage</li> <li>▪ Enhanced pedestrian activity</li> <li>▪ Sense of place</li> <li>▪ Ensure ecological sustainability</li> <li>▪ Increase mixed use density housing</li> <li>▪ Public transit plan</li> </ul>

Urban Area	Urban Form / Design Guidelines	Scope & Purpose	Example	Neighbourhood & Road Network	Green Infrastructure & Pedestrian Environment
<b>Milton</b>	Urban design policies and guidelines for new development Official Plan	Urban design policies focus on road design, gateways, views, landscape design  17 Objectives, 9 Strategic Objectives in Design Guidelines	Official Plan 17 objectives, 9 strategic objectives General Design Guidelines  Road Design, Parkland	<ul style="list-style-type: none"> <li>▪ General design, road design, parking, view preservation, barrier free access</li> <li>▪ Transit Oriented development</li> <li>▪ Major &amp; Minor Nodes Policy</li> <li>▪ Road design and parking</li> <li>▪ Sustainable design plan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Park and landscape design</li> <li>▪ Minimum 3 ha neighbourhood park, with sportsfield</li> <li>▪ Open space connections</li> <li>▪ Sustainable design features</li> <li>▪ 4 ha per 1000 people</li> </ul>
<b>Mississauga</b>	Extensive City Centre and area specific urban design guidelines and policy	City Centre urban design guidelines  Design Guidelines for Industrial buildings  Streetscape specific guidelines  Design Guidelines for high density  Streetscape for city centre  Streetscape for specific areas	Specific community design guidelines  New secondary plans as to type of development i.e. multiple dwelling, arterial street, streetscape  View presentation, barrier free access, public art, landscape design	<ul style="list-style-type: none"> <li>▪ Specific community design policies New secondary plan areas include policies regarding urban design</li> <li>▪ Subdivision/Development</li> <li>▪ Addresses built form, vehicular/pedestrian access and circulation, open space, parking, servicing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Parks and Recreation Master Plan</li> <li>▪ 1.2 ha per 1000 residents</li> <li>▪ Detailed park hierarchy</li> <li>▪ Identification of recreation facilities</li> <li>▪ Future parks provision</li> <li>▪ 1.2 ha per 1000 residents</li> <li>▪ Centrally located parks within 800m of homes</li> </ul>

Source: Liptay (2009)

## 2.13 Key Findings and Conclusions: Literature and Existing Policy

The literature review made use of extensive data research which provided descriptive information and study analysis on healthy communities and land use planning. Existing planning policy provides the context with which to address change through the *Smart Growth* concept. Key findings within the literature review recognized that effective land use and efficient urban form policy can encourage healthy practices and healthy community design, while meeting increased population and community growth.

The research defines ways in which urban form affects public health and quality of life within communities in promoting a healthier lifestyle. Throughout an examination of neighbourhood design, the research examines physical structural areas: block size, street connectivity, population density, closeness of amenities, where the neighbourhood provides accessibility for physical activity. The research recognizes that infrastructure, and the quality of our surroundings and the built environment have immense physical impact on the well being of individuals and neighbourhood development.

The challenge is to put into place urban form which influences physical activity. Active transport includes walking, cycling and other non motorized vehicles, and has been identified as a strategy to increase community physical activity levels while producing other environmental and social benefits (Giles-Corti 2006).

Beyond re-design of new and existing urban form areas, part of the problem can relate to reliance on the private auto, which decreases air quality, reduces physical fitness, impacts efficient land utilization and environmental protection. The research examines air pollutants, in particular, nitrogen dioxide, and how it transforms in the air to form gaseous nitric acid and organic nitrates, how it plays such a critical role in atmospheric reactions that produce ground-level ozone, a

component of smog, and places community health at risk. The research documents early urban form development, evolution of the automobile within land use, and how conventional suburban street layout evolved from plans of early cities and suburbs, shaped by the current city planning to the explosion of city growth.

The three public health reports, *Urban Form, Physical Activity and Health*, Fisher (2005), *Compilation of Data Relating to Urban Neighbourhoods in Waterloo Region*, McCormick (2006), and *Health Growth: Health and the Built Environment in Waterloo Region*, Schumilas (2007), each present a descriptive view on health interacting with land use planning, demonstrating that inner city and suburban neighbourhoods have different urban design levels of physical activity and health indicators associated with their specific urban design.

Ewing (Ewing et al 2003) indicated that there are relationships between sprawl areas and lower levels of physical activity due to the reliance on the automobile, and higher rates of obesity and hypertension. The Ontario College of Family Physicians in their *Report on Public Health and Urban Sprawl in Ontario* (2005) argue that the sprawling patterns of urban growth had led to a greater reliance on automobiles for transportation which discourages walking and physical activities, and leads to health problems due to increased smog and air pollution.

The fact remains that residents who move into more walkable neighbourhoods will shift some trips to transit, bicycling and walking as a result (Krizek 2000). People living in sprawling low density areas walk less, weigh more and are more likely to be obese or have healthy problems than people living in compact communities (Ewing et al 2003).

*Healthy Communities, Sustainable Communities, A Call to Action* (OPPI 2007) recognizes that our built environments are not addressing emerging public health issues sufficiently which results in a less than optimum human environment. A 2007 study (Glazier et al 2007), *Neighbourhood Environments and Resources for Healthy Living: A Focus on Diabetes in Toronto*, a study on

Toronto neighbourhoods, examined living factors that could influence disease, such as physical activity, access to healthy food and access to transit. The research supports the notion that where people live has a significant impact on their health. Neighbourhoods that are more activity-friendly (and encourage healthier food choices) have a favourable effect on resident's health, including the risk for health disease, such as obesity and diabetes (ICES 2007).

The Toronto study supports other studies connecting health outcomes with urban design, which includes Canadian surveys such as Health Canada (2005), estimating that 5,900 deaths per year could be attributed to air pollution, based on a study of eight Canadian cities. Pikora (Pikora et al 2003) examined urban design and walking in combination with qualitative inquiry to develop a model of environmental factors that influence walking and cycling at the neighbourhood level.

There is strong evidence that the built environment affects the transport-mode choice. A growing body of evidence confirms that neighbourhoods characterized by low density, poorly connected street networks, and poor access to shops and services, are associated with low levels of walking and that urban sprawl or low physical activity is connected with obesity and other health diseases (Giles-Corti 2006).

There have also been a large number of studies done in the area of health impacts derived from traffic emissions which include asthma hospitalization, impaired lung development in children, adverse birth outcomes, and premature mortality. Roewade (2006) presents that traffic emissions often dominate air pollution levels within 50-200 meters from major roads and highways in terms of human exposure. The Provincial Health Database (2005) recognizes that sensitive groups of individuals, children under the age of eighteen, older adults over sixty-four, are impacted with cardiovascular or respiratory disease, with a link to air quality environmental pollutants. Bray et al (2005) notes that the effects of air pollution and greenhouse gas emissions



on respiratory disease, cardiovascular disease, reproductive health and some cancers can be linked to exhaust toxicants. The lack of physical access in a community also becomes a factor leading to more illness and even mortality (Ontario College of Family Physicians 2005).

Another potential impact of urban form on public health relates to a sense of community and mental health. The World Health Organization estimates that by 2020, mental ill health will be the third leading cause of disability. This has sparked interest in the impact of the urban form on mental health, particularly through its impact on the development of social capital or sense of community (WHO 2003).

The sum of these impacts on public health supports a change in public policy toward more livable communities (Bray et al 2005). The research suggests that we concentrate on enhancing quality of life for residents of urban communities through effective urban form and land use policy. By putting into place specific infrastructure to reduce reliance on fossil fuel use and providing alternative public transport choice. Policy needs to incorporate redesign of neighbourhood land use patterns at a regional or local scale that addresses a smaller pedestrian scale, physical design of pathways and streets, incorporate safety, aesthetics, and invite physical activity into neighbourhood parks, local activity centres, walkways, and cycle routes with increased public transit use.

Existing Regional and municipal policy supports the province's *Smart Growth* concept and integration with transportation and land use decisions, encouraging compact, mixed use development within existing urban areas and discouraging dispersed auto dependent development, protecting the environment, building stronger, healthier communities. Local policy plays a significant role in shaping the health and well-being of community residents. A healthy community is one that recognizes the interplay between residents and their surroundings and take steps to modify the built environment in ways that make healthy options easier.

Urban form planning that incorporates efficient street design and environmental modes of transportation, while maintaining relationships among land use density and mixed use, will encourage opportunity to use alternative modes of travel. Regional progress continues to be made in air quality policy by managing air quality through local monitoring, however policy also needs to examine how higher auto dependent residential densities and neighbourhoods close to highways and arterial roads deteriorate air quality.

While policy to encourage physical activity within neighbourhoods designed with pedestrian friendly policy will contribute to neighbourhood communities that are more efficient and healthy. The examination on effects of urban form and land use planning on health is relevant given the current political and public interest in land use issues, sprawl and environmental issues in Ontario.

### **3 RESEARCH METHODS**

#### **3.1 Research Question and Research Design**

The research topic, ‘Creating healthy communities through urban form’, asks the research question, ‘what are the attributes of a healthy community’? It imparts a descriptive evaluation of a complex range of the built and social environment, and healthy communities, utilizing quantitative and qualitative methods.

The research design indicates the arrangement of conditions for the collection and analysis of data that supports the research question. The type of research design used within this research is descriptive research. Descriptive research portrays the characteristics of an individual, situation, group, or sample population, and presents a systematic description of the phenomena and the context in which it occurs and is called for. It asks, how often the phenomena or its variants occur? Who is involved? How the variables that were identified as important are distributed in the population? What are the processes by which it is produced? The goal in descriptive research is to adequately represent the phenomena of interest as it occurs in the population of interest (Palys et al 2008).

Essentially, descriptive research takes a “what” approach (as in ‘what are the attributes of a healthy community’). It provides answers to the questions of; what, who, when, where and how. In the research, the design will seek to measure ‘attributes’ as in ‘variables within the natural neighbourhood setting’. It will measure ‘how’ as in ‘how the people conduct themselves in the neighbourhood area’ (as in ‘primary private vehicle use’); as well as ‘what happens’ (as in ‘limited physical activity’). The strengths of this research design are that it presents an opportunity to study behavior in natural settings which makes results applicable to the larger

population. It makes use of description as a tool to organize data into patterns that emerge during analysis (McNabb 2009).

Descriptive research design was administered in order to portray the characteristics of the neighbourhood communities, to determine whether the quality of effective urban form planning can be measured through quantitative and qualitative data. In the quantitative realm, emphasis is placed on minimizing bias, maximizing the representativeness and/or thoroughness of the sample (hence the results) and ensuring that the measures are reliable and valid. The reliability and validity of the measures are processed through psychometric testing. The quantitative data administered the key informant neighbourhood questionnaire, observational recording in the natural context through GIS mapping and digital photography, and additional multiple sources of data.

In the qualitative realm, descriptive research addresses reliability and validity by looking for multiple sources (and triangulation) and identifying key informants. Qualitative data was presented through open key informant interview dialogue, oral questionnaire and observation. Data gathered from the research methods was then summarized for interpretation. The initial fieldwork results were entered into a database that characterized healthy neighbourhoods and verified the extent to which the eight study neighbourhoods conformed to these criteria. The research determined where individuals embraced healthier lifestyle and behaviors within the neighbourhood areas and where specific land use criteria promoted or discouraged this.

Limitations on descriptive research design include; a selection bias (the group selected may affect results), a placebo effect (power of suggestion, observer bias or participant influence), or experimental bias (preconceived notions or expectations). As well, large scale research can be costly and time consuming. Additional threats to validity include instruments used in data collection, or history of the area being researched.

## **3.2 Benefits and Disadvantages of Quantitative and Qualitative Research**

### **3.2.1 The Quantitative Approach**

The quantitative approach is a natural science model and can be recognized as an empirical tradition known as positivism (Palys et al 2008). Positivism expresses the ideas that the world consists of phenomena which is based on reality and usefulness, and that knowledge exists in the description of the coexistence of successes of these phenomena (Bhaskar 1986). Positivism looks at discovering the realities, the facts. It examines causes and effects and looks at external observable forces considered 'real' (Palys et al 2008).

The disadvantage of the quantitative approach is the need for the researcher to maintain objectivity to the study through social distance. That is, to remain external to the research observation and not become involved on any emotional or experimental level.

The independent (causal) variables are the social facts. In the idea that aspects of social life that individuals do not create will continue to operate despite any emotion toward this. An example of social facts looks at social practices and institutions i.e. education, religion, law, the economic system. These casual variables exist and influence us all. The dependent (outcome) variables are the aggregated data. To measure the effects of some facts we rely on official real data i.e. birth rates, crime records. This data deals with matters relevant to and affected by social facts, are outside the influence of the researcher, and make it easy to compare two areas, or an area over time (Palys et al 2008). Quantitative approach prefers the deductive method, making predictions and asserting success in an ongoing process.

### **3.2.2 The Qualitative Approach**

Qualitative research focus rests on a human-centered methodology, understanding human behavior. The philosophy that expresses this view is known as phenomenologism, which upholds

that any effort to understand human behavior must take into account the thought that humans are cognitive beings who actively perceive and make sense of the world around them, have the capacity to observe from their experience, add meaning to their behavior and are affected by this (Palys et al 2008).

Qualitative research argues that any science of human behavior is trivial or incomplete unless it takes people's perceptions into account. This research approach rejects the idea that statistical criteria can define explanation or understanding. Instead it involves an understanding of human actions and interpretative meaning to the subject. Qualitative research believes that understanding perceptions requires 'getting to know' the research participant, to offer empathy or concern, to understand that validity requires intimacy (Palys et al 2008).

There are disadvantages to qualitative research, in that the subjectivity of the inquiry might lead to difficulties in establishing the reliability and validity of the approaches and information. It is also difficult to prevent or detect researcher induced bias. While its scope is limited due to the in-depth, comprehensive data gathering approaches required (Palys et al 2008).

The inductive case study approach supports the view that researchers should listen to their subjects on an analytical understanding. This approach takes the form of observation in the field or case study analysis. The quantitative approach attempts to understand the study on its own terms and then guides a general theoretical concept. The phenomenologist perspective is known as constructionism which looks at objective knowledge and truth as something created, not discovered by humankind. Emphasis is on the pluralistic character of reality, that reality is shaped to fit acts of human intentions. Qualitative research understands the effects of something, only if we understand the context in which it occurs and people's perceptions of it.

Quantitative research tends to emphasize the measurement of outcomes in research i.e. causes and effect. The research considers the world a more transient place contingent on meaning and understanding, with more attention to processes and implications (Palys et al 2008).

### **3.3 Pros and Cons of Specific Research Methods Used**

The research question ‘what are the attributes of a healthy community’ is critically reflected on, and provides a descriptive evaluation of the relationship between land use form and health. Although it could be quite broad, one way I have investigated it is through in-depth observation in field visits, key informant interviews and key informant questionnaire with a small and focused sample of neighbourhood representatives, and planners. This allowed me to maximize time and collect results in a reasonable period of time, but also provided a window into specific neighbourhood behaviours and lifestyle practices.

#### **3.3.1 Observation**

Observation-based research relies on the impact of the research process in the field work experience and the data it produces. The social research technique involves the direct observation of phenomena in their natural setting. It is based on the premise that the process can be observed, recorded, documented, analysed and written about. In this sense, observation needs to be an active process, the researcher observes the setting or group by being present in the study environment, sharing the physical experience of the environment, observing behaviours and practices, facilitating the material into recordable research data, enhanced by digital photography or video (Nightingale 2008).

Observational research tends to be less reliable but often more valid. The main advantage of observational research is flexibility. The researcher can change approach if required. The main

disadvantage to observation as a research method is that it is limited to behavioral variables. It can not be used to study cognitive or affective variables, while it is not usually generalizable (Palys et al 2008). In all observation-based research, the power of the researcher is constrained by ethical and legal requirements, permission and rules.

Throughout the evaluation of the neighbourhood study, observation was used to examine the study areas, noting behaviors and actions, patterns and themes, describing study variables. Observation assisted the researcher in understanding additional phenomena that was occurring, and included various tools: GIS mapping of each neighbourhood, a written record of land use analysis for specific urban design criteria, digital photography of area urban features (record of specific criteria unique to each area later implemented into GIS mapping of the physical environment), and a record of travel behavior mode use of area subjects.

The GIS maps were commissioned through the Region of Waterloo Planning, Housing and Community Services division cartographic team. All maps were generated using Arc Map (ARCGIS 9.0). The neighbourhood maps with overlays were designed specific for this study, Census Planning District boundaries were based on 2006 Census Canada populations, while Clair Hills had a recent amended boundary change. The GIS maps include primary characteristics observed in the field work research, with urban form overlays in formal trail location, cycling route, greenspace elements; wooded areas, parks or waterways, transit information, including precise placement of bus transit stop locations, rails, recreational facilities. As well, the maps indicate area road system design, density and varied land uses.

Observation took place by means of eight neighbourhoods within Waterloo Region, which included five suburban and three city core neighbourhoods, including two newer suburban areas to provide results for newer contemporary urban design. Six of the eight neighbourhoods were selected specifically to align with the Fisher (2005) interim report, and seven study



neighbourhoods for the subsequent McCormick (2006) report, (the eighth neighbourhood had independent socioeconomic research provided by Public Health in 2008). This provided a continuum of study, with emphasis on neighbourhood behavior, form and alternative modes of transport systems. The specific neighbourhoods were also chosen as areas that were more likely to experience future change based on existing growth management plans.

The initial anticipation of results from the observation of the study areas was that the subject behaviors and neighbourhood characteristics would indicate that the centre core neighbourhood areas were, by virtue of their physical land use design, intensification and travel behaviors, more likely to embrace physical activity and transportation alternatives that lead to healthier lifestyle, and therefore present healthier neighbourhood form.

### **3.3.2 Key Informant Interviews**

The Key Informant Interview, as a qualitative research method, provides the researcher with knowledge, based on the informant's position or relevant experience within the community. Community representatives, with their background knowledge and understanding, can provide insight on the nature of area scenario or problems and give recommendations for solutions (UCLA 2009), as well as develop the researcher's knowledge on the subject. Often the key informant interview can complement data collected from other sources. The interviewer must be careful to assess personal perspective on the issues, so that any particular view can be taken into account (Gratton et al 2004).

There are two common techniques used to conduct the key informant interview: telephone interviews or face-to-face interviews. More information is gathered in a face-to-face interview in comparison to a telephone interview format. Within the interview method, either a structured or semi structured interview can take place. The structured interview consists of a list of specific

questions. The interviewer does not deviate from the list or inject any extra remarks into the interview process. The interviewer may encourage the key informant to clarify vague statements or to further elaborate on brief comments. Otherwise, the interviewer attempts to be objective and tries not to influence the interviewer's statements. The "unstructured" interview is more open, allowing the same questions as in the structured interview, with a free-flowing style. The researcher may adjust the questions according to how the key informant is responding and may inject opinions or ideas in order to stimulate the interviewee's response.

The "content" of the interview is 'what' the interviewee says. The most accurate way to record interview data is to take notes of the content of the interview or use an audio recorder (Suler 2009). Steps in conducting a key informant interview include: establishing rapport, introducing yourself and being professional, describing the research project, asking permission to record the interview, obtaining informed consent through the written consent form, proceeding with the interview, ending the interview within the time limit set aside, while finalizing the interview with a thank you letter.

The interview method used in the neighbourhood study research includes a caution with limited interview participant numbers, which must be taken into consideration of any bias, commentary or results. The context of the interview process was primarily to gather opinion. The key informant interview positions are supported by a number of Regional, community wide surveys and focus groups presented within the report. The key informants included one neighbourhood representative from six neighbourhood associations, one neighbourhood recreational representative (no formal neighbourhood association), and six representatives chosen at random (through personal contact) in one newer suburban neighbourhood (with no formal neighbourhood or recreational association). Thirteen key informant interviews were taken from the neighbourhoods. As well, the interviews included four urban planners from the Region of

Waterloo in the division areas of; public health, transportation demand management, transit/transportation planning, and community services planning. In total, seventeen (17) key informant interviews took place (N=17). The number of key informants required for a key informant interview study largely depends on your data needs, available time and resources. Typically, 15-25 key informant interviews are used (UCLA 2009).

A socioeconomic profile of the research key informants within the neighbourhood areas reflected the higher percentage of socioeconomic factors noted within specific neighbourhood study results. This includes: Clair Hills, Waterloo: key informant; female, age 25-35, non-visible minority, married with young children, post secondary graduate university educated, higher income, owner occupied dweller. Mary Allen, Uptown Waterloo: key informant; female, age 55-65, non-visible minority, married with older children, semi-retired local business owner, post secondary graduate educated, moderate-higher income, owner occupied dweller. Westvale Meadows, Waterloo: key informant; male, age 35-45, non-visible minority, married with middle-aged children, employed, post secondary graduate, middle income, owner occupied dweller. Civic Central Frederick, Kitchener: key informant; male, age 40-50, non-visible minority, marital status not determined, middle-aged children, employed, post secondary graduate, moderate income, owner occupied dweller.

Country Hills West, Kitchener: key informant, female, age 56, non visible minority, divorced, employed, post secondary college, lower-middle income, owner occupied dweller. Laurentian West, Kitchener: 6 randomly selected key informants, 4 females and 2 males, age range 25-45, majority single or divorced and mid-age to older children, 1 married with young children; 5 employed, 1 homemaker, post secondary education range from high school diploma to university educated, lower to middle income, all rental dwellers.

Central Park, Cambridge: key informant, female, 60 years, non-visible minority, divorced, adult children, employed, post secondary graduate, lower income, renter. Shades Mills, Cambridge: key informant, female, 40-50 years, non-visible minority, married with older aged children, employed, post secondary graduate, middle-higher income, owner occupied dweller.

The research key informant interviews took the semi structured format and used two separate questionnaire outlines; one for the neighbourhood representatives, and another for the planners (see Appendix). Written notes were taken along with three recorded audio tapings, when permission was provided. The required consent forms were signed and followed standard university ethics approval process. Interviews took place in the interviewee's homes, local coffee shops, and workplace. Interview participants were consulted to participate in the interview in the summer of 2007 and throughout early 2008. To recruit interviewees, participation was invited by email, telephone or personal visit, which included various tools; initial invitation letter, consent form, feedback and thank you letters (see Appendix) outlining the purpose of the research study, with ethics board review and approval.

The key informant interview method took the form of a face-to-face interactive interview which provides a high response rate, any opportunity to clarify questions or expand on the answers. The formal questionnaire outline was followed, with a semi-structured format. The majority of the interviews maintained the thirty minute time frame. The interview subjects appeared engaged in the process, wanting to share their experience and portrayed an interest in the overall study.

Advantages of the Key Informant Interview include: detailed and rich data that can be gathered in a relatively easy and inexpensive way. It allows the researcher to establish rapport with the key informant and clarify questions. It provides an opportunity to build or strengthen

relationships with important community informants and stakeholders. It can raise awareness, interest and enthusiasm around an issue.

Disadvantages with Key Informant Interviews include: selecting the ‘right’ key informant may be difficult as they represent diverse backgrounds and viewpoints. It can be challenging to reach and schedule interviews with busy or hard to reach respondents. And, it may be difficult to generalize results to the larger population unless interviewing many key informants, and therefore there may be limitations in participant numbers. The researcher must also be aware of any ‘reactive bias’ in the interview process, as in leading the interviewee on, or offering personal comments or reaction to what the interviewee is saying. The face-to-face interview method might also present the participant with some pressure to answer the questions truthfully, given that anonymity is less evident, unless confidentiality is requested at the time of the interview.

The key informant interview method was selected for the research study as it proved to be an effective method in which to gather first hand qualitative responses from neighbourhood representatives that represented the majority of the neighbourhood association opinion within that specific community area. The research method provided the researcher with a general understanding that straightforward answers would be provided to the key informant questionnaire outline, in gathering direct information about the neighbourhood area. Additional supporting materials such as neighbourhood association minutes, newsletters, or local city or regional council minutes generally supported this data.

### **3.3.3 Key Informant Questionnaire**

The key informant questionnaire is another interactive method that can be incorporated into the key informant interview process, and provides direction for the question and answer dialogue between the researcher and the key informant. In general, there are three different types of key

informant questionnaires that can be determined. These include the self-administered questionnaire, where the researcher makes face to face contact with a single respondent who completes the questionnaire themselves, and where the researcher may or may not be present; the group-administered questionnaire, where a group of individuals are brought together to complete individual questionnaires in each other's presence, under the researcher's supervision; and the mail out questionnaire, where there are no personal instructions or explanations to the respondent than appear on the questionnaire itself. The contemporary computer based equivalent survey questionnaire is also another consideration.

Similar to the interview face-to-face interview, the key informant questionnaire can be administered more effectively in this manner, with a higher response rate. Mail out and telephone questionnaires have a substantially lower response rate between 10% to 40%, compared to 80% to 90% for interview surveys.

Within the study research method, the cross-sectional key informant questionnaire included standardized questions adapted, in part, from annual Statistics Canada Health surveys to ensure validity and reliability of the questions, and allowed comparison of findings with that of other health surveys (Fisher report 2005, McCormick 2006, Schumilas 2007). The key informant questionnaire was carried out, and included prepared questions (see Appendix) related to; specific neighbourhood urban design, structural areas, block size, street connectivity, population density, transportation modal choice, commuting behavior, private vehicle use, existence of trail or cycle paths, road type design, public transit accessibility, convenience and use of amenities, views on alternative modes of transportation, neighborhood cohesion, land use type and neighbourhood safety. A standardized script with thirty three questions was used to collected data during each session.

Part two of the key informant questionnaire data collection included a similar format of questionnaire direct toward Region of Waterloo planners in the division of: Public Health Planning, Transportation Demand Management Planning, Transit-Transportation Planning, and Community Services. The Planner interview questions focused on; local urban design, specific to neighbourhood design, transportation alternatives or community policy, effectiveness and implementation of public transit, rapid transit, public health, air quality, provincial growth policy. A standardized script with sixteen basic questions (see Appendix) was used to collect data during these sessions. Data from the key informant questionnaire was used to create a Data Table which examined and outlined environmental factor indicators between the neighbourhood area, with descriptive on centre core areas and suburban criteria, population density and travel behaviors.

The advantages or strengths of the key informant questionnaire is that it easily offers the respondent anonymity if requested. It is an effective way to amass a lot of data quickly, and is inexpensive. Structured questions make for easy data coding and compilation.

Disadvantages or limitations in key informant questionnaire method include: a certain level of comprehension or literacy is required to complete a questionnaire; vocabulary must be appropriate for a full range of respondents, and the researcher's data is limited to what's on the paper.

## **4 OBSERVATION, KEY INFORMANT INTERVIEWS AND KEY INFORMANT QUESTIONNAIRE**

### **4.1 Healthy Neighbourhood Urban Form**

The healthy community concept seeks to improve quality of life; offering benefits; promoting physical activity, improving neighbourhood air quality, lowering the risk of accidents and maintaining safety, increasing social connections or a sense of community, while reducing any negative environmental affects.

Given complex identities, the healthy neighbourhood community maintains some essential common traits: pedestrian friendly and has a mix of uses, network street connectivity, efficient site connectivity and design, appropriate density, a clearly defined public world, and a reasonable range of housing types. The ideal neighbourhood unit has 1,000-5,000 residents, appropriate density of 120 families per acre, a one kilometer walk rule, interior street connections along transit routes spaced 60-70 m blocks (City of Kitchener 2007), cycle routes, pedestrian paths and trails with a 400-500 m walking radius, central common and greenspace, shopping facilities, churches, library, community center located near schools, accessible public transit (Rosenblatt 2005).

Urban form at the neighbourhood scale looks at a scale of development that is larger than a city block or individual subdivision development, but smaller than a community which includes a variety of neighbourhoods and supporting land uses (City of Kitchener 2007). There are essentially two types of neighbourhoods, central neighbourhoods located in the central part of the city, and suburban neighbourhoods, located at the outer portion of the city.

The central or center core neighbourhood includes downtown or uptown areas. Center core neighbourhoods are generally older areas with mature treed boulevards, a grid or modified grid street pattern, shorter block lengths, housing diversity and easy access to local amenities. All



central core neighbourhoods within the Region of Waterloo are evolving through adaptive re-use and infill development projects. The suburban neighbourhoods are located outside the city central area, include greenfield areas, and have greater variation in terms of scale, form and function.

Many of the underpinnings of strong neighbourhoods and pedestrian community have been lost in postwar planning development characterized by high motor vehicle dependence, segregated land use, disconnected streets, low residential density and limited public transport and local employment (Giles-Corti 2006). The negative externality is declining community health and the rise of attributable diseases from lifestyle choice and community patterns.

We need to reinvest in the health of neighbourhood communities and return to basic urban design ideas; diversity, human scale and preservation as the key to urban form vitality. Some individuals believe that the idea that the auto oriented suburb is sustainable or universally desired is no longer conventional wisdom (Calthorpe et al 2001). Today, urban plans with open space systems and transit oriented development are being adopted, while the result can be a rejuvenation of a sense of place that forms the spirit of neighbourhoods and communities.

## **4.2 Waterloo Region Neighbourhood Study Overview and Public Health Published Study**

The thesis research provides a descriptive evaluation of eight neighbourhoods within the Regional Municipality of Waterloo, Ontario (see Map 8), with an examination of older and newer neighbourhoods, suburban and centre core areas. The Waterloo Region neighbourhoods are defined as Census Planning Districts and include current 2006 Census Planning District populations. These include, from the Waterloo area: Clair Hills (Waterloo West), Mary Allen Uptown (Central Waterloo), Westvale Meadows (Westvale). Kitchener neighbourhoods include:

Country Hills West (Country Hills), Laurentian West, Civic Central Frederick (Central Frederick); Cambridge neighbourhoods include: Central Park, and Shades Mills (Shades Mill North & South).

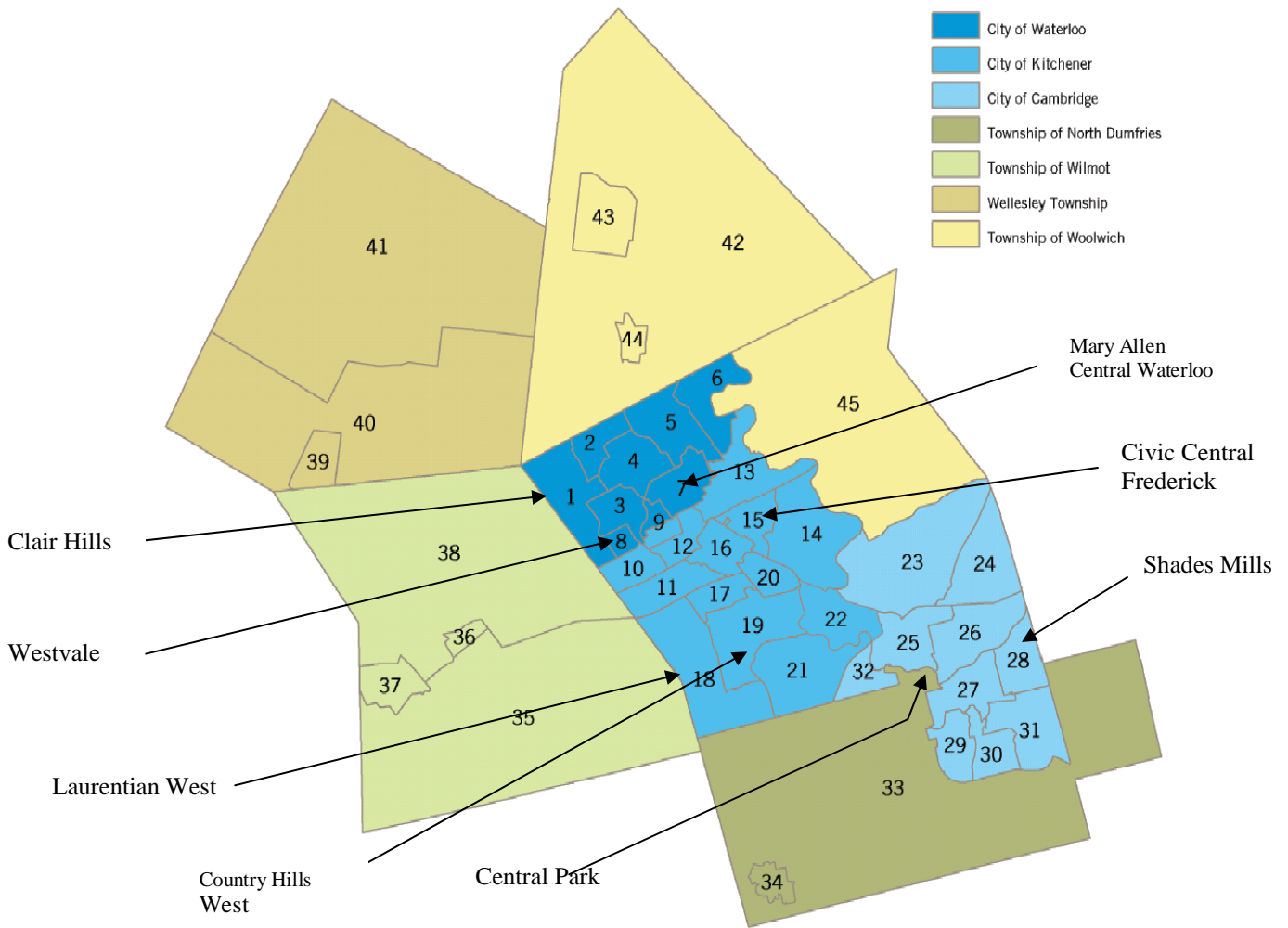
The eight neighbourhoods were selected specific to align with the two public health reports, *Urban Form, Physical Activity and Health* (Fisher 2005), and *Compilation of Data Relating to Urban Neighbourhoods in Waterloo Region* (McCormick 2006). The Fisher report included six of the eight neighbourhoods within the thesis research, which provided a continuum of study of walkability and health, with particular emphasis on criteria that characterizes healthy neighbourhoods through urban form and transportation alternatives.

The specific neighbourhoods were selected as neighbourhoods likely to undergo future change in local growth management. The thesis research study included two newer suburban neighbourhoods in the research; Laurentian West, Kitchener, and Clair Hills, Waterloo, to provide an analysis of newer planning policy or design implementation in relation to older suburban design.

Neighbourhood study demographics profiled the suburban neighbourhood areas as having a higher number of families with school aged children, with a higher average income than those in the inner-city neighbourhoods. The inner-city neighbourhoods were profiled as having fewer people in the household, with an older average age and more retired people, although a younger generation is also purchasing re-use loft residences. A comparison of the 2006 Census Planning District population data with 2001 Census Planning District population indicated steady or decreased density numbers within the centre core neighbourhood districts. Suburban neighbourhood districts maintained density with the exception of two areas, Country Hills and Westvale which decreased in density numbers. Two newer contemporary suburban areas in Clair

# Map 8

## AN OVERVIEW OF NEIGHBOURHOODS IN WATERLOO REGION



- |  |                                       |                                    |                          |
|--|---------------------------------------|------------------------------------|--------------------------|
| 1 West Waterloo                        | 12 Victoria Hills/Cherry Hill/GR Hosp | 23 North Cambridge                 | 34 Ayr                   |
| 2 Lakeshore North/Conservation         | 13 Bridgeport/Breithaupt/Mt Hope      | 24 Hespeler                        | 35 New Dundee/Mannheim   |
| 3 Beechwood                            | 14 Grand River/Stanley Park/Chicopee  | 25 Central Preston/Preston Heights | 36 Baden                 |
| 4 Columbia/Lakeshore                   | 15 Frederick/Rosemount/Auditorium     | 26 Langs/Industrial                | 37 New Hamburg           |
| 5 Lincoln/Dearborn                     | 16 Downtown Kitchener & Area          | 27 North Galt/Elgin Park           | 38 North Wilmot          |
| 6 Eastbridge/Lexington                 | 17 Alpine/Laurentian                  | 28 Shades Mills                    | 39 Wellesley Village     |
| 7 Central Waterloo                     | 18 Southwest Kitchener                | 29 Southwood/Southwest Galt        | 40 Wellesley Rural South |
| 8 Westvale                             | 19 Country Hills/Huron Area           | 30 Galt City Centre/South Galt     | 41 Wellesley Rural North |
| 9 Westmount                            | 20 Vanier/Rockway                     | 31 South East Galt                 | 42 Woolwich Rural North  |
| 10 Highland West                       | 21 Doon/Pioneer Park                  | 32 Blair                           | 43 Elmira                |
| 11 Forest Heights/Forest Hill/Lakeside | 22 Hidden Valley/Pioneer Tower        | 33 North Dumfries/Beverly          | 44 St. Jacobs            |
|  |                                       |                                    | 45 Woolwich Rural East   |

Source: Hoy, Sandy et al (2005)

Hills, West Waterloo, and Laurentian Southwest Kitchener increased in density four to ten times over this five-year time period. These results point to a current restructuring and reurbanization in the centre core areas, a population variance that has potential to increase post the revitalization adjustment period; as well, an enhanced mixed use in the newly designed suburban neighbourhood areas.

The McCormick 2006 public health study was included within the research as a general reference only, in that it had established some connection between urban design and neighbourhood health. And on this basis serves a strong argument that neighbourhoods could be more efficiently planned through the idea of healthy neighbourhood design, while supporting the healthy neighbourhood concept.

The thesis research study examined elements of healthy neighbourhood design: walkable streets, human scaled blocks and usable public spaces, while incorporating these ideas into the research interview survey. Key informant participants were asked to comment on neighbourhood design: neighbourhood residential satisfaction, safety, effective physical design to encourage active living, and accessible public transit.

### **4.3 Waterloo Region Neighbourhood Study Evaluation**

#### **4.3.1 Clair Hills (Waterloo West)**

The subdivision of Clair Hills (Waterloo West) was developed approximately eight years ago. Clair Hills (see Map 10) current 2006 Census Planning District population is 10985 (CCSD 2006). This contemporary suburb has grown exponentially from its initial 2001 low population density of 175 persons (Statistics Canada 2001).

Socioeconomic factors for this neighbourhood district include; unemployment rate 3.8%, low income families 3.3%, low income families with children 4.9%, education without a high

school diploma aged 20+ 7.5%, lone parent 10.1%, rental housing 2.3%, children aged 0-6 12.9% (Hoy et al 2005).

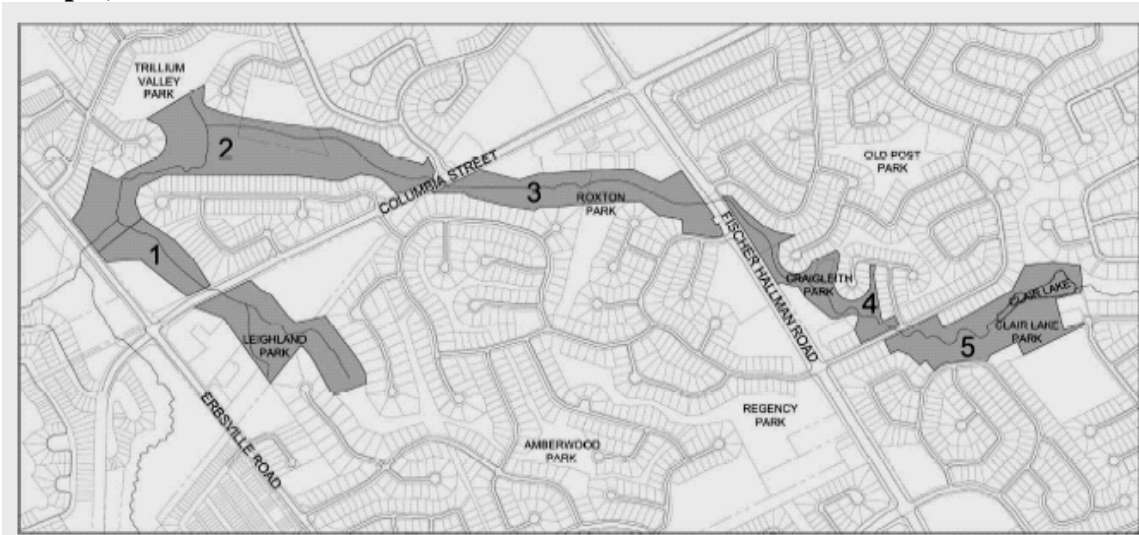
As newer urban design, the neighbourhood lays claim to various contemporary urban attributes to support healthy neighbourhood form; walking trails, formal cycle routes, wooded areas and transit availability. The area has efficient pedestrian and sidewalk infrastructure and offers easy access to greenspace, has focal points in the park, well landscaped streets and attractive garden and stonework landscape at the wide gateway entrance. The GIS Map 10 outlines cycle paths on the west side of the neighbourhood, adjacent to a forest and watershed area. The Clair Hills neighbourhood location has mixed and predominantly higher end housing, while the neighbourhood has a community organization that allows residents to become engaged and participate in a socially supportive neighbourhood.

The Clair Hills neighbourhood has a unique Clair Creek Watershed which comprises an area of 13.5 km<sup>2</sup>. Clair Creek is actually a tributary of Laurel Creek and flow into Clair Lake, which then flows further southeast to meet Clair Creek's South branch. The community benefits from living around nature in the Clair Lake and the surrounding 5.89 ha park (see Map 9), which allows for healthy neighbourhood form, however, this too comes at an environmental cost, which further defines the need for effective environmental and neighbourhood design.

The environmental cost in this new neighbourhood occurred early on in the Clair Lake area, in that the area had become impacted by the effects of urbanization resulting in erosion, sedimentation, and degraded habitat. In 2004 there was a *Clair Lake & North Clair Creek, Class EA & Rehabilitation Plan* (City of Waterloo 2004), one of several reports prior to and during the construction of the area which outlined that the North Clair Creek and Clair Lake could be and had been challenged due to urbanization. This particular study was undertaken in an effort to assess the flood control reach, the capacity, potential and configuration of Clair Lake and the

sediment of the creek and lake system, with the plan to identify and protect the wetland adjacent to the Clair Hills community.

### Map 9, Clair Lake Environmental Assessment 2004

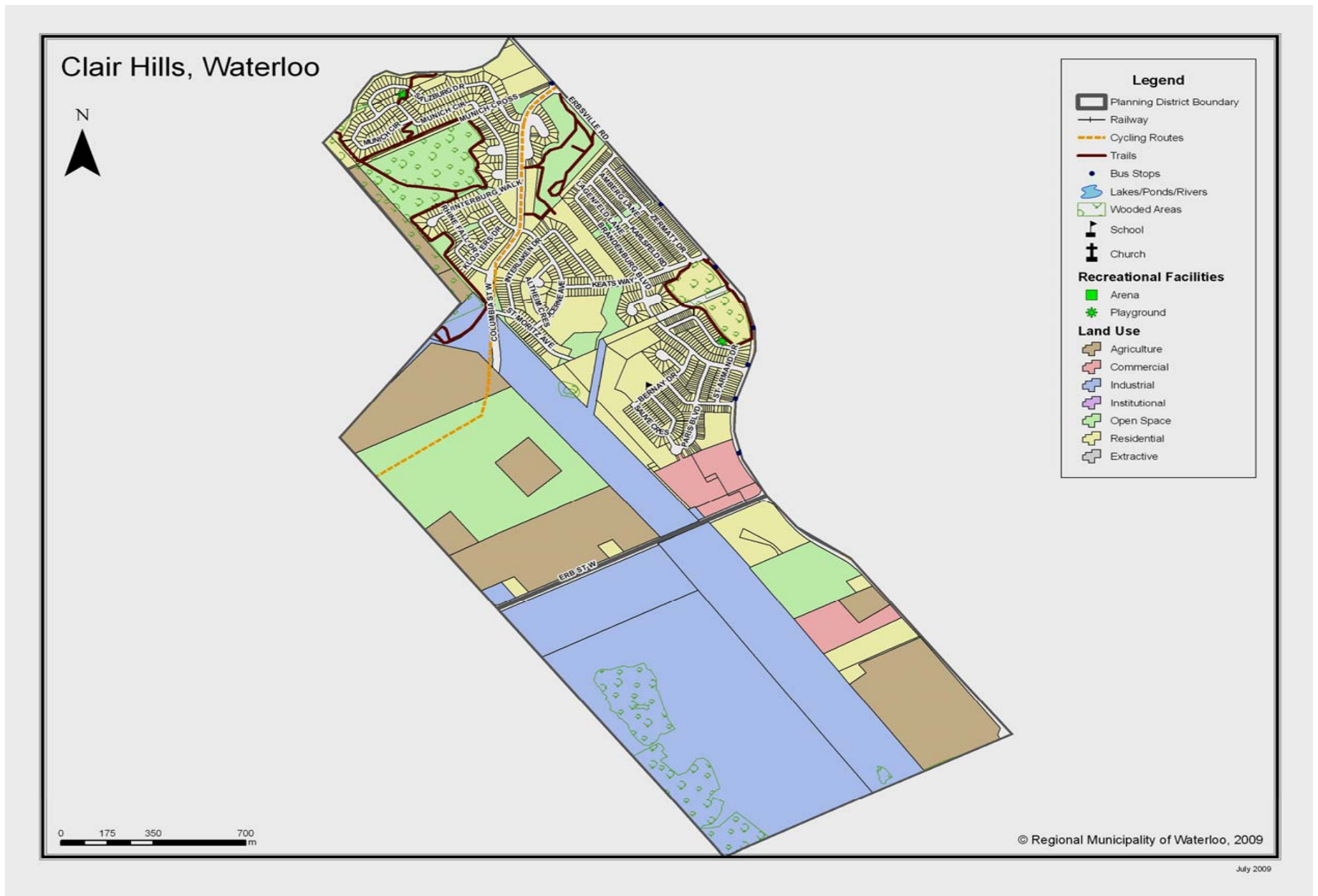


Source: City of Waterloo (2004)

The trail system, maintained by the City of Waterloo, is where area residents walk, cross country ski, cycle and rollerblade. The key informant claimed that “the neighbourhood physical activity level is high as a result of organized neighbourhood recreational sports”. At the time of the study interview, the parks and trails were newly constructed and still required park equipment and adequate lighting. As a result, the key informant claimed that “they were not utilized as frequently at this time, particularly in the evening hours”.

Clair Hills, with newer suburban road system combines grid and cul-de-sac road structure, and wider roads on the primary entrance (see Figure 44, 45) with narrow side roads. Although the road system is contemporary mix of design styles, the streets are not entirely connective for pedestrians, as automobiles continue to dominate the streets and driveways. In an attempt toward healthy urban form, the narrow side streets were designed to promote traffic calming by slowing traffic down and encourage walking. The key informant claimed that “the area has had a problem

# Map 10, Clair Hills, Waterloo



\* Amended Boundary Line for this Census Planning District

Source: Region of Waterloo (2009). Liptay Thesis



with automobiles wanting to claim the road”. That “the community have placed ‘no parking signs’ on some of the narrower streets. These areas are closer to the schools and designed with walkability in mind.”

While the area has attributes significant to promote healthier lifestyle choices, the Clair Hills neighbourhood does not presently present the following characteristics of healthy community design; it does not encourage mixed land use beyond residential use i.e. at the time of the interview, commercial, amenity, or employment use was not within walking distance to encourage physical activity. Public transit, a strong characteristic in promoting physical activity and reducing air pollution, while available within the Clair Hills neighbourhood, “is not readily used” as claimed by the key informant, and “a dependence on the private vehicle remains”.

**Figure 44, Street Median Design**



Source: Liptay (2007)

**Figure 45, Modern Gateway, Clair Hills**



Source: Liptay (2007)

As a newly developed neighbourhood, farther from the city of Waterloo core, the transit system has limited bus service and stops. There is a 10 minute walk to the bus stops, with one to two half hour bus transfer required to travel anywhere, and an hour bus ride to reach downtown Kitchener. GRT Bus Transit (2008) schedule for Laurelwood Route 13 documents wait times in this neighbourhood at 20-35 minute wait, depending on the time of day. The key informant



suggested “that more buses, less transfers, quicker service would encourage residents to use the transit service more. Transit is primarily used by students for recreational use”. The neighbourhood form and the remote location of the Clair Hills suburban area shape it as a high automobile dominated area. As a suburban neighbourhood, the area needs to be more transit accessible and convenient to use.

At this point in time, the Clair Hills neighbourhood key informant made claim that “residents are generally interested in healthy living”. The field work findings for the Clair Hills, Waterloo neighbourhood is supported by the 2005 Fisher report, which recognizes the challenges of newer suburban neighbourhoods built further from the centre core areas.

The research findings understand that community planning and elements of the built environment have an impact on health. A healthy built environment must integrate reurbanized mixed use, have complete supportive communities, accessible transit with focus on active transportation; to increase physical activity, improve air quality and supportive social networks. These are the elements that can encourage healthier choices and create healthier neighbourhoods.

#### **4.3.2 Mary Allen Uptown (Central Waterloo)**

Mary Allen Uptown (Waterloo) neighbourhood (see Map 12) has a unique setting as an older neighbourhood area adjacent to the extensive revitalized centre core. This benefits the neighbourhood in blending the best of two urban form; older pedestrian and contemporary reurbanized form. The current 2006 Census Planning District population for this area is 7750 (Census Canada 2006). The population for this Uptown Waterloo area has decreased since the 2001 Census population at 8730 (Statistics Canada 2001).

Socioeconomic factors for this district include; 77.1% post secondary graduates, an average income of \$53,382, immigrant percentage of 11.8%, visible minority 16.5%, lone parent families

12.2%, population 65 years and older 21.6% and population under 15 years 11.2%, internal migrant mobility of 27.2%, employment rate for (25-54 year olds) 78.8%, and average dwelling value at \$162,317 (Region of Waterloo 2001).

The Mary Allen neighbourhood includes substantial criteria to support healthy neighbourhood form in allowing a good mix of uses, close amenities and a focal point public meeting place. As an inner city neighbourhood close to uptown Waterloo it has the advantage of being central to a host of recreational, employment and transportation services. Given the location of the neighbourhood, there is a substantial level of transportation mode choice. The physical environment (see Figure 46, 47) offers a high level of activity in the area; walking, cycling, easy accessible and frequent public bus transit on the main King street.

**Figure 46, Right of Way, Mary Allen**



Source: Liptay (2008)

**Figure 47, Older Uptown Park**

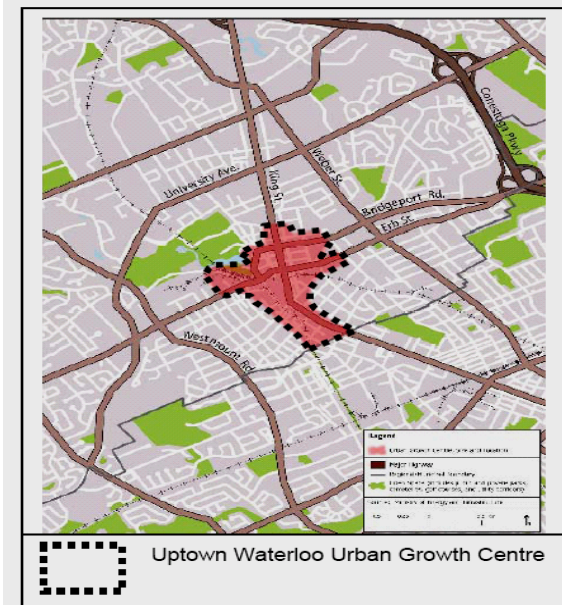


Source: Liptay (2008)

When we think about the location of the Mary Allen Uptown Waterloo neighbourhood area, consideration has to be made of the impact on the neighbourhood from the recent provincial intensification requirement of Uptown Waterloo (see Map 11). That is, the minimum density

targets for the Uptown/Downtown Urban Growth Centre for 2001 to 2031 as a Provincial target of 200 persons and jobs per hectare (Province of Ontario 2009).

**Map 11, Uptown Waterloo Intensification**



Source: Ministry of Public Infrastructure Renewal (2008)

Uptown Waterloo has formal plans to include cultural facilities, institutional uses, public open spaces, as well as residential and employment development that will create a vibrant, human-scaled area and provide public transit support and other transportation modes (City of Waterloo 2009). The Uptown Waterloo Urban Growth Centre is designated as Waterloo's Primary Node to reflect an important intensification area where future high-density mixed use will be planned for, improving the pedestrian environment, streetscape and public transit for residents.

Mary Allen neighbourhood consists of older single family housing, situated along a grid like street system converted into one way streets to avoid congestion. Driveways and garages remain at the back of properties. There are sidewalks on both sides of the street which promote neighbourhood physical activity, and support the uptown Waterloo walking tours that take place

out of the nearby tourist train station. The key informant claimed that “a high level of active participation takes place on the neighbourhood trails, along the railways tracks, Silver Lake and institutional areas. Cycle trails wander throughout uptown Waterloo.”

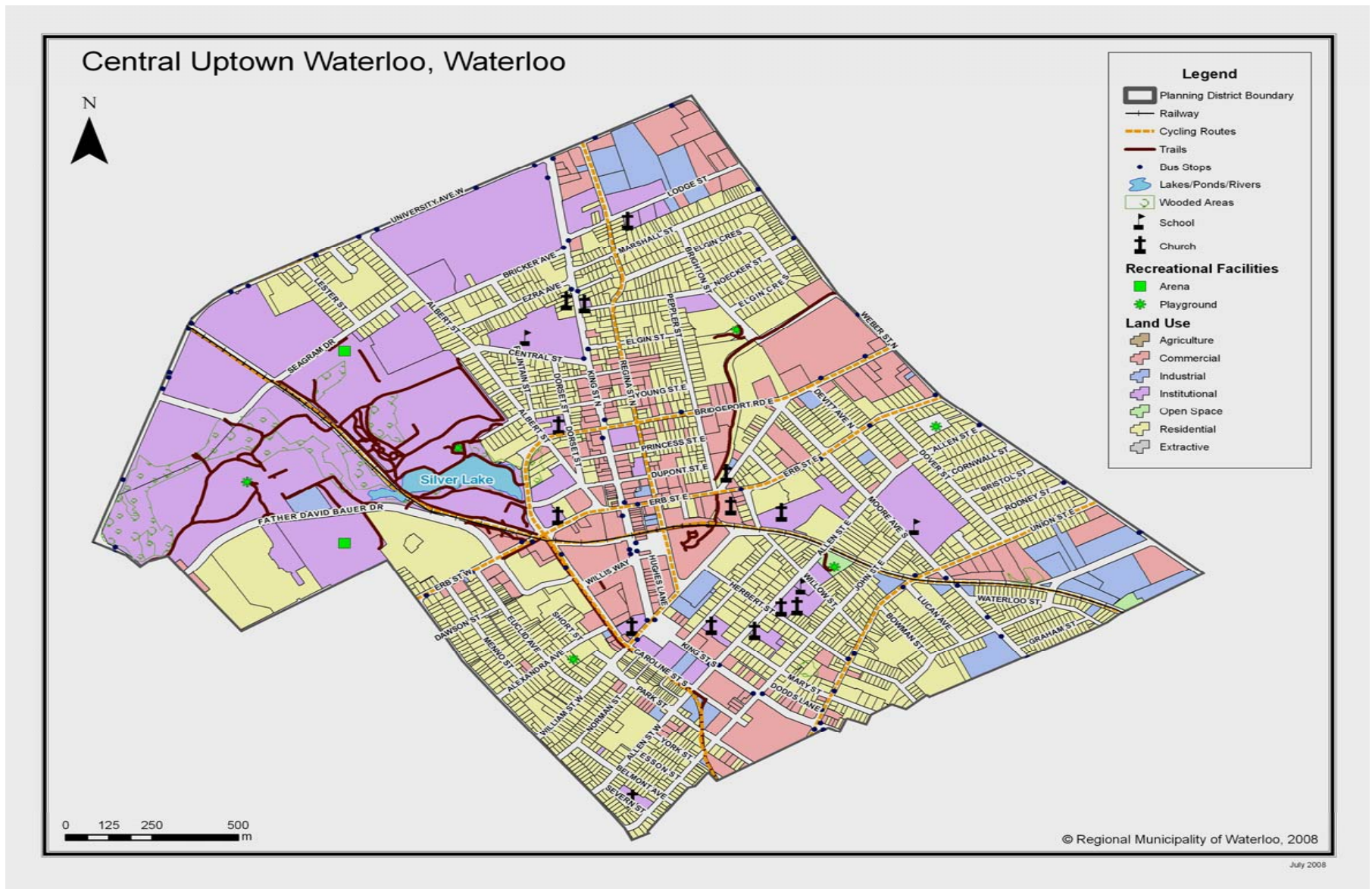
Pedestrian infrastructure that supports healthy lifestyle is in place. In the Mary Allen neighbourhood, the key informant made claim that “young families also cycle on the sidewalks, and due to the streets being quieter, also use the roads”. Central uptown Waterloo area form is high in aesthetic features, such as welcoming modern cycle racks, traditional street lighting, attractive garden arrangements, outdoor cafes, which invite local residents to participate in social walkability in their neighbourhood. While the local neighbourhood pedestrian environment is reinforced, the key informant also commented that “parking in this area was adequate.”

While a transit oriented environment is encouraged, research key informant questionnaire results indicate that “public transportation is frequently utilized in uptown Waterloo, because it is only a short distance to the main King street, therefore it is ideally central for transit.” “Residents make good use of the GRT iXpress bus.” Uptown Waterloo has the highest level of transportation accessibility noted within the neighbourhood field work study, with a high frequency of transfer connections, good wait times under 7 - 10 minutes and convenience right off main King Street.

The area presents an attractive transportation mode option; which surpasses other neighbourhood areas, in utilizing the bus transit system primarily for employment related usage, and school, as well as for recreational purposes. The research demonstrates that “a lot of younger families are moving into uptown Waterloo neighbourhoods as the transit system is conducive to that and ideal with bus stops close together” (see GIS Map 12). This presents a cultural change in a traditional older neighbourhood with a previous high senior population.

The research key informant interview results indicated that “residents in the Uptown

Map 12, Mary Allen, Central Uptown Waterloo



Source: Region of Waterloo (2008). Liptay Thesis



Waterloo Mary Allen neighbourhood welcome the idea of light rail transit as another complement to the rapid bus service, only if the LRT services takes the King Street route, not existing railway track route, transit route option.” This claim is supported in City of Waterloo council minutes.

The key informant made claim that “the neighbourhood area, closely situated to uptown centre core area, is safe to walk alone or in a group at night. That the residents felt that any increased safety level is related to increased activity and lighting in the central core, supported by increased revitalization and outdoor cafes.”

Research key informant questionnaire results indicate that “the local residents look forward to embracing the new centre core presently under construction as a central meeting place.” There is a small park within the neighbourhood as well as the larger Waterloo Park, close to the Waterloo Recreation Complex, also within walking distance. Through the recent reurbanization of the Bauer loft building, the Mary Allen neighbourhood also encourages a healthy connectedness to its historical past, as well provides access to a variety of experiences, resources and social interaction.

#### **4.3.3 Westvale Meadows (Westvale), Waterloo**

Westvale Meadows (Westvale), Waterloo district was created in 1978, a 31-year old subdivision situated between the Fischer-Hallman and University Avenue area, or Fischer-Hallman and Erb Street with a district area of 193 ha. The 2006 Census Planning District population is 6430 (Census Canada 2006), which, in this suburban neighbourhood, has decreased slightly from its 2001 population at 6460 (Statistics Canada 2001).

Even with a slight decrease, the neighbourhood appears to be maintaining density at a moderate level over time, regardless of a high level of young families. It is possible that this subdivision has reached its growth peak, has a maturing (and exiting) student population, or that its population variance over the previous 5 year span, may have been affected by the close

proximity to uptown Waterloo and intensification efforts. Socioeconomic factors within this planning district include; post secondary graduates at 71.4%, average income at \$84,607, immigrant percentage at 4.9%, visible minority at 9.4%, lone parent families at 9.9%, population 65 years and older at 4.3%, population under 15 years at 28.2%, internal migrant mobility at 15.5%, employment rate at 87.3%, and the average dwelling value at \$179,360 (Region of Waterloo 2001).

The Westvale Meadows neighbourhood district includes a number of healthy community attributes: mixed land use, greater land density to shorten distances, accessible public transit, walking trails, pedestrian infrastructure in sidewalks and access to greenspace near the schools. The subdivision has developed significantly in housing and density, with small neighbourhood parks, as well as two elementary schools, a high school, and daycare within the area.

As a moderately older subdivision, Westvale Meadows has mature street design, (clearly marked on the GIS Map 13), with ring roads and cul-de-sacs roads coming off the main road (see Figure 48, 49). The street form is primarily larger block sizes and narrow side streets. The key informant claimed that “it takes residents time to ‘get around’ the winding crescent streets and felt that the majority of residents do not envision the road system as directly connective”. Although Westvale Meadows is a developed subdivision, it does not have formalized cycle trails, although informal walking trails near the schools exist that the cyclists use. This neighbourhood has less greenspace than other suburban areas of a similar age bracket.

The research field work documented housing in the Westvale areas as mixed, with single family homes, older semi detached and townhouses. The majority of the single car driveways have two vehicles, while autos also park on the narrow side streets. The research indicated Westvale Meadows has a “high level of recreational physical activity in the area, with residents

walking, cycling and making use of public transit”. The key informant indicated that “younger residents embrace healthier lifestyles by cycling to schools and the local universities”.

**Figure 48, Streetscape, Westvale**



Source: Liptay (2007)

**Figure 49, Fenced Walled Pathway**



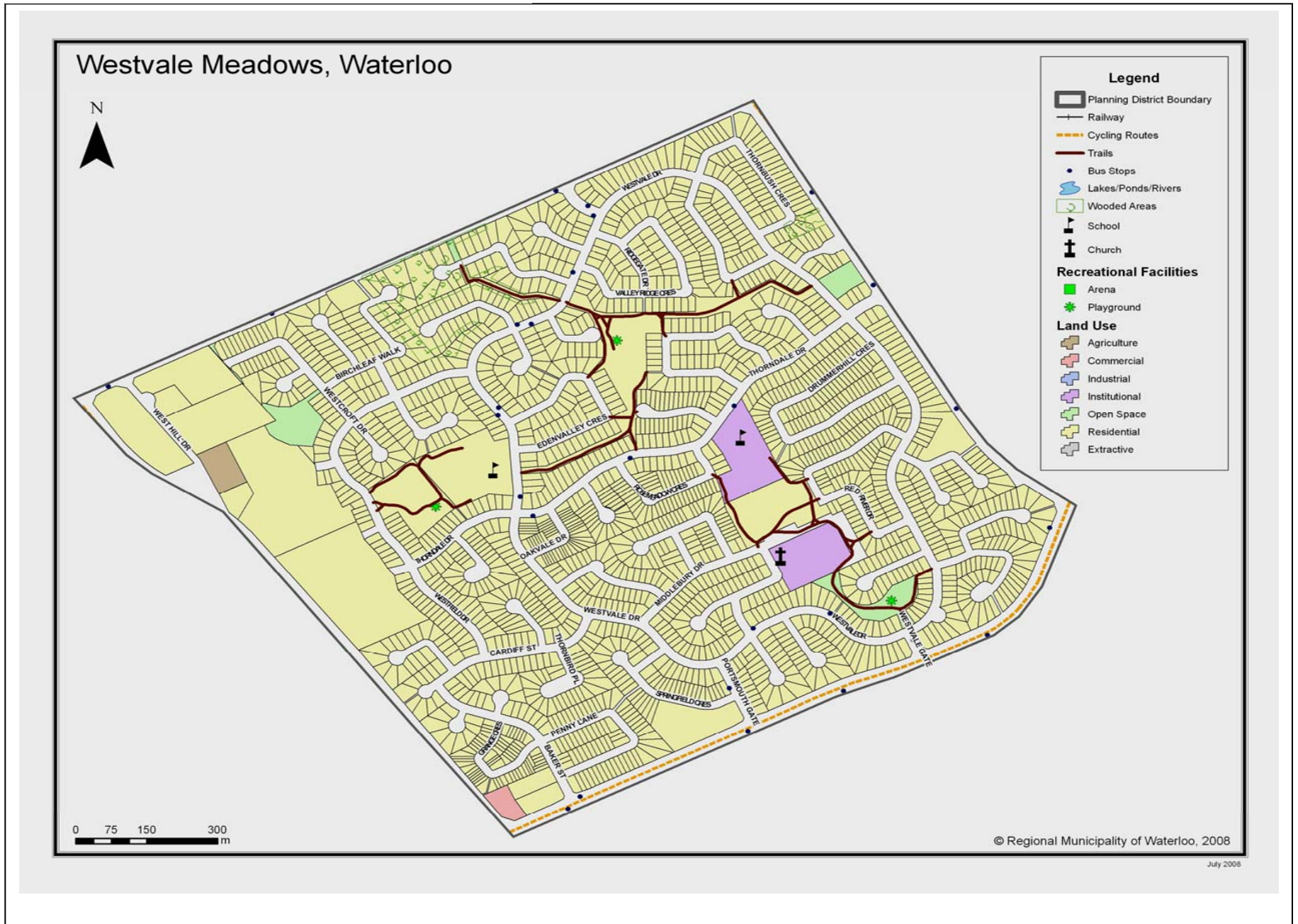
Source: Liptay (2007)

Research field visits noted aesthetic planning in this neighbourhood area of moderate landscaping with limited attractive focal point areas of interest, other than the local mini mall. This neighbourhood is primarily a residential suburban area with amenities within a kilometer walk. The bus transit stops are a 5-10 minute walk away and have an approximate 10-20 minute wait. There is convenient and accessible transfer to other buses in the uptown Waterloo area, for recreation facilities such as the Waterloo recreation complex, uptown centre core or Waterloo park.

The Westvale neighbourhood area is presently the focus of a land use study (City of Waterloo 2009) on the impact of the Westvale District Plan, the impact of landfill traffic, internal transit implications, bike linkages and access, and local street intersection analysis. The idea is that the ‘central spine area’ should be planned together with an overall urban form concept and pedestrian environment and transit ideals. The intent is to encourage greater movement within the area, to facilitate public transit, pedestrian and cycling flow in the area (City of Waterloo 2009).



Map 13, Westvale Meadows, Waterloo



Source: Region of Waterloo (2008). Liptay Thesis

Current street design change in the local area is reviewing Thorndale Drive as it connects to Ira Needles Boulevard. Traffic within the Westvale neighbourhood will redistribute to Thorndale, however is not expected to increase substantially as it provides little network connectivity outside of connecting Fischer-Hallman Road to Ira Needles Boulevard. Proposed street change in the neighbourhood also noted that Baker Street, Portsmouth Gate and Westvale Gate will experience decreased levels of service with increasing traffic volumes on University Avenue (City of Waterloo 2009). The Region of Waterloo is considering widening University Avenue in the area to a 4-lane cross-section, to reduce delays and provide high-quality arterial service level on the arterial grid surrounding the Westvale neighborhood. This would also reduce the use of Thorndale Drive as a shortcut.

The Urban Design Guidelines for the Westvale neighbourhood area identify future priority and secondary pedestrian route and community trail on the western property boundary. The Westvale District Implementation Plan street network and access falls under the Region of Waterloo Master Transportation Plan.

#### **4.3.4 Shades Mills (Shade Mill North & South), Cambridge**

Shades Mills, Cambridge neighbourhood area is bounded by Franklin Boulevard, Townline Road, Bishop Street and Avenue Road. Current 2006 Census Planning District population is 14300 (Census Canada 2006), 6620 North Shade Mill, 7680 South Shade Mill. The total district population of 14300 represents an increase of approximately 4,000 residents since 2001 area population at 10225 (Statistics Canada 2001). The population density increase is largely generated from the newer South Shade Mill mixed housing development, rather than the original older large single detached high end housing area.

Socioeconomic factors for this planning district include; post secondary graduates at 61%, average income at \$104,546, immigrant percentage at 5.4%, visible minority at 20%, lone parent

families 8.3%, population 65 years and older 4.5%, population under 15 years 28.3%, internal migrant mobility 22.5%, employment rate 85.3%, average dwelling value \$226,666 (Region of Waterloo 2001).

The older (north) area of Shade's Mills neighbourhood originally represented the Cambridge area known today as Galt. The neighbourhood area houses historical Victorian homes, lighted streetscapes lined with older maple trees. Dickson Hill and the inner lying area characterize Cambridge's strong heritage in stone buildings of the past (see Figure 50, 51). The built environment incorporates residential and recreational use, and presents healthy neighbourhood attributes. The older neighbourhood section has a well developed area and an aesthetically pleasing landscape. Residents enjoy cycling or walking their dogs on organized trails. The neighbourhood has several schools in the area.

The traditional older north section of the Shades Mill neighbourhood in Cambridge was designed with wider connecting grid streets, smaller narrow side streets, with traffic calming in place to reduce congestion and noise. There is moderate direct connectivity for pedestrians, with some one way streets on the newer south area of Shades Mills. The neighbourhood has a cul-de-sac road system with a less direct route. The GIS Map 14, outlines overlaps of open greenspace, vast wooded areas which include the Conservation area and Shade's Mill lake. The neighbourhood has good linkage to Shades Mills GRCA Conservation area in an environmental open space park system that promotes hiking, swimming and local recreational activities.

There is effective linkage throughout the neighbourhood to other well circulated greenspace, trails and parks that link other neighbourhood areas. The key informant claimed that "the local residents enjoy a high physical activity level in the area, although, aside from the Shades Mills Conservation area, there are no formal cycle trails within the neighbourhood area itself, resident's cycle on the walking trails and streets".

**Figure 50, Suburban Sidewalk**



Source: Liptay (2007)

**Figure 51, Streetscape, Shades Mills**



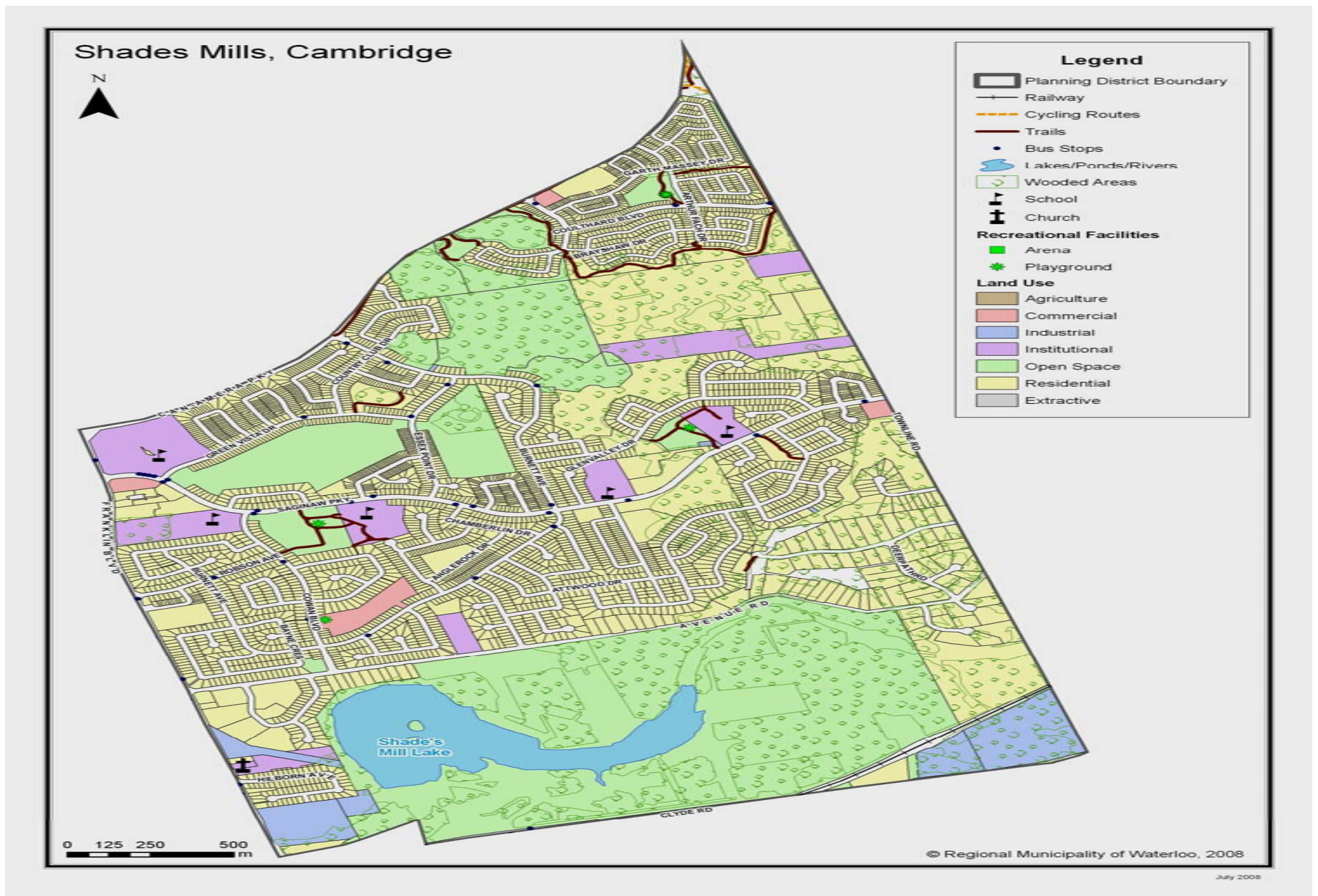
Source: Liptay (2007)

The field work documented the majority of households in the older section of Shades Mills having two (or more) vehicles on the large lot sizes, situated in side or back alleys. The newer mixed housing area has driveways in the front area and one (or two) vehicles. The key informant stated that “bus transportation is not used as frequently, although there is only a 10 minute walk to the stops”. “Residents continue to drive for most amenities at least a kilometer away”.

This supports a Cambridge ‘Mode to Work’ community trend Census data (2001) which indicates that 83% of Cambridge residents drive a private vehicle to work. This compares with 72% of Ontario population that drive to work. 3% of Cambridge residents use public transit to get to work and 4% walk or cycle. These figures are lower than regional and provincial figures, where 13% of the provincial population use public transit, while 7% walk or cycle to work (Statistics Canada 2001).



Map 14, Shades Mills, Cambridge



Source: Region of Waterloo (2008). Liptay Thesis

#### **4.3.5 Central Park, Cambridge**

Central Park, Cambridge, is situated on the edge of downtown Preston, adjacent to the Grand River waterway. Similar to the Mary Allen, Waterloo neighbourhood, in its location to the city core, Central Park is in many respects interpreted as part of the downtown Galt area. Census 2006 Planning District population for Central Park is 9210 (Census Canada 2006), which has decreased slightly since 2001 population estimates at 9250 (Statistics Canada 2001), or could be presented as maintaining density levels.

Socioeconomic factors for this planning district include; post secondary graduates at 42.1%, average income of \$54,944, immigrant percentage of 2.4%, visible minority 5.9%, lone parent families of 17.5%, population 65 years and older 14.3%, population under 15 years 18%, internal migrant mobility 12.2%, employment rate of 82.7%, average dwelling value \$149,686 (Region of Waterloo 2001).

Central Park has a number of local businesses in the downtown area including local café's, reuse of the old Grist Mill Centre, and other historical buildings. It has the Allan Reuter Centre for seniors on King Street West, close to the Cambridge Library. The main neighbourhood Central Park (see Figure 52) is located at the corner of King and Argyle street and is a popular area which encourages neighbourhood recreation and physical activity, and a local food market (see Figure 53) to engage social community. There are other parks heading into the centre core area which proceed along the downtown route next to Hamilton street.

Closer to the Galt end, the railway runs north/north east, adjacent to one cycle and formal walking trails (Mill Race Park, the Living Levee, Dan spring Way, Dickson Park) along the rail lines, near the Grand River. Key informant questionnaire results indicated “a need for improved access to the Grand River and waterfront, to enjoy a community that lives along the water's edge”. Results claimed that “the city of Cambridge has focused more on flood prevention with

blank high unattractive river walls, than utilizing the Grand River as a recreational aesthetic enjoyment”. As well, that there are “some safety concern in that the trails also cross busy streets and felt that although there was one formal cycle path in place, additional formalized cycle lanes were required”.

As indicated on the GIS Map 15, Central Park, and continuing into the downtown area, streets are traditional mature grid lined streets with a high number of distance stops. Throughout the neighbourhood area, there are direct route streets with good connectivity for pedestrian use.

**Figure 52, Central Park, Cambridge**



Source: Fegan (2008)

**Figure 53, Central Park Market**



Source: Steinmetz (2008)

The key informant noted that “Central Park residents expressed concern with the high traffic volume and ongoing vehicle congestion. Area residents have expressed that the area has significant traffic issues, traffic train delays and poor road conditions”.

As a neighbourhood that is compact in its centre core with natural features on the outskirts, the neighbourhood meets healthy urban form criteria in having mixed land use; residential, employment, commercial. While Central Park is preserved in its heritage form, intensification of Central Cambridge continues through a revitalization of the downtown area and several of the older factories have been reused into loft housing. The neighbourhood has good street connections along the transit route with a relatively newer bus transit station which is easily

accessible from downtown. Key informant questionnaire results record “a moderate level of bus transit use, including the iXpress bus transit to Kitchener-Waterloo, with good wait times of less than 10 minutes, as well as convenient bus transfers”.

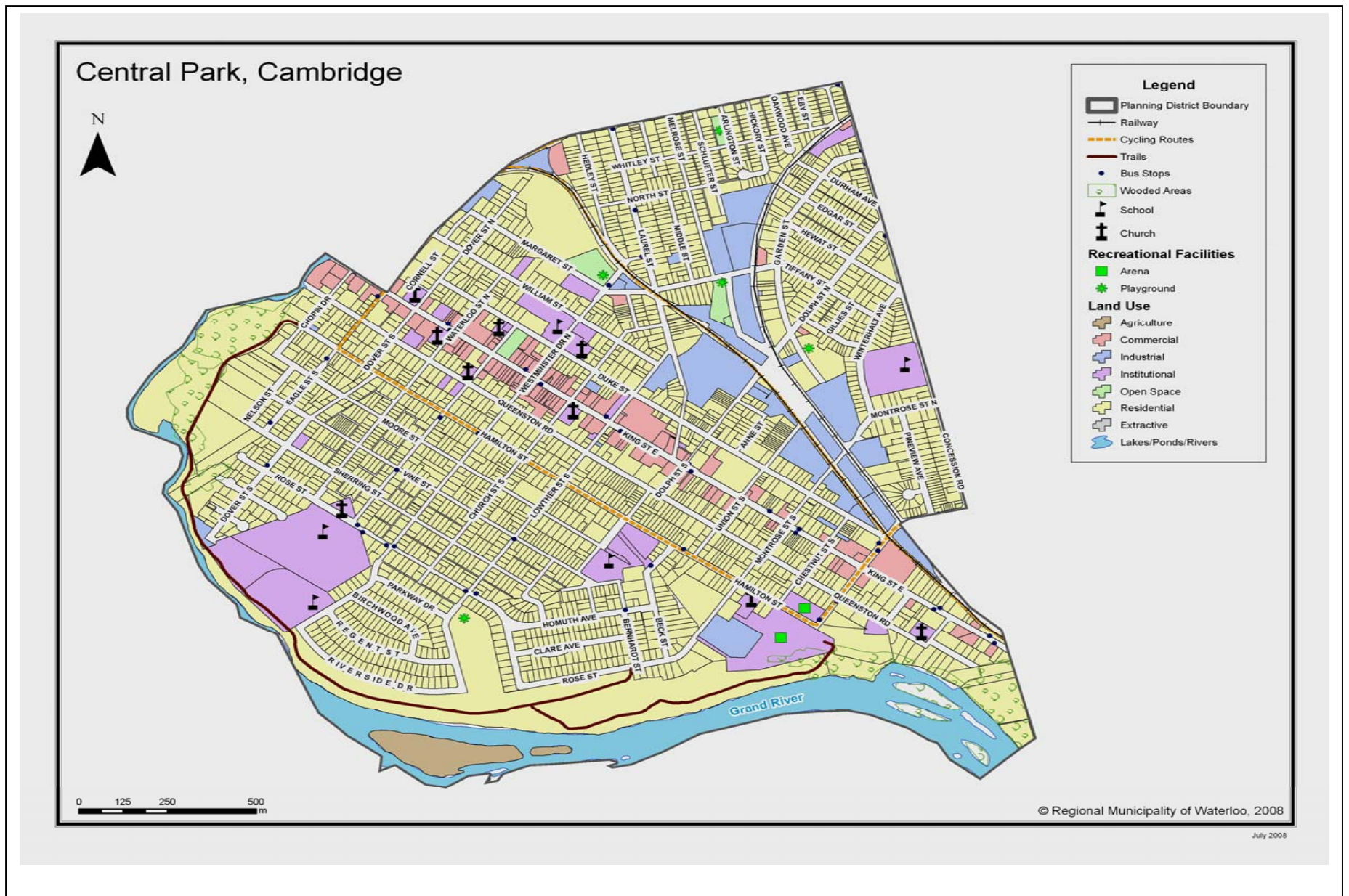
“Central Park residents use the transit system for employment and school usage as much as recreational use due to its easy functionality”. Research indicated that “residents value the close location of the transit system”, however the key informant expressed “the need for an expanded transit system, with buses that were quicker and more connectively linked to other regional areas”. Key informant questionnaire results indicate that “Central Park residents support the idea of a light rail transit system which would allow travelers to move efficiently from Cambridge to Kitchener or Waterloo. The neighbourhood area residents make use of one personal vehicle, sometimes two, while consensus was that downtown parking was adequate”.

Revitalization in the central core area is ongoing, with efforts to develop a pedestrian scale streetscape environment and encourage more residents downtown. The Central Park neighbourhood and City Centre area benefit from the Canadian Heritage River in the Grand River, and historic architecture, with a number of revitalization projects turning old manufacturing buildings into downtown lofts.

The market area is predominately comprised of the immediate surrounding residential area, which shows some growth through new high-density developments. In addition, high traffic volume through this area adds to the market potential (City of Cambridge 2009). There are recent revitalization efforts in the Central Park downtown core area; development of the former Kanmet site on Margaret street into residential townhouses and an apartment complex, Community Farmers Market in Central Park, Improvements to the Central Park bandstand, and riverside Park improvements including Riverside rails skate park. Future development in this neighbourhood area include: work schedule for Preston Springs, and Cresview development.



Map 15, Central Park, Cambridge



Source: Region of Waterloo (2008). Liptay Thesis

#### **4.3.6 Country Hills West (Country Hills), Kitchener**

Country Hills West, Kitchener is an older subdivision in the area off Bleams Road, Strasburg Road and Block Line Road. Census 2006 Planning District population is 4180, a decrease of approximately 2026 residents since 2001 population density at 6206 (Statistics Canada 2001). The decrease in area population is significant and may lend itself to a number of factors including a maturing senior neighbourhood or exiting older student population.

Socioeconomic factors for this planning district in 2001 were documented as; post secondary graduates at 42.5%, average income \$76,012, immigrant percentage of 5.8%, visible minority 14.2%, lone parent families 9.9%, population 65 years and older 4.2%, population under 15 years 26.5%, internal migrant mobility 8.2%, employment rate 84.1%, average dwelling value \$161,660 (Region of Waterloo 2001).

The Country Hills West neighbourhood urban form maintains some essential healthy community traits; it has a range of housing types, is pedestrian friendly, however, it has less community focal points of interests relative to other neighbourhoods of similar size. The GIS Map 16, illustrates the area road system with wide winding cul-de-sac and ring roads, with less than direct routes. The field work records the primary roadways as having substantial width (see Figure 54). The key informant stated that “residents enjoy walking and cycling on the sidewalks and roads”. Collector streets include on street parking, adequate sidewalks and streetscape elements. The GIS Map 16 illustrates how the neighbourhood comes together in the centre with a small wooded greenspace park area, near the school, lined with a winding walk and hiking trail. However, the key informant presented “low to moderate usage, with no formal cycling trails”.

Country Hills West residents do have a common meeting place in the recreation centre that supports community interaction and activities for the local children. The residents also walk to the commercial strip mall within a ½ kilometer for small amenities, although most residents drive

for larger needs. The field work recorded the area with mixed housing, single family detached houses with wide driveways, semi detached, townhouses, tall apartment building and newer smaller sized condominiums. The bus stops (see Figure 55) are reasonably spaced apart, with a 10 minute walk to the main roads. The key informant noted that residents use public transit regularly for both employment and school, as there are a number of young and middle aged children, and housing of different moderate economic levels.

**Figure 54, Older Suburban Road**



Source: Liptay (2007)

**Figure 55, Bus Transit, Country Hills**

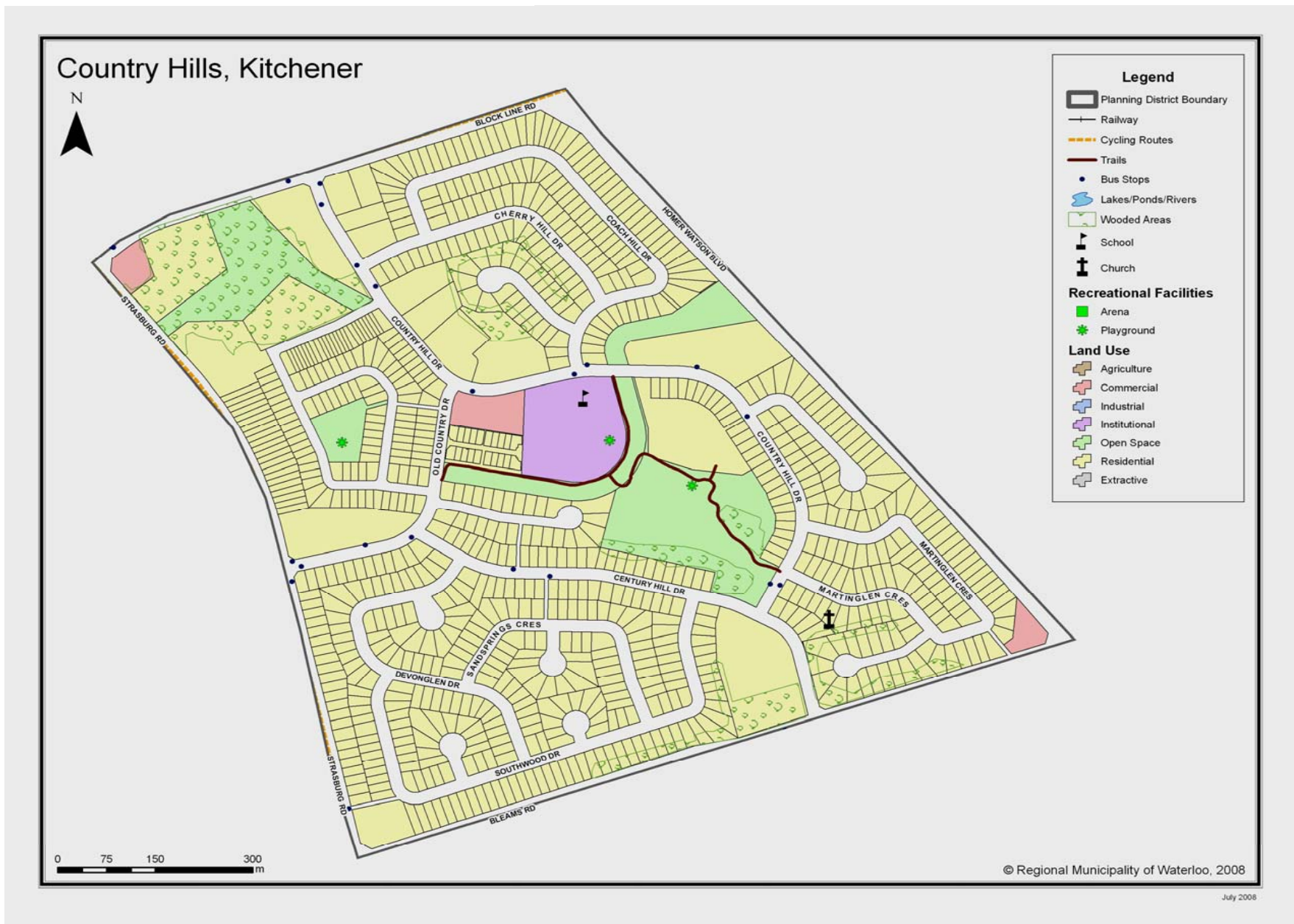


Source: Liptay (2007)

The research field visits recognize the Country Hills West area as having adequate focal points in the neighbourhood and encourages healthy physical activity, through a quiet and aesthetically attractive area with nice gardens and adequate street lighting and moderate greenspace. The park area trail near the school made note within the key informant questionnaire results as “requiring trail lighting, as a safety concern”. During the field visits, in comparative to other neighbourhoods in the study, Country Hills neighbourhood appeared to be a less physically active environment.



Map 16, Country Hills West, Kitchener



Source: Region of Waterloo (2008). Liptay Thesis

The decreasing population in 5 years by 2,000 is a concern. It may very well be that this neighbourhood area requires better integration of urban form into the neighbourhood design process. Similar to Westvale Meadows, Waterloo, it may require specific examination into enhanced pedestrian road connectivity, focal points and destinations, or transit supportive environment, to ensure the creation of an attractive walkable neighbourhood that contributes to complete communities.

#### **4.3.7 Civic Central Frederick (Central Frederick), Kitchener**

Civic Central Frederick, Kitchener (see Map 17) area is designated under the Central Frederick Census Planning District. Census 2006 population for this Planning District is 3595 (Canada Census 2006), which, has decreased slightly in the last five years from the 2001 Census Planning District population of 3650 (Region of Waterloo 2009). This neighbourhood area presents a lower comparative population to other study neighbourhood areas, with potential for growth change.

Socioeconomic factors for this planning district indicate; post secondary graduates at 63.4% - 66.2%, average income \$42,964-\$57,955, immigrant percentage 3.4% - 5.2%, visible minority 2.5% - 5%, lone parent families 7.5% - 18.6%, population 65 years and older 12.1% - 32.9%, population 15 years and under 6% - 18.5%, employment rate 82.6% - 83.9%, and average dwelling value \$142,773 - \$144,387 (Region of Waterloo 2001).

The Civic Central Frederick district, originally referred to as Mackenzie King Square, was planned in 1965 as a contemporary urban square with architecturally bold buildings situated in a park like setting. Historically, downtown Kitchener has been a focal point for the Region of Waterloo, as a centre for trade, politics, entertainment and culture.

Today, the vision for downtown Kitchener is to develop the Civic Central Frederick area toward a more pedestrian environment. The community sees this happening with increased mixed

use, a downtown with lively street activity, markets, shopping, outdoor cafes and cultural events. Recent urban form focus for this areas looks at increased greenspace, livable streets combined with creative high quality urban design of buildings, storefronts and public places. Its unique heritage to be conserved with new forms of artistic design (City of Kitchener 2006).

As the neighbourhood presently stands, Central Frederick/Civic Centre advocates characteristics for healthy community form; mixed land use and greater land density to shorten distances to encourage walking, transit accessibility, close local amenities, entertainment venue where residents can become socially engaged. The key informant noted, however, that “the neighbourhood could be further enhanced by a central public meeting place”, other than Kitchener city hall down the road. This may find resolve with the construction of a public square at King and Frederick Street slated for completion August 2009 (City of Kitchener, 2009). The field visits noted this downtown area with traditional grid road systems which make better use of urban form and reduce reliance on the automobile.

The key informant noted that “GRT bus transit in the Civic Central Frederick street area is used frequently”. “That the residents walk downtown while bus transit is conveniently timed at every 10 minutes, with easy accessible transfers”. The bus system is used for employment and recreation, with easy connections to the nearby bus transit terminal and other recreation facilities. Private vehicles in this neighbourhood are at one (rarely two) cars per residence, parked at the back or driveway, with limited downtown parking availability. Amenities and downtown Kitchener are within convenient walking distance.

The neighbourhood has mixed housing; older heritage residential single family detached houses from the late 1800s and early 1900s, with deep porches, revitalized duplexes or smaller apartments. Parking is situated at either the side of the house or back. The field work results document the area as having consistent aesthetic streetscape linked by mature trees, grass

boulevards and laneways. The neighbourhood area is surrounded by unique buildings, including churches, commercial business and government buildings, central to the downtown area (see Figures 56, 57). The neighbourhood is close to the once existent city hall, and down the street from the new city hall building. The civic district is home to a number of civic uses: public library, Centre in the Square concert hall, local theatre and Art Gallery.

The key informant explained that “the local residents define their neighbourhood area as largely an older neighbourhood with an adjacent downtown area”. The downtown area is undergoing recent reurbanization in terms of reuse of old buildings and homes into businesses and urban lofts.

As an older neighbourhood, the grid street design has moderate clear directive and multiple stops. The street layout provides good pedestrian sidewalks on both sides, mature trees, connectivity with the narrower side streets that abut form the wider Frederick street ‘main’ area.

In support of the city’s claims for increased greenspace in the downtown area (City of Kitchener 2006), the neighbourhood key informant claimed that “there was concern that the neighbourhood had limited open greenspace. The district has a small neighbourhood park in Hibner Park, which is Kitchener’s second oldest city park, and a smaller parkette near the Edna Street area, both aside from Victoria Park, which is a 10-15 minute walk away. Any structured walking or cycle routes do not exist, other than the small trail next to Edna Street parkette.

The City of Kitchener (2006) stipulates that any new development in the Civic District include the following design principles: that all new development include bold architectural style intended that this district look like and function as one coordinated urban square. That building height and form, while including new form, be sensitive to the historic scale and features of the surrounding streets, especially with historical buildings such as the Sonneck House and the

Governor's House and County Gaol. New buildings should be surrounded by high quality landscaping with a variety of seating area. And streetscape elements, such as light poles and

**Figure 56, Intersection, Civic Central**



Source: Liptay (2007)

**Figure 57, Street Light, Kitchener**



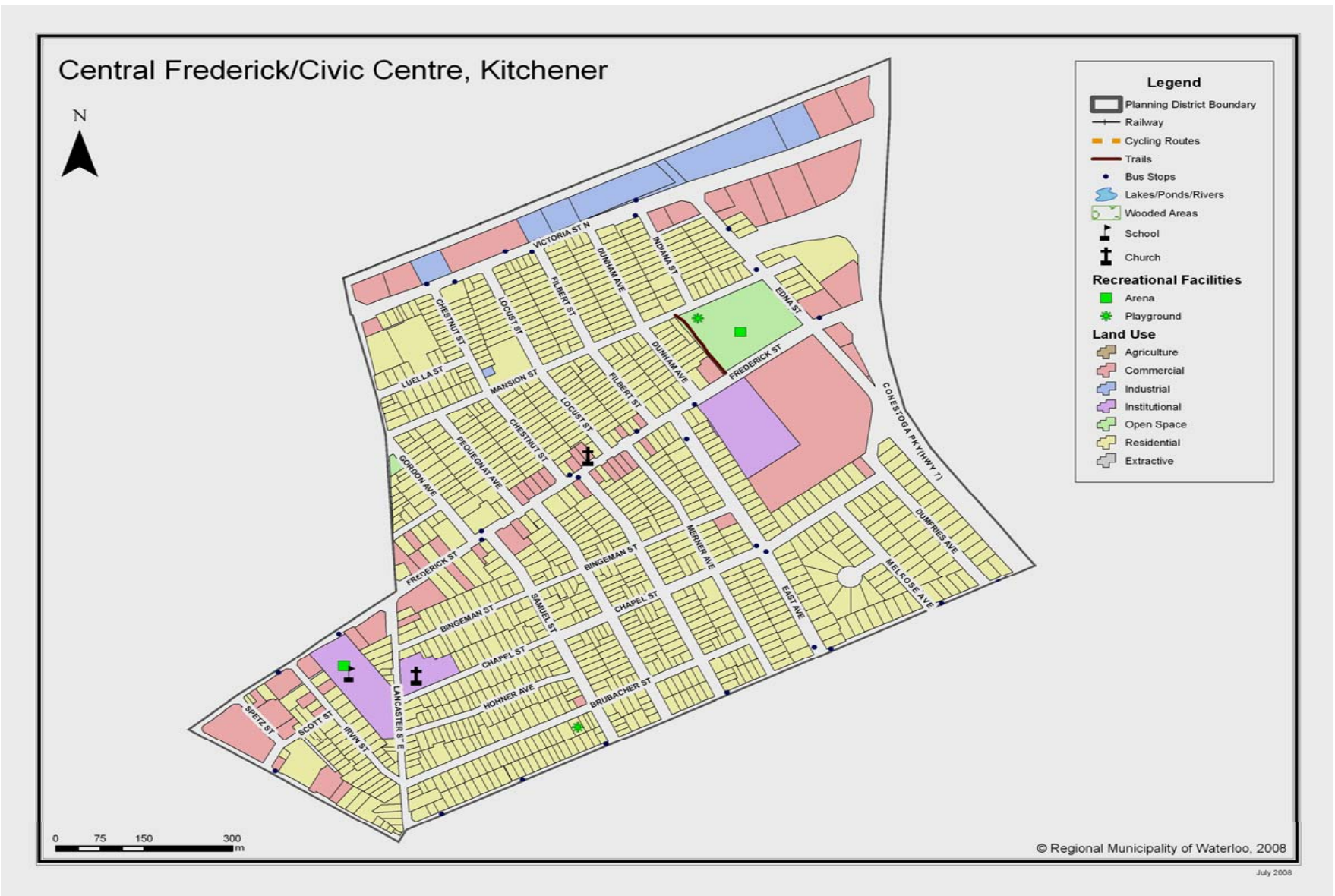
Source: Liptay (2007)

benches, internal to the District and along Frederick Street, should celebrate arts and culture, including outdoor public art incorporated into each development (City of Kitchener 2006).

Presently, the City of Kitchener, working with the Region of Waterloo, is looking at the Frederick-Benton Corridor (Lancaster Street to Courtland Avenue), as the potential location for a grand central median to accommodate such activities as walking, cycling, special events and outdoor markets. This concept may also include a staging ground for Oktoberfest programming (City of Kitchener 2006).



Map 17, Central Frederick/Civic Centre, Kitchener



Source: Region of Waterloo (2008). Liptay Thesis

#### **4.3.8 Laurentian West, Kitchener**

Laurentian West, Kitchener is a newer suburban neighbourhood approximately 15 years of age, formed in a 440 ha area on the west side of Kitchener. Laurentian West is situated (see Figure 58, 59) by the Conestoga Parkway on the north, Trussler Road on the west, Bleams Road on the south and Westmount Road and Fischer-Hallman Road extension on the east. It is more notably recognized as the Ottawa Street and Fischer-Hallman area of Kitchener.

The 2006 Census Planning District population is 11,230 (Census Canada 2006), which has almost tripled its earliest 2001 population numbers at 3860 (Statistics Canada 2001). Population density is high in this suburban area and continues ongoing development growth. Socioeconomic factors (see Table 11) for this planning district include; post secondary graduate 52.6%, average income \$70,857, immigrant percentage 9.3%, visible minority 13.4%, lone parent families 6.3%, population 65 years and older 2.1%, population under 15 years 29.4%, employment rate of 85.1% and average dwelling value \$157,688 (Region of Waterloo 2001).

Laurentian West had an original Community Plan approved as far back as 1979 which lay out the land use policy for the area designated as suburban development with some mixed use, commercial, recreation, education and institutional facilities. The original Plan was delayed due to funding, and was introduced and updated in 1993 with increased environmental protection, a limit on the number of schools and introduction of a node of commercial, office and a shopping centre to the east edge of the community, as well, an elimination of the extension of Block Line Road through the community (City of Kitchener 1993). The neighbourhood has three significant natural resources; the Laurentian Wetlands, the Borden Wetlands, and the forest on the south side of Ottawa Street. In the original plan, limited residential development was allowed in the woodland area.

One of the interesting things about this Kitchener neighbourhood in terms of urban form planning is that it was the first neighbourhood in Kitchener to develop Neo-traditional concepts of urban design. This approach in the urban form of Laurentian West, promotes integration of land uses, mixed housing, pedestrian access to community facilities to reduce trip length. The Plan created a town centre and allowed for mixed uses, pedestrian links and transit orientation. The urban plan for this neighbourhood was also the first to have commissioned an independent Environmental Review of the area prior to development (City of Kitchener 1993).

In these firsts as a Neo-traditional community, it is worthy of note to examine the neighbourhood community form 10 years later to determine what worked in creating healthy community design, and what didn't.

At the community scale, Laurentian West has a healthy mix of land use including a variety of housing types and park spaces, schools, shopping areas and employment opportunities. In a 10-year period, this neighbourhood area has progressed from an initially designated Community as Low Density Residential, Neighbourhood Commercial, Service Commercial and Major Open Space (City of Kitchener 1993), to a High Density Mix Use subdivision. The neighbourhood demonstrates a high level of characteristics for healthy neighbourhood design; integrates natural and heritage resources and includes walkable neighbourhood with interesting streetscapes, focal points and destinations. (Additional Kitchener area neighbourhoods designed at the 'community scale' include Forest Heights and Stanley Park) (City of Kitchener 2007).

Although the design of the Official Plan for this area was neo-traditional, the Laurentian West field work digitally recorded some factors contrary to this plan i.e. street design and transit challenges. The field work recorded the neighbourhood as having area complex inner streets with crescent cul-de-sacs, and loop road system, which tend to wind in a non-direct path. The area has

**Figure 58, Intersection, Laurentian**



Source: Liptay (2007)

**Figure 59, Laurentian West Park**



Source: Liptay (2007)

a high number of intersections, and area multiple 4-way road stops which key informant #1 indicated as “a challenge for congestion, delays and regular vehicle accidents”. The area roads indicate a high number of courts, limited or no sidewalks, with a neighbourhood directly adjacent to the busy Fischer-Hallman and Ottawa streets and Highway 7/8 cutoff.

As a young suburban neighbourhood with a high number of children, two elementary schools within walking distance were planned and implemented. Housing in this neighbourhood is newer contemporary suburban with long single driveways and garages that dominate the frontal house, fitting two vehicles, although “the streets are continuously congested with additional parking”, and represents the highest level of neighbourhood congestion within the research study areas.

Laurentian West neighbourhood does present healthy connective open greenspace areas with some smaller wooded areas, a district park of 4 ha located near the schools, and few developing trails near the schools. The GIS overlays on Map 18 point out the cycling path directly on Ottawa street which key informant #2 claimed “is used regularly by area cyclists.” Interview informant #3 indicated that “local residents who cycle find the location is in conflict with the busy ongoing traffic coming on and off Highway 7/8 cutoff.”

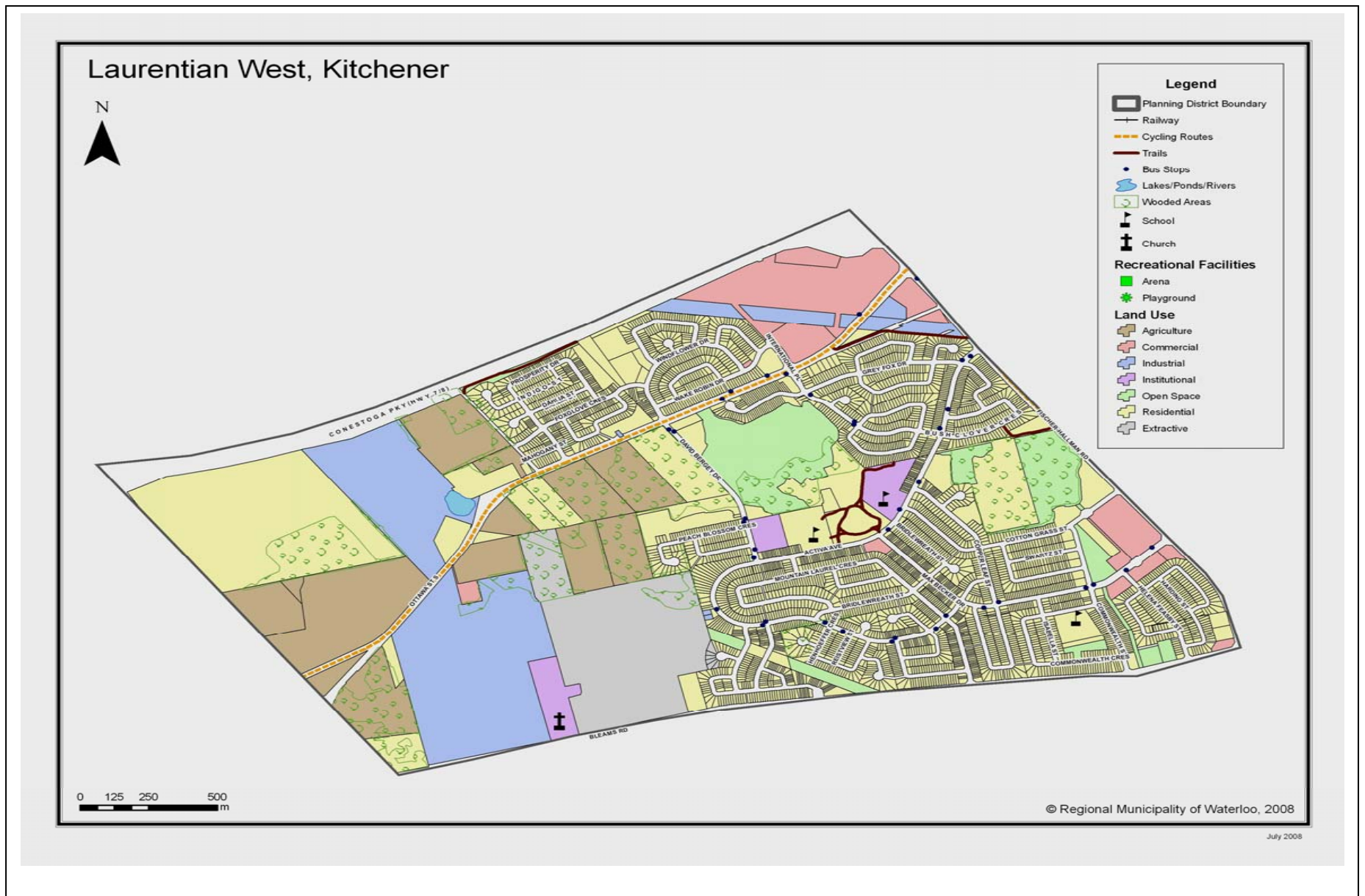
Key informant #3 also indicated that “there is a high vehicle accident ratio in the area as there are regular collisions near Ottawa/Fischer-Hallman streets.” This claim is supported by the Region of Waterloo (2007) Collision Rankings, placing this intersection area at 40 out of 100 in terms of regional collision ranking, with 108 collisions in 2007 (ROW Transportation Department 2007).

Although the neighbourhood uses various means to walk during the week, the key informant #4 noted that “Laurentian West neighbourhood residents were less likely to engage in public transit”. Bus transit use was noted by key informant #5 as “moderate for employment and recreational use, with a higher student ratio.” The bus stops in this neighbourhood are within a 5-10 minute walk, although transfers are required to get anywhere to the central downtown area, and “the Laurentian route can take up to an hour to reach downtown Kitchener, a 10-15 minute driveway away.” “The majority of adults in the area continue to make use of one or more private vehicles, given the suburban location.”

The research study documented the Laurentian West, Kitchener neighbourhood as having effective intensification with mixed uses and easy accessible walking distance to schools and amenities. Even without a structured trail system, this neighbourhood is claimed by key informant #6 to “have a very active physical activity level with walkers, joggers, and cycling”. There are well landscaped and safe parks near the schools with ample equipped park furniture for the children, and a modern senior’s residence care facility in the area.



Map 18. Laurentian West, Kitchener



Source: Region of Waterloo (2008). Liptay Thesis

## 5 ANALYSIS

The research analysis seeks to define whether urban neighbourhoods in the study support the research question, ‘what are the attributes of a healthy community?’ While meeting the research objective to verify the extent to which the neighbourhoods selected in the study replicate these attributes. The thesis explored how the selected neighbourhoods could be improved upon from a ‘healthy city’ perspective. It looked at whether there are specific land use patterns or policy that promote or discourage healthier choice and lifestyle.

### 5.1 Key Research Findings and Comparative Public Health Reports and Literature Context

The Research Key Findings Chart, (see Table 6), summarize the key points in the observational field work, key informant interview and key informant questionnaire research, with focus on existing urban form criteria in the specific study neighbourhoods. The study examined eight Region of Waterloo neighbourhood areas in a descriptive analysis to verify the extent to which the investigated neighbourhoods conform to healthy urban form attributes. Healthy community form brings together planning and community design that make it easier for people to live healthy lives.

Characteristics of the ‘healthy city’ perspective include certain modifiable built environment factors (that influence physical activity and health):

- Land Use Mix  
Promotes more opportunities to walk and use transit; for trips less than 1 km, mixed use communities generate up to 4-times as many walk trips
- Network Street Connectivity  
Poor network street connectivity reduces pedestrian mobility and trips; as the number of intersections and blocks increase, the number of walk trips increase
- Street Design  
Address street quality and amenities to support walking and cycling; trees, crosswalks, sidewalks, bikeways. Calms or discourages traffic, encourages pedestrian presence

- **Site Design**  
Design features that promote walk or bike trips include short building setbacks and neighbourhood parks and greenspace
- **Density**  
Appropriate residential and employment density are associated with increased walk, bike and transit trips (Rosenblatt 2005).

The principles encourage mixed land use and greater land density to shorten distances to encourage physical activity, provide transit to reduce the dependence on autos, build efficient pedestrian and bicycle infrastructure, including sidewalks and cycle paths, offer access to greenspace and parks, ensure affordable housing and food sources, and create community centers where people can become socially engaged (CDC 2008).

Healthy community attributes or urban form design indicators (see Table 6) used within the field work included similar variables: high density, mixed residential, commercial, industrial uses; efficient direct road network system with short block sizes, narrow streets converted to one way to improve congestion; good pedestrian connectivity; a high level of accessible and convenient public transit system to encourage physical activity and alternate modes of transport, with good wait times under 10 minutes; reduced traffic volume and adequate parking; amenities with a 5-10 minutes walking distance; parks, cycle and walking routes near the neighbourhoods, greenspace, high aesthetic landscaping and interesting places to visit along the route; incorporating safety in urban form, adequate street lighting, safe street crossings, a passive form of surveillance, good park and trail equipment-benches, play equipment, a presence of art and culture and heritage; green infrastructure in tree's and plantings to create neighbourhood character and a 'sense of place'.

The healthy community demonstrates urban form that supports the idea that socio-environmental conditions are important to health, with a belief that the built environment,



particularly infrastructure supporting transportation, has implications for health promoting behaviours.

The research findings within the study neighbourhoods indicate that the higher density areas in the downtown older neighbourhoods: Central Park, Cambridge; Mary Allen Uptown Waterloo; and Civic Central Frederick Downtown Kitchener, which have traditional grid road systems and are experiencing varying degrees of revitalization, appear to make better use of urban form that reduces reliance on the private automobile and encourage healthy practices like transit, walking or cycling. The suburban areas, Shades Mills, Cambridge; Westvale Meadows, Waterloo; Clair Hills, Waterloo; Laurentian West, Kitchener; and Country Hills West, Kitchener, with a lesser degree of healthy community form indicators, were seen to counteract the goal toward healthy living by not fully embracing healthier lifestyle choices.

This supports the McCormick (2006) public health study of 72 Waterloo Region neighbourhoods, *Compilation of Data Relating to Urban Neighbourhoods in Waterloo Region*, which emphasizes efficient urban design and neighbourhood health. The Schumilas (2007) public health report, *Healthy Growth: Health and The Built Environment*, supports the thesis research findings in recognizing the impact of community planning and the aspects of the built environment on health associated with population growth. Key areas of focus are on: increasing reurbanization, reducing vehicle use, improving walkability and air quality.

Schumilas (2007) supports the McCormick (2006) report and makes references to the widening gap in health disparities within Regional neighbourhoods. Schumilas associates an increase in physical activity through neighbourhood urban design as having significant impact on health. This compares to Frank et al (2006) in his claim that even a 5% increase in the walkability of a neighbourhood can be associated with a ½ kg weight reduction, a 6.5% reduction in per capita vehicle kilometer traveled and a 5.5% reduction in ozone precursors (Frank et al, 2006).

The thesis research findings conclude that the centre core study areas have a higher level of residents walking during the week, engaging in public transit for employment, school and recreational uses. Inner-city neighbourhoods spend significantly more of their time walking doing errands and getting from place to place. This supports the Fisher (2005) public health report, *Urban Form, Physical Activity and Health* who recognizes that purposive walking in the inner-city neighbourhoods is made possible by the greater number of destinations in those areas.

Alternative transportation methods were used more frequently in the centre core neighbourhoods, such as cycling, car-share or car-pool. On the other hand, suburban residents walk more for recreational reasons and on weekends. Suburban residents drove private auto's more than the centre core residents, and utilized public transit to a lesser degree. These findings support the public health Travel Patterns Survey (Fisher 2005), which states that respondents from inner-city neighbourhood are significantly less likely to own or lease a vehicle (2% versus 14%) and respondents from suburban neighbourhoods are more likely to own at least three or more vehicles (23% versus 9%). Despite similar commuting distances to employment or school, respondents from suburban neighbourhoods spend more time in a car per day (73.8 minutes) than those from inner city neighbourhoods (42.0 minutes).

This is significant because those who drive for more than thirty minutes a day were found to be 1.64 times more likely to being overweight than those who drove thirty minutes or less each day, regardless of which neighbourhood they live in (Fisher 2005). This also appears to support Ewing (2003) who proposed that individuals who live in sprawl car-dependent neighbourhoods are likely to walk less, weigh more and suffer from obesity, high blood pressure and other health disease.

In one newer suburban area, Laurentian West, Kitchener, there does exist high density in the area, and good mixed use, which demonstrates a high level of characteristics for

healthy neighbourhood design, and encourages active choices like transit, cycling and trail use. The challenge, however, within this newer suburban neighbourhood, similar to other suburban areas in Waterloo Region, i.e. Clair Hills, Waterloo, is that transit has not met the needs adequately with less than convenient transfer stops or one hour bus rides to the downtown or uptown areas.

Suburban neighbourhood areas need to be more transit accessible and more convenient to use. The Laurentian West, Kitchener neighbourhood, however, as a suburban example of the first neo-traditionally community plan design within the Region of Waterloo, in comparison to the other neighbourhoods, indicates the most successful suburban urban form plan to date. An indication of this is the higher population and mixed use density present.

The three centre core neighbourhoods all demonstrate similar population density, with a slight decrease or maintained stability in the last five years, possibly due to restructuring or revitalization efforts through regional and local growth management initiatives, with potential for significant additional growth. The trend in the last five years is to increase centre core residential density by 40%, prompted by the provincial government growth plan. The call for revitalized reuse of older abandoned manufacturing buildings is a significant factor in any centre core reurbanization, and an awareness of alternating aged demographic and different housing needs. Some older suburban areas in the study demonstrated balanced density numbers although presently lacked efficient transit connectivity and mixed land use i.e. Westvale Meadows, Waterloo.

The population density in the newer suburban areas such as Laurentian West, Clair Hills and Shades Mills (the south section, newer suburban area) appear to embrace the higher population density numbers, perhaps as a result of newer neo traditional urban form planning.

**Table 6, Research Key Findings**

**DOWNTOWN AREA:**

Urban Area	Density	Road Network System	Public Transit	Traffic Volume	Amenities	Greenspace Pedestrian Design	Safety Design
<b>Central Park, Cambridge</b>	<p><b>Population: 9210 - 2006</b></p> <ul style="list-style-type: none"> <li>▪ <b>High density</b></li> <li>▪ 2300-3200 people per square kilometre</li> <li>▪ <b>Mixed</b> residential, employment buildings</li> <li>▪ Older revitalized downtown area.</li> <li>▪ 100 years in downtown Cambridge</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Direct route street, Short block size</b></li> <li>▪ <b>Grid</b> road system 17-28, 4 way stops per kilometer</li> <li>▪ Frequent stop lights</li> <li>▪ Railway in use</li> <li>▪ Good pedestrian connectivity</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>High Use</b></li> <li>▪ Accessible</li> <li>▪ Frequent downtown Transit, ixpress bus</li> <li>▪ Good wait time under 10 minutes</li> <li>▪ Transit terminal close location</li> </ul>	<ul style="list-style-type: none"> <li>▪ Heavy traffic volume</li> <li>▪ Congested downtown area</li> <li>▪ Limited downtown parking</li> </ul>	<ul style="list-style-type: none"> <li>▪ Grocery store, walking trail along river</li> <li>▪ Within short walking distance Rec centre</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>High</b> urban trails along waterway</li> <li>▪ Cycling trail along Rail, downtown route along Hamilton St.</li> <li>▪ Moderate Aesthetics.</li> <li>▪ Ongoing downtown revitalized area</li> <li>▪ River attractive</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adequate street lighting, safe street crossing.</li> <li>▪ Surveillance or presence of local police is not as evident as city of Kitchener or Waterloo</li> <li>▪ Good trail equipment; benches, lighting, near the river trails</li> </ul>
<b>Mary Allen, Uptown Waterloo</b>	<p><b>Population: 7750 - 2006</b></p> <ul style="list-style-type: none"> <li>▪ <b>High</b> population density 2300-3200 people per sq. kilometer</li> <li>▪ <b>Mixed use</b> residential, employment commercial.</li> <li>▪ Older single use housing, large frontage lots. Parking at rear. Mix conversion use into apts.</li> <li>▪ One of oldest city neighbourhood areas</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Direct route, Grid</b> road system</li> <li>▪ Short block size, 17-28 4 way stops per kilo.</li> <li>▪ Narrow streets, converted to one ways to avoid congestion,</li> <li>▪ Pedestrian connective</li> <li>▪ Railway in use</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Highest</b> level of accessible</li> <li>▪ Frequent, high transfer</li> <li>▪ Good wait time-under 10 minutes</li> <li>▪ High use for employment school and recreational</li> <li>▪ Convenient</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate to high traffic volume through central uptown waterloo</li> <li>▪ Adequate parking.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Amenities recreation centers within walking distance</li> <li>▪ Parks close by</li> <li>▪ Grocery and stores within walking distance</li> <li>▪ Active environment</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>High</b> urban walk trail system along rail, silver lake</li> <li>▪ High use cycle trails via uptown</li> <li>▪ Small green space</li> <li>▪ Moderate to High Aesthetics</li> <li>▪ Revitalized areas support activity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Strong safety design; main and side street lighting, street crossings, surveillance, through open street café's</li> <li>▪ Active environment</li> <li>▪ Neighbourhood parks/equipment, sheltered high plantings not safe</li> <li>▪ Uptown weather protection</li> </ul>

Urban Area	Density	Road Network System	Public Transit	Traffic Volume	Amenities	Greenspace Pedestrian Design	Safety Design
<b>Civic-Central Frederick, Downtown Kitchener</b>	<p>Pop: 3595 - 2006</p> <ul style="list-style-type: none"> <li>▪ <b>Low</b> density</li> <li>▪ <b>Mixed</b> use, residential, commercial, employment</li> <li>▪ Single older housing, mixed converted single into commercial use</li> <li>▪ 50+ year old residential area</li> <li>▪ Current streetscape revitalization</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Moderate Direct route</b> connectivity</li> <li>▪ <b>Grid</b> street system</li> <li>▪ Short block size, 17-28 4 way stops per kilometer</li> <li>▪ Narrow side streets</li> <li>▪ One way streets to reduce congestion</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Moderate to High</b> downtown accessible</li> <li>▪ Used for employment and recreational use</li> </ul>	<ul style="list-style-type: none"> <li>▪ High traffic volume in downtown centre streets and side streets</li> <li>▪ Parking is limited</li> </ul>	<ul style="list-style-type: none"> <li>▪ Amenities within walking distance</li> <li>▪ Close to Victoria Park</li> <li>▪ Close to recreation connects, Kitchener Aud. And City hall,</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Non existent</b> trail or cycle system</li> <li>▪ 1 small trail next to Edna St. park</li> <li>▪ Limited green space</li> <li>▪ Moderate aesthetic</li> <li>▪ Older homes low to moderate attractive landscape</li> <li>▪ Vacant stores</li> </ul>	<ul style="list-style-type: none"> <li>▪ Good street lighting, street crossings</li> <li>▪ Surveillance with local police on main downtown streets</li> <li>▪ No weather protection at transit stops</li> </ul>

**SUBURBAN AREA:**

Urban Area	Density	Road Network System	Public Transit	Traffic Volume	Amenities	Greenspace Pedestrian Design	Safety Design
<b>Shades Mill, Cambridge</b>	<p>Population: 14300 - 2006</p> <ul style="list-style-type: none"> <li>▪ <b>High population density.</b> 2300-3200 people per sq.kilo</li> <li>▪ Older single detached houses, low density in housing use, large frontage lots.</li> <li>▪ New mixed housing area has higher density. 30 year+ age</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Moderate direct connect</b></li> <li>▪ Older <b>Grid streets.</b> Short block sizes; new mixed, longer</li> <li>▪ One ways, traffic calming bumps/signs in older area.</li> <li>▪ <b>Newer mixed</b> housing, <b>cul-de-sac road</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ 10 minute walk to transit stops, too far apart</li> <li>▪ <b>Not accessible</b> or utilized frequently</li> <li>▪ Low employment use</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate traffic volume</li> </ul>	<ul style="list-style-type: none"> <li>▪ Amenities not close.</li> <li>▪ Shades Mill Conservation area is close yet driven to</li> <li>▪ Small cycle numbers</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>High physical activity</b> walk trails</li> <li>▪ No formal cycle trails</li> <li>▪ High green space conservation area, ample parks shades mill lake</li> </ul>	<ul style="list-style-type: none"> <li>▪ Good street lighting on neighbourhood streets</li> <li>▪ Good street crossings, street calming</li> <li>▪ Neighbourhood watch program in place. Good recreational park equipment.</li> </ul>

Urban Area	Density	Road Network System	Public Transit	Traffic Volume	Amenities	Greenspace Pedestrian Design	Safety Design
<b>Westvale Meadows, Waterloo</b>	<p><b>Population: 6430 - 2006</b></p> <ul style="list-style-type: none"> <li>▪ <b>Moderate - High</b> population density 3200 people per square kilometer</li> <li>▪ Young families</li> <li>▪ Mixed housing; single, semi, townhouse.</li> <li>▪ Neighbourhood 30 years old.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Ring roads, cul-de-sac road</b> system</li> <li>▪ 2-6 4 way stops per kilometre</li> <li>▪ Long block sizes, <b>non direct connectivity</b></li> <li>▪ Sidewalks on one or both sides of sidestreets</li> <li>▪ Narrow side streets</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Good accessible</b> bus transit</li> <li>▪ 10 minute walk, wait, easy transfer -downtown Waterloo</li> <li>▪ Moderate to high bus transit use; employment school, recreation</li> </ul>	<ul style="list-style-type: none"> <li>▪ High private vehicle traffic volume</li> </ul>	<ul style="list-style-type: none"> <li>▪ Amenities 1 km walking distance</li> <li>▪ Vehicle or transit used for transfer to recreation facilities, parks</li> <li>▪ Local schools daycare centres</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Some walking trails</b>, no formal cycle routes,</li> <li>▪ Limited greenspace</li> <li>▪ Moderate attractive areas to encourage physical fitness.</li> <li>▪ Primary residential neighbourhood</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adequate lighting near transit stops</li> <li>▪ No lightning and high fence through informal community trail</li> <li>▪ Good street crossing at intersection and school areas</li> <li>▪ Neighbourhood watch in place</li> <li>▪ Limited park equipment</li> <li>▪ Adequate weather protection</li> </ul>
<b>Clair Hills, Waterloo</b>	<p><b>Population: 10985 - 2006</b></p> <ul style="list-style-type: none"> <li>▪ <b>High density</b> population</li> <li>▪ Large single detached, higher end price houses</li> <li>▪ New neighbourhood development under 10 years</li> <li>▪ Limited mix land use, primary recreational</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Moderate direct route, combination grid and cul-de-sac</b> street design</li> <li>▪ 2-6 4 way stops per kilometre</li> <li>▪ Long block sizes</li> <li>▪ Narrow side streets, no parking near school</li> <li>▪ Very wide gateway road width, high aesthetic</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Not accessible</b></li> <li>▪ 10 min. walk to stops, ½ hour transfer, 1 hour bus-downtown</li> <li>▪ Low transit use, primary students</li> </ul>	<ul style="list-style-type: none"> <li>▪ High private vehicle traffic volume</li> </ul>	<ul style="list-style-type: none"> <li>▪ Formal trails and parks, ski and hike</li> <li>▪ Majority drive to recreation activities or events within the city of Waterloo core</li> <li>▪ Grocery and amenities drive outward</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Ample trails</b> and greenspace</li> <li>▪ Cycle trail to Columbia street</li> <li>▪ High aesthetic</li> <li>▪ Attractive entrance, trails, forest areas</li> <li>▪ Doesn't encourage physical activity beyond area to remote location.</li> </ul>	<ul style="list-style-type: none"> <li>▪ At time of study interview, safety park and trail lighting was not installed</li> <li>▪ Neighbourhood watch in effect</li> <li>▪ Good street lighting.</li> </ul>

**SUBURBAN AREA:**

Urban Area	Density	Road Network System	Public Transit	Traffic Volume	Amenities	Greenspace Pedestrian Design	Safety Design
<b>Laurentian West, <u>Kitchener</u></b>	<p><b>Population: 11230 - 2006</b></p> <ul style="list-style-type: none"> <li>▪ <b>High density</b> 1300 people per sq. kilo. (significant growth since 2001)</li> <li>▪ Mixed use area, newer housing. residential, commercial, institutional (schools, residences and seniors residence)</li> <li>▪ Neighbourhood 10 years developed</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Non direct route, crescent cul-de-sac,</b> loop road system</li> <li>▪ Long block sizes. Multiple 4 way road stops. 2-6 4 way stops per kilo.</li> <li>▪ High number of courts, no or limited sidewalks</li> <li>▪ Adjacent to busy arterial roads, Fisher-Hallman/Ottawa Sts and Hwy 7/8 cutoffs</li> </ul>	<ul style="list-style-type: none"> <li>▪ 5 minute walk to stops</li> <li>▪ <b>Not convenient</b></li> <li>▪ ½ hr to bus transfers, 1 hr bus downtown</li> <li>▪ 1 bus route in area #22 Laurentian, lengthy ride</li> <li>▪ Moderate to high student usage, to bus downtown</li> </ul>	<ul style="list-style-type: none"> <li>▪ High traffic volume off highway into residential area</li> <li>▪ Ongoing side street congest and street parking</li> </ul>	<ul style="list-style-type: none"> <li>▪ Amenities within 1 km walking distance to ‘smart centre area’</li> <li>▪ Majority still drive to avoid unsafe 4 way highway cutoff and intersect area</li> <li>▪ 15 minute drive to downtown recreation centres, jobs</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Moderate formal trails</b></li> <li>▪ Cycle route Ottawa St. conflict with busy transit / Hwy 7 ramp</li> <li>▪ <b>Physical activity high,</b> bike /walk/ jog sidewalks/rd</li> <li>▪ Path to amenities ½ km walk</li> <li>▪ Moderate landscaping mixed uses</li> <li>▪ Parks well equipped near school</li> <li>▪ Wooded areas</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adequate street lighting on neighbourhood side streets, intersection street crossings, 4 way crossings and near schools</li> <li>▪ Open space recreational park area with good park equipment</li> <li>▪ Bus transit stops do not have adequate weather protected areas</li> <li>▪ Fischer-Hallman / Ottawa St. intersection area has inadequate street crossing signals with expansive road separation.</li> </ul>
<b>Country Hills West, <u>Kitchener</u></b>	<p><b>Population: 4180 - 2006</b></p> <ul style="list-style-type: none"> <li>▪ <b>Low density</b> population</li> <li>▪ Mixed housing; single, semi, townhouses, condominiums</li> <li>▪ 50+ year old neighbourhood area</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Non direct route, cul-de-sac,</b> ring roads</li> <li>▪ Long block sizes, not easily connective</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bus transit accessible, <b>used regularly</b></li> <li>▪ Moderate employment and school use</li> <li>▪ Bus stop 10 min. apart</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate traffic volume</li> <li>▪ Little congest-ion with wide street areas</li> </ul>	<ul style="list-style-type: none"> <li>▪ Small mini mall amenities under 1 km.</li> <li>▪ Rec centre close by <b>actively used</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Low to moderate</b> 1 trail near school area</li> <li>▪ No formal cycle trails</li> <li>▪ Wooded and greenspace park near school</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trail path not lighted or fenced</li> <li>▪ Good lighting on area streets</li> <li>▪ Good street crossings</li> <li>▪ Good weather protected areas for bus transit</li> </ul>

Source: Liptay (2008)

The road system in all research downtown core areas is typical of an older grid system with good pedestrian connectivity. There are frequent intersection stops and a high number of short blocks, which overall represent adequate direct route systems. In contrast, the suburban street design indicates a combination of cul-de-sac, loop and grid streets. The older neighbourhood grid areas have one way stops built in an effort to reduce vehicle congestion i.e. Mary Allen, Waterloo, and Shades Mills, Cambridge. The connectivity in the suburban urban design have moderate to low direct connectivity for pedestrians, and therefore present challenges in getting residents out of their private vehicles, embracing more active healthier choice, particularly when transit is not as efficient or frequent.

Without adequate neighbourhood urban design that supports healthier active living, community health will continue to decline. This is echoed in a Statistics Canada Survey (2005) which documents clear links between reduced health outcomes with living in a peripheral neighbourhood through auto dependence as the primary mode of transportation for daily travel.

In the last fifty years, suburban neighbourhood design has been more conducive to the automobile than the pedestrian. The newer suburban design areas, such as Clair Hills, Waterloo, have done to balance this location and transit discrepancy, is to implement trails, close connection of amenities, good focus points along the way, increase cycle paths that encourage physical activity even from a recreational viewpoint. This will support some criteria for healthy neighbourhood design, although the key to success includes the transportation connection, accessibility and convenient suburban neighbourhood transit.

In the neighbourhood study, transit use presented the most challenge in the suburban areas of the newer neighbourhood, i.e. Clair Hills, Waterloo, with low to moderate use of the bus transit. By virtue of the area distance from the centre core, which was significant; accessibility and convenience of service remains low. Most Clair Hills residents drive private vehicles to outer



destinations. However, even in this newest suburb, the potential for change or increased use of transportation alternatives exists through the design of closer amenity concepts such as the ‘smart centre’, or through future transportation alternatives like rapid transit. The potential for different results several years down the road is feasible. The majority of suburban neighbourhood areas made use of one or two private vehicles, and sometimes three, as in Shades Hills, Cambridge. The private auto continues to present affluence and convenience in contemporary society, and even with a slow environmentally conscious cultural shift, will remain on some level.

Research key findings indicate high transit use in the centre core areas, accessible, convenient and easy to use transit with good connectivity, and used at a high level for employment, school and recreational use. The uptown-downtown residents embrace and utilize links for walking, bus transit, cycling and regular use of the terminal transit station bike lockers and urban bike racks.

What was apparent in both the city core and suburban neighbourhood areas is that there has been in place, in particular over the recent five years, a conscious planning effort towards increased trail implementation and cycle path development. The placement of formal or structured walking or hiking trails, or cycle road system in the Region of Waterloo has been a sustained and conscious effort. The trend indicates a cultural shift not only in local policy but in the way residents increasingly embrace physical activity into their lives.

In the research analysis, it appeared that it was those urban areas that increased urban form aesthetics in any revitalization effort, along the route, that saw an increase in some residents wanting to get out and engage in an active lifestyle i.e. uptown Waterloo area and its increase in outdoors cafes, cycle racks, streetscape aesthetics, places to go, places to see, places to gather in the centre core, it all embraces the use of physical activity. This was increasingly evident, to varying degrees in all centre core areas undergoing revitalization.

Throughout the study of older and newer neighbourhoods, suburban and centre city core areas, there is the recognition that a healthy neighbourhood creates the context for regions that are sustainable, integrated and coherent. This implies the integration of protected natural systems, green infrastructure, vibrant centers, human scale circulation systems, a common civic realm and integrated diversity. Regional and neighbourhood design have distinct parallels. Pedestrian scale within the neighbourhood includes walkable streets and nearby destinations, and has a partnership in transit systems at the regional scale.

Transit can organize the region in a similar way that a street network organizes a neighbourhood. Crossing local and metropolitan scales, transit supports the life of the pedestrian within each neighbourhood by providing access to regional destinations. Likewise, pedestrian friendly neighbourhoods support transit by providing easy access for riders. The two scales, if designed as parallel strategies, reinforce each other.

Local urban centre cores within the Region of Waterloo continue to aim for mixed use, walkable civic places. This calls for more intensity, inclusive, diverse and activity than smaller regional counterparts. The centre core areas benefit from transit service and become the cultural and economic focus of the region and transit centre hub. Like transit, walkability is important. Calthorpe et al (2001) recognized that the higher the frequency of street intersections, the more direct the walking route will become. The greater the densities of jobs, the more destinations close at hand there will be to walk. Combine these two measurable factors and you have an index that quantifies the walkability of an area. Roads and transportation systems have always provided the fundamental structure of human habitat in cities and regions.

The direction in which corridors grow and their diversity define the character and future of the region. If you create an area that is easy to walk around but has no significant destinations, people will drive. Master planned communities that create these areas by investing in extensive

trails and bikeways that are great for recreation but are too remote from commercial areas, create a scenario where residents have a place to walk, but nowhere to go i.e. Clair Hills, Waterloo.

Alternatively, if you create mixed use areas with desirable destinations but make it a pedestrian's challenge, people will still drive i.e. Laurentian West, Kitchener. Neighbourhoods like this appear to be marketed on some aspect of uniqueness (Sandalack 2005), where the distinction is emphasized by the edges of new communities which are defined by high-volume collector roads, with huge land buffers on either side. Sometimes just crossing one of these requires getting in the car. Laurentian West, Kitchener neighbourhood, corner to Fischer-Hallman and Ottawa streets in Kitchener, is a primary example, situated adjacent to a 4-lane highway crossing and Highway 7/8 cutoff. It presents an example of an activity centre, a good mixed area but separated by large arterial streets and parking lots, has destinations but not a convenient, safe or formal walkable environment. This compares with a recent urban form walkability study (Fisher 2005), where inner-city and suburban neighbourhood respondents identified that busy streets made walking difficult for the residents, as well, as poor weather, sidewalks in poor condition.

The key findings indicate the need for change in neighbourhood land use. Changes in land use patterns are possible in today's urban areas. The question is whether the density, mix and development shift can be enough to change individual behaviour or practices. Through shifting demographics, it is possible, with an emerging desire for a different quality of life that form a foundation for new land use patterns.

An indication of this cultural shift in Waterloo Region demonstrates that the younger generation choosing to live in centre core urban neighbourhoods close to city centers and revitalized areas, with a conscious effort to embrace reurbanization and increased transit. This new generation are seeking out compact, walkable neighbourhoods supported by urban services,

just when the need for transit oriented development and denser housing is maturing. Regional vision, policies or investments need to begin shaping the community at the most basic level, the neighbourhood.

Overall, the centre core Mary Allen Uptown Waterloo neighbourhood presented the highest level of attributes related to effective healthy urban form in presenting a good level of mixed use; residential, commercial, industrial, close amenities to the parks and shopping within a 5-10 minutes walk, a public meeting place, varied mixed use housing type, close to uptown Waterloo easy and accessible public transit, effective cycle and walking trail routes, efficient street network narrower one way streets, supportive by ample sidewalks. The area also benefits from the nearby location of uptown Waterloo, supporting lively outdoor cafés and character of the community environment in the public square development.

Through careful planning of the attributes that create healthy neighbourhood urban form, and through this study comparative of eight neighbourhoods in the Region of Waterloo, local planners have an opportunity in the few remaining planned suburban areas, to incorporate these criteria and learned experience into remaining new subdivision planning. The idea is to embrace neo-traditional planning in development and preservation of walkable pedestrian environments with effective street network systems that include efficient public transit and alternative modes of transport. It is about reducing and maintaining any level of sprawl in the recognition that high density and mixed use contribute to creating and maintaining healthy communities, while encouraging healthy options and healthy lifestyle choice.

## **5.2 Study Findings Relevant to Existing Land Use and Policy Context**

The findings within the research neighbourhood study address a need to create more efficient urban form in order to generate healthy, active and sustainable community lifestyles. Challenges in neighbourhood urban form still include: congested roads, on-street parking,

parking takes up land space, connectivity and accessibility to public transit, parks and trails. The study findings result in the need to; create more connective and linked communities and to design efficient street networks, either grid or fused pedestrian oriented with shorter blocks for more direct routes. The need is here to further establish and improve formal trails and introduce specific cycle routes within the neighbourhood to provide links to other regional areas, increase mixed use with higher density to increase walkability and transportation alternate.

As well, to implement efficient and convenient public transit which will increase transit use and varied modes of travel, with particular emphasis on existing suburban areas which require a restructured convenient transit system. Improved presence of close ‘amenity centres’ to reduce the need to drive. Revitalization of centre core areas will increase walkability, while aesthetically attractive and active areas will allow residents to feel safe and connected, engage in active living and encourage social engagement.

What is required is a planning support system that index tools to measure existing conditions, evaluate alternative and support implementation of adopted urban form plans (Rosenblatt 2005). The research key findings are relevant to an existing array of regional and municipal policy with a directive towards sustainable communities, supporting the province’s *Smart Growth Theory (2005)*. Related regional and city initiatives include: *Regional Official Policy Plan (2009)*, *Regional Growth Management Strategy (2003)*, *Master Transportation Plan(2009)*, *The Station Area Plan Pilot Project (2008)*, *Regional Energy Model and Emissions Reduction Plan (2008)*, *Cycling Master Plan (2004)*, *Pedestrian Charter (2005)*, *Cultural Heritage Landscapes (2005)*, and various municipal plans: *Growth Management Strategy*, *Design and Development Plans*, *Core Revitalization Plans*, *Height and Density Policy Plans*, *Community Development Plans*, *Heritage and Environmental Strategic planning*.

Current municipal and regional policy and plans emphasize long term management of growth through a balanced approach with focus on the environment, community land use design, transportation, economy, street connectivity, and community linkages. Much of the municipal and regional plans and policy supportive of sustainable change, addresses land use and development. Deciding where new development should or should not occur. Ensuring that development does not proceed beyond the urban fringe or near rural lands, encouraging reuse of land and urban redevelopment and brownfield rehabilitation. Policy that will encourage compact growth and remove barriers to it, emphasizing higher efficiency of land already developed in older urban areas and suburban area improvements.

An area of emphasis in promoting more effective land use looks at how land use planning fits into transportation planning. Land use planning decisions are currently made at the local level, however these decisions have a direct impact on transportation i.e. urban sprawl promotes auto use and reduces public transit use. Transportation policy must align with land use policy through effective partnership.

Land use growth policy that intertwines with transportation policy can positively promote alternative travel modes and active living. Improved transit, whether bus service or future rapid transit, is one way to adapt to land use patterns. Transit service will need to expand as population and employment distribution changes. Formalized trails and cycle routes must complement neighbourhood design in promoting a healthier active neighbourhood lifestyle.

Land use planning decisions are essentially a reflection of zoning and development. Zoning codes and development standards require conventional restructuring. Traditionally, standards allow for liberal road and parking capacity, and it encourages lower density, urban fringe development where land is cheaper. When we think of redevelopment in the neighbourhood area, best efforts will prove futile unless there is reform of the local zoning codes, with parking and

roadway design standards. Recent regional and municipal policy plans support alternative development standards: compact development, narrower lots, narrower roads, introduction of sidewalks, roads in a grid or mixed grid pattern, rear lanes, on street parking, mixed use for the main street, neighbourhood employment and amenities centres close by, higher road grades, that follow natural topography.

Development restructuring also includes a re-alignment of growth related costs in local development bylaws. Restructured development charges should include parking charges for centre core area development but also intensification allowances, based on long range growth forecast and service levels.

The benefits of restructured zoning and development would underscore improvements required and highlighted in the key findings of the research study: the need for more efficient infrastructure, less dependence on automobiles, road design through traffic calming, pedestrian friendly areas, improved streetscape, increased safety, open space preservation, increase community connectivity, more accessible shopping and employment areas, and less disturbance to natural land forms. In order to make neighbourhood communities healthy and support sustainable urban design, Smart Growth plans and policy strategy will need to reinforce collaborative municipal, regional and provincial level planning.

## 6 CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Findings Relevant to Planning Practice

The finding within the research present an opportunity for change in planning practice towards mixed land use, network connectivity, street and site design, increased density and supportive public transit, to support healthier behaviour choice and healthier community form. The direction towards intensified and compact urban form at the community level administered through the Province of Ontario's *Smart Growth Plan* (2005) provides opportunity to redefine what a healthy community is and promote urban form that will support this vision. The Ontario *Planning Act* (2005) (Section IV) supports secondary plans (new development) and community improvement plans which focus on areas that require redesign and redevelopment. Chapter V of the *Planning Act* (2005) describes land use planning system reform with focus on zoning and site plans, as a key to manage planning practice change.

The *Provincial Policy Statement* (2005) (Section III of the *Planning Act*), provides direction on land use planning and development and includes “enhanced policies on key issues that affect our communities, such as: the efficient use and management of land and infrastructure; protection of the environment and resources; and ensuring appropriate opportunities for employment and residential development, including support for a mix of uses (Province of Ontario 2005). The *Planning Act* provides the basis for preparing official plans and policies that guide future development. As well, regulates and controls land uses through zoning bylaws and minor variances. While the provinces provides direction and advice to municipalities on land use planning issues, it is generally up to local municipalities to make decisions on municipal plans that determine the future of their communities (Province of Ontario 2005).

The direction and need to plan for and create healthy complete communities is further established in the Province's *Places to Grow Growth Plan* (2006). Section 2.2.7 of the Growth



Plan recognizes the appropriate planning, designating and zoning of greenspace that contributes to creating healthy communities: create street configurations, densities and an urban form that supports walking, cycling, and the integration and sustained viability of transit service; provide a mix of land uses to support vibrant neighbourhoods; and create high quality public open space with site design and urban design standards that support opportunities for transit, walking and cycling (Province of Ontario 2006).

Key to healthy urban form development supplement to area development fees and property taxes, are funding resources that encourage healthy community form. The August 2009 TDM Grant program provides financial assistance to Ontario municipalities for the development of transportation demand management related initiatives, in order to reduce vehicle trip numbers and kilometers travelled, to promote transit and provide incentives to increase transit ridership.

In June 2009, the Ontario Ministry of Health promotion has developed a new framework for building healthy communities in Ontario and launched a new Healthy Community Fund (HFC) that replaces the former Communities in Action Fund. The HFC fund focuses on increasing physical activity within the community but also has a more integrated approach to deliver programs that will improve the health of Ontarians through addressing risk factors. The new program supports initiatives at the local level, such as ‘supporting active transportation and improving the built environment’ (Ontario Ministry of Health 2009).

Taking an integrated approach to these factors, inclusive of the varied government planning initiatives, will assist to make Ontario communities healthier.

## **6.2 Findings Relevant to Planning Practice in the Region of Waterloo**

Within local municipalities, including the Regional Municipality of Waterloo, a range of plans that complement the Ontario *Growth Management Strategy (2005)*, supports ‘building vibrant urban places’, and provides the foundation to create healthy community form. Regional

sustainable growth plans concentrate on revitalization for intensified mixed use development, innovative ideas on street design, neighbourhood and regional connectivity.

The Region's *Strategic Focus for 2007-2010* encourages compact urban form, reurbanization and mixed use development consistent with the goals of the *Regional Growth Management Strategy (2003)*. Through this focus it will work with area municipalities to develop reurbanization tools such as development charge grants, community improvement plans and tax increment financing programs.

The research findings highlight the need for regional plans that promote cycle and pedestrian infrastructure, improving neighbourhood linkages, providing priority to non-motorized transportation, expanding community activity through parks and greenspace and increasing public transit use. While encouraging mixed land use and greater land density that will shorten travel distance between residences, employment, schools and recreation so residents can walk, cycle, take transit more conveniently.

The Region of Waterloo would do well to consider a (GIS) urban form health assessment tool to develop an evidence based prototype tool that would systematically identify the public health impact of the built environment in the Region. In this, the goal would be to promote the development of healthier built environments, and using the tool's statistical relationships, develop appropriate health, and urban form policy. Similar North American (Seattle, Atlanta) results look at substantial 3-5% increase in walkability, a redirection in 6.5 per capita vehicle kilometers traveled and 5.5% reduction in ozone precursors (Region of Peel 2005). The urban form health assessment tool requirements include: evaluating land developing alternatives, evaluate at a small scale (the neighbourhood), flexibility to incorporate outcomes and land use measures based on research, and ability to incorporate health and air quality outcomes utilized in the built environment (Region of Peel 2005).

Current urban planning practice in the Region of Waterloo does aim toward efficient, accessible and convenient mass transit to reduce the dependence on automobiles. Building good pedestrian and bicycle infrastructure is required, as well as inclusion of sidewalks and cycle paths that are safely removed from auto traffic, and good right of way laws with clear easy to follow signage requirements. Neighbourhood safety calming measures and aesthetic focal points will also increase residential confidence in engaging in a physically active lifestyle.

In order to promote healthier urban form, individuals must have the choice of pedestrian alternatives like walking, cycling and public transit. There is a reason to believe that people who reside in areas that have more destinations to walk to, will walk more, and make more use of transportation alternatives. If the regional urban form patterns do not change, then we will end up with poorer community health resulting from heightened level of congestion and reduced air quality.

Regional transit investments also need to support new urban form in land use decisions. Infrastructure shifts must take place in zoning and development. Zoning maps that dictate growth and redevelopment must be reformed into policy that recognizes and reinforces connections between uses. Local policy change can bring about new basics for planning communities rather than merely zones. Neighbourhood development should emphasize greater access to greenspace and parks, while encouraging central community centre focal points where residents can socially engage as part of their daily routine.

Traditionally in the subdivision process, the planning board or commission reviews the design and divided parcel map and reviews the development plan for infrastructure, utilities and environmental impacts, and design of a site. Conditions are then attached to the project in what is to be built, site design, highway connections, amenities, financing arrangements. It is at this point that subdivision plans need to look at off-site traffic impacts, congestion, alternate transport and

walkable linkages, with the idea of creating healthy neighbourhood form. The idea is to have planning bodies get away from the assumption that the personal auto will be the transport mode of choice (Kushner 2007).

And in this redirection of auto usage, support for pedestrian transit oriented communities can be encouraged by reduced auto use, which must take place in order to address the auto negative externalities. In 2007, Ipsos Reid formulated a public opinion survey within the Region of Waterloo on transportation management, which indicated that 55% - 58% local residents would alter their transportation behavior if there were improved transit options in the Region. The opinion poll compared results from an earlier survey taken in 1997, which indicated a significant change in opinion towards transportation behaviour change.

Citizens are going to be more receptive to alternative modes of transportation if the urban design of an area is conducive to that, and offers a certain level of accessibility and convenience. Regional planners need to address the health context of urban design that has contributed to a decline of health in neighbourhoods. Community wide educational programs can market increased physical activity within the community to introduce healthier practices and perceptions.

For Regional planning practice, this requires a new vision towards a new set of values in healthier neighbourhood urban form. Through more effective design and building of healthy community environments, planning can improve air quality and reduce certain health outcomes related to lack of physical activity, create opportunity for citizens to make healthier choices. Municipalities have been given the tools from the province that they need to influence and reshape communities to develop compact integrated and sustainable neighbourhoods.

### **6.3 Findings Relevant to Planning in the Research Study Neighbourhoods**

The research findings within the specific research study neighbourhoods: Mary Allen Uptown, Clair Hills, Westvale Meadows, Waterloo; Laurentian West, Civic Central Frederick,

Country Hills West, Kitchener; Shades Mills and Central Park, Cambridge, provide a perspective on centre core, suburban and newer suburban urban design.

The findings are relevant in providing a descriptive analysis into healthy urban form and addressed the research question, ‘what are the attributes of a healthy community’, and covered the objective to verify the extent to which the neighbourhoods selected in the study replicate these attributes. The thesis explored how the selected neighbourhoods could be improved upon from a ‘healthy city’ perspective. It looked at specific land use patterns or policy that promote or discourage healthier lifestyle, and answered the question, ‘are their healthy neighbourhood communities within the Region of Waterloo,’ thereby conveying that among the study neighbourhoods, the community of Mary Allen, Waterloo surpassed other neighbourhood study areas and largely incorporates healthy city attributes to embrace the healthier lifestyle.

In reference to the comparative change in population density within the 8 study neighbourhoods from 2001 to 2006, within the 5 year time period, this indicates a decrease, while overall maintaining density in the centre core neighbourhoods; Mary Allen, Waterloo, Central Park, Cambridge; Civic Central Frederick, Kitchener. All of the centre core neighbourhoods are undergoing restructuring and revitalization, and have potential for future increase with the focus on increased core intensification, reurbanization and transit oriented development.

Another intriguing note in population density change within the eight neighbourhoods is that two mature suburban neighbourhoods decreased in population; Country Hills West, Kitchener, decrease from 2006 population panning district of 4180 from 2061, a differential of 2026 residents, possibly due to a maturing or exiting population. Westvale Meadows, Waterloo, decreased in population from 2001 at 6465 to 6425, possibly due to a maturity and exiting of older student population or neighbourhood development maximization. There is also a likelihood that both these suburban neighbourhoods require improved pedestrian planning in the area to

make walking attractive and inviting. This means trees, welcoming pathways, wider sidewalks with interesting neighbourhood focal points with close destinations. Given that Westvale Meadows, Waterloo is currently undergoing review of its urban design connectivity, may present a valid reasoning.

In terms of the existing research study neighbourhoods, which range in development age from 5 to 50+ years, healthy urban form already has an opportunity to address additional redesign depending on specific land use criteria. For example, an older neighbourhood like Mary Allen Uptown, Waterloo, initially built for pedestrians, and adjacent to significant new revitalization in the centre core, has redesigned its streets into one-ways and traffic calming to reduce auto speed and congestion. Development patterns can either then encourage walking and a pedestrian lifestyle or can encourage driving and traffic congestion (Kushner 2007). The Mary Allen Uptown neighbourhood largely benefits in transit and other areas from the intensification and closeness of amenities in the centre core.

Mid-aged suburban neighbourhoods, like Laurentian West, Kitchener, require more efficient public transit, and improved design of formal cycle paths and greenspace trails, all ongoing factors in any need to increase physical activity and suburban reduced automobile use. Incorporating additional greenspace into existing suburban areas would require rights of way on some private property, or rezoning current open spaces. In comparison to centre core neighbourhoods, the suburban neighbourhoods have larger variation in terms of scale, form and function. Any new development adjacent to these neighbourhoods will be subject to new local design guidelines, with a need to ensure these neighbourhoods have direct access to major amenity locations such as park spaces, areas of employment shopping, institutions and local public transit.

In terms of newer subdivision design, for example in Clair Hills, Waterloo, while its design presents challenges in convenient public transit given its significant distance from the centre city, the newer neighbourhood design incorporates new elements that encourage physical activity and neighbourhood engagement: greenspace trails and bicycle trails, narrow streets to reduce automobile congestion and promote walkability near the school areas.

The three centre core neighbourhoods, Central Park, Cambridge; Central and Civic Centre Frederick, Kitchener, and Mary Allen, Uptown Waterloo, which all experience recent revitalization, are implementing significant fundamental change in adaptive re-use and infill development projects, utilizing land use pattern as a promising tool to promote a pedestrian environment, and improved transportation linkages. Planners today recognize better integration of land use and densities, while conclude that automobile travel will decrease in a more intensified and grid like mixed land use.

Planning change will take time to implement and practiced within neighbourhood communities. It is important to recall that one hundred years ago there were no automobiles, cities and towns were designed for pedestrian and street cars. One hundred years from now we may envision the discovery of even different, healthier, friendlier and more accessible compact communities linked by rail and other public transport (Kushner 2007).

There is the recognition as well that planning change will require a cultural dimension in order to get people to embrace healthier lifestyle choice and change, to get out and become more physically active within their neighbourhood. This in itself requires a level of social marketing to provide not only incentives but dis-incentive packages in embracing the complexity of individual decision making, choice and practice, and enforcing changed behaviour. Culture changes slowly, and the healthy perspective results may be very different between the centre core neighbourhood areas than the suburban areas. It may be that the suburban areas will embrace health from a

‘recreational’ standpoint only, whereas the city core areas would embrace healthier activity from a ‘functional’ perspective.

The research findings recognize that community planning and aspects of the built environment have a significant impact on health. A built environment that incorporates reurbanized mixed use, and complete communities, transit oriented development with a focus on active transportation, can increase physical activity, improve air quality and enhance the development of social capital. Taken together, these improvements can help to reduce health disparities and create healthy communities.

#### **6.4 Reflections on the Research Experience**

With regard to the research, recommendation would be to carefully refine the research materials specific to your topic area. Volume research does not necessarily equate ‘better research’. Be cautious of ‘repetition’.

Make certain that the methodology is clearly defined. Interviews and questionnaire must allow for substantial preparation time for scheduling, with the anticipation that a certain degree of rescheduling or cancellations is inevitable. Have backup interview participants prepared should this occur.

As well, ensure that you have adequate reliable numbers of candidates to interview to provide a valid reflection of the data. If done differently, I would have increased the number of interview participants to provide a greater consideration of opinion, and to reduce any bias commentary or results.



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## APPENDICES

### Recruitment Consent Letter (University of Waterloo Purchased Letterhead/Envelopes)

#### 1. INFORMATION CONSENT LETTER FOR INTERVIEW STUDY

[Initial Recruitment via email]

2 Separate Letters: NEIGHBOURHOOD GROUP REPRESENTATIVES  
PLANNING EXPERTS



School of Planning

Faculty of

Environmental Studies N2L 2G1

University of Waterloo  
200 University Avenue West  
Waterloo, Ontario, Canada

519-888-4567  
Fax 519-725-2827

Dear (insert participants name);

#### **Re: Master's study Interview Invitation**

This letter invites you to participate in a study I am conducting as part of my Master's degree in the Department of Planning at the University of Waterloo under the supervision of Professor Pierre Filion. I will provide you with more information about this project and your involvement pending your decision to participate.

The purpose of the study is to examine how physical urban design, land use and transportation planning can affect and encourage healthy practices and healthy community outcomes. The research will expand knowledge on the relationships between urban design, land use, alternative transportation and health utilizing quantitative and qualitative methods.

I would like to include your organization as one of several organizations to be involved in my study. I believe that because you are actively involved in the; **[2 separate letters]**

- i. **[neighbourhood organizations]:** consideration of neighbourhood residential satisfaction, neighbourhood safety, effective physical design to encourage healthy living, and accessible public transit use, that,
- ii. **[expert planners]:** efficient design of urban neighbourhoods and policy to encourage alternative, effective and accessible public transit, and other alternative transportation uses to encourage less private vehicle use, increase the idea of walkable communities and public transit, that

you are therefore best suited to speak to regarding the various issues, such as promoting healthier communities through transportation alternatives.

Participation in this study is voluntary. It will involve a short interview of approximately 30 minutes in length to take place in a mutually agreed upon location. You may decline to answer



any of the interview questions if you so wish. You may decide to withdraw from the study at any time. With your permission, the interview will be tape-recorded to facilitate collection of information, and later transcribed for analysis. Shortly after the interview has been completed, I will send you a copy of the transcript to provide you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. All information you provide is considered completely confidential. Your name will not appear in any thesis or report resulting from this study, however comments will be noted from specific Neighbourhoods regarding specific neighbourhood variables. With your permission anonymous quotations may be used.

The data collected for the research will be securely stored in a locked file, with the retention period for final disposition of the data;

Paper Records

Confidential shredding after 2 year(s).

Audio/Video Recordings

Erasing of audio/video tapes after 2 year(s).

Electronic Data

Erasing of electronic data after 2 year(s).

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me at 519-581-1265 or by email at: [dmliptay@fes.uwaterloo.ca](mailto:dmliptay@fes.uwaterloo.ca). You can also contact my supervisor, Professor Pierre Filion at 519-888-4567 ext. 33963 or [pfilion@fes.uwaterloo.ca](mailto:pfilion@fes.uwaterloo.ca)

I would like to assure you that this study has been reviewed and has received ethics clearance through the Office of Research Ethics at the University of Waterloo. If you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes of this office at 519-888-4567 ext. 36005. *This letter will be presented to participants again at the time of the interview, where written consent will be obtained at that time.*

I anticipate that the results of my study will be of benefit to those organizations directly involved in the study, other policy or recreational organizations not directly involved in the study, as well as to the broader research community.

Yours truly,

Deirdre M. Liptay  
Masters Student Investigator  
School of Planning  
University of Waterloo

**Recruitment Consent Form** (University of Waterloo Purchased letterhead/Envelopes)



**School of Planning** University of Waterloo 519-888-4567  
200 University Avenue West Fax 519-725-2827  
**Faculty of** Waterloo, Ontario, Canada  
**Environmental Studies** N2L 2G1

**CONSENT FORM**

I have read the information presented in the information letter about a study being conducted by Deirdre Liptay of the Department of Planning at the University of Waterloo. I have had the opportunity to ask any questions related to this study and additional details requested.

I am aware that I have the option of allowing my interview to be tape recorded to ensure an accurate recording of my responses.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at 519-888-4567 ext. 36005.

With full knowledge of all foregoing, I agree, to participate in this study.

YES  NO

I agree to have my interview tape recorded.

YES  NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

YES  NO

Participant Name: \_\_\_\_\_ (Please print)

Participant Signature: \_\_\_\_\_

Witness Name: \_\_\_\_\_ (Please print)

Witness Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Recruitment Interview Questionnaire

### 3. INTERVIEW QUESTIONS TO PARTICIPANTS

[NEIGHBOURHOOD GROUP REPRESENTATIVES, PLANNING EXPERTS]

- **2 Questionnaire Outline: [30 minute interview]**

1. Neighbourhood Group representatives for 6 neighbourhood associations in study
2. Planning Experts, Region of Waterloo [public health, transportation, transit, community]

- 
1. **Neighbourhood Group representatives for 6 neighbourhood associations in study**  
[Focus: neighbourhood residential satisfaction, neighbourhood safety, effective physical design to encourage healthy living, and accessible public transit]

#### Questions:

1. **Confirm which neighbourhood community the association representative**

**Reside in:**

Shades Mill, Cambridge  
Central Park, Cambridge  
Country Hills West, Kitchener  
Central Frederick and Civic Centre, Kitchener  
Laurentian West, Kitchener  
Westvale Meadows, Waterloo  
Central and Uptown Waterloo  
Clair Hills, Waterloo

2. **Physical Activity Availability within study neighbourhood**

Q. does your neighbourhood design, provide a certain level of physical activity availability?

i.e. walking, bicycling, organized sports, exercise class, gardening, golfing, ice hockey or skating, jogging or running, swimming, soccer or basketball, or no physical activity.

Q. does your neighbourhood area or association encourage opportunity to use alternative forms of transportation; walking, bicycling, car pooling, public transit?

Q. what percentage of your neighbourhood population would you say participates in walking, bicycling, car pooling, public transit?

Q. where in the neighbourhood area, do residents ride their bicycle?

Q. are their trails or pathways, adequate sidewalks, roads or other that provide safe walking conditions in your neighbourhood?

Q. are amenities; school, bus stop, coffee shop, grocery store, community centre, other, close by for walking?

Q. what 3 things in your neighbourhood, enjoy physical walking or bicycling? Are there things in your neighbourhood that discourage physical activity?

### **3. Public Transit**

Q. does your neighbourhood area provide adequate hours and accessible public transit?

Q. what percentage of residents in your neighbourhood area make use of public transit?

Q. do residents in your neighbourhood use public transit primarily for work, school or recreation?

Q. are the bus stops within your neighbourhood adequately accessible in terms of walking distance?

Q. How long is the standard wait for public transit to arrive in your area? Is there adequate transfer to other bus facilities?

Q. What would improve the quality of public transit in your neighbourhood that would encourage more residents to drive less and use public transit.

Q. Does Rapid Bus transit affect your neighbourhood? How?

Q. Do you have an indication of how your neighbourhood residents would welcome light rail transit to the area? Do you have any particular neighbourhood concerns with light rail transit coming to your neighbourhood area?

### **4. Neighbourhood Design**

#### **Neighbourhood Cohesion.**

Q. Are the people in your neighbourhood friendly?

Q. Do the residents participate in organized activities?

#### **Aesthetics.**

Q. Are there trees along the streets in your neighbourhood?

Q. Are there interesting things to look at while walking/biking in your neighbourhood? Is there attractive landscaping?

Q. Are there attractive buildings, homes in your neighbourhood? What is the degree of density?

Q. Is your neighbourhood free from litter or vandalism?

## **5. Street Design**

Q. What type of road system dominates your neighbourhood; cul-de-sac or traditional grid system?

Q. Do personal automobiles dominate the neighbourhood street or driveways?

Q. Is there adequate public transit design or accessibility in your neighbourhood? If not, what could be changed?

## **6. Convenience**

Q. Are amenities in your neighbourhood within walking distance? i.e. grocery store, shops?

Q. Do your neighbourhood have walking or cycle paths?

Q. Is it easy to walk to the bus stop from most homes?

## **7. Safety**

Q. Does your neighbourhood offer a safe environment to encourage physical walking or physical activity, i.e. open parks, lighted pathways? Or is it fenced in?

Q. Do you consider your neighbourhood area to be safe? Is there vandalism or crime?

Q. Do residents walk alone after dark

Q. Are there other safety concerns you wish to talk about?

**We are finished the interview, thank you for your time.**

---

## **Questionnaire Outline #2.**

- 2. Planning Experts, Region of Waterloo [Transportation, Public Health Planners]**  
[Focus: urban neighbourhood design, road design, public transit; design, accessibility, resident acceptance and participation of rapid transit].

**Statement:** The study I am working on will expand knowledge on the relationship between urban design, land use, alternative transportation and health utilizing quantitative and qualitative methods.

The research will review a Region of Waterloo Public Health study undertaken in 2005 regarding Urban Form, Physical activity and Health, and expand further in a closer land use study and neighbourhood examination of the 6 neighbourhoods, 3 suburban, 3 city core urban, in an

examination of healthy community outcomes. Public transit was not included in this initial survey.

The research include interviews with 6 Region of Waterloo Neighbourhood Association representatives, as well as an intense land use analysis of the specific 6 neighbourhoods, in an examination of how physical urban design, land use and transportation planning can affect and encourage health practices and healthy community outcomes.

What I am hoping to obtain from you, as Planning experts, during this interview, is information on local urban design, specific to neighbourhood area design, and the effectiveness and implementation of public transit., rapid transit and residential acceptance of light rail transit initiatives.

Q. Do you feel that residents who reside in city core centres have healthier outcomes than residents who reside in suburban areas? Why?

Q. Do you feel that the private automobile has an impact on residential health? (i.e. poor air quality, less physical exercise, higher health risks to cardiovascular or respiratory disease, higher accident rate, higher mental health/longer commute/stress)

Q. Do you feel that the Region of Waterloo will be able to adequately meet increased population demand and community growth expected within the next 20 years?

Q. Do you feel that sustainable planning of communities and transportation alternatives is critical to health outcomes?

Q. Do you feel that urban areas can influence aspects of health and wellbeing, including air quality and neighbourhood design?

**Q. Neighbourhood Design...** Do you feel that structural areas like block size, street connectivity, population density, closeness of amenities, aesthetic and accessible neighbourhoods provide greater opportunity for physical activity like walking, biking or taking bus transit?

Q. What local policy or policies, if put into place, would reduce our reliance on fossil fuel use, and provide greater opportunity for individuals to make a choice about a healthier lifestyle? (rapid transit, bus transit, light rail transit, regional growth management strategy).

Q. Locally, within the Region of Waterloo, how can we market transportation alternatives such as increased neighbourhood walking, biking or public transit?

Q. Based on focus groups that have already taken place, to present rapid transit alternatives, how receptive do you feel residents are to rapid bus transit (now in place), and light rail transit (future).

Q. Do you feel that the bus transit service currently in place, is largely effective and accessible to all neighbourhoods within Waterloo region (or study areas)?

Q. What marketing tools could be used to increase acceptance of light rail transit, when Kitchener Waterloo has a higher percentage of persons driving private automobiles, over public transit?

Q. How can we market residents to accept alternative transportation uses; public transit, car pool, bicycling, walking, during high commute times? (embracing this sustainable transportation would reduce health risk disease form high air pollution levels).

Q. How can we get residents to embrace transportation alternatives as a personal choice and behavioral change?

**Statement: Discuss Air quality impact on local public health, with a link to environmental (auto) pollutants.**

Q. In terms of local vehicle emissions and exposure, how can we reduce private automobile source of air pollution along busy congested streets?

Q. Is it possible to reduce a suburban expansion (and lifestyle) which negatively affects land use and protection of the environment?

Q. As a region, are we able to meet the new Provincial Ontario Places to Grow Growth Plan, with specific focus on managing growth in reducing gridlock, urban sprawl and increased intensification? If not, what changes could be made? (funding?)

**Interview complete. Thank you for your time.**

**Statement: The research hopes to determine that with increased focus on intensification and transportation alternatives applied to neighbourhood, residents will live in more efficiently designed neighbourhoods, drive less, increase public transit use, be more physically active, and have improved health.**

**The (original) objectives of the research include:**

- To compare individual and community health of the suburban verses inner city urban neighbourhood
  - Determine alternative transportation methods and destinations within the neighbourhood
  - Determine urban design features and policy which facilitate alternative transportation utilization
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## Feedback/Thank you Letter to Participants

(University of Waterloo Purchased Letterhead/Envelopes)

<b>4. FEEDBACK LETTER TO PARTICIPANTS</b> [NEIGHBOURHOOD GROUP REPRESENTATIVES, PLANNING EXPERTS]
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### Department Letterhead

University of Waterloo  
Waterloo, ON  
N2L 3G1

Date

Dear [Insert Name of Participant]:

Thank you for your participation in this study. The purpose of this study is to examine how physical urban design, land use and transportation planning can affect and encourage healthy practices and healthy community outcomes.

The data collected during interviews will contribute to a better understanding of the relationships between urban design, land use, alternative transportation and community health.

Any data pertaining to you as an individual participant will be kept confidential. Once all the data are collected and analyzed for this project, I plan on sharing this information with the research community through seminars, conferences, presentations, and journal articles. If you are interested in receiving more information regarding the results of this study, or if you have any questions or concerns, please contact me at either the telephone number or email address listed at the bottom of the page. The study is expected to be completed by August 2008.

As with all University of Waterloo projects involving human participants, this project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. Should you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567 ext. 36005.

Yours truly,

Deirdre M. Liptay  
Masters Student Researcher

University of Waterloo  
School of Planning

519-581-1265  
dmliptay@fes.uwaterloo.ca