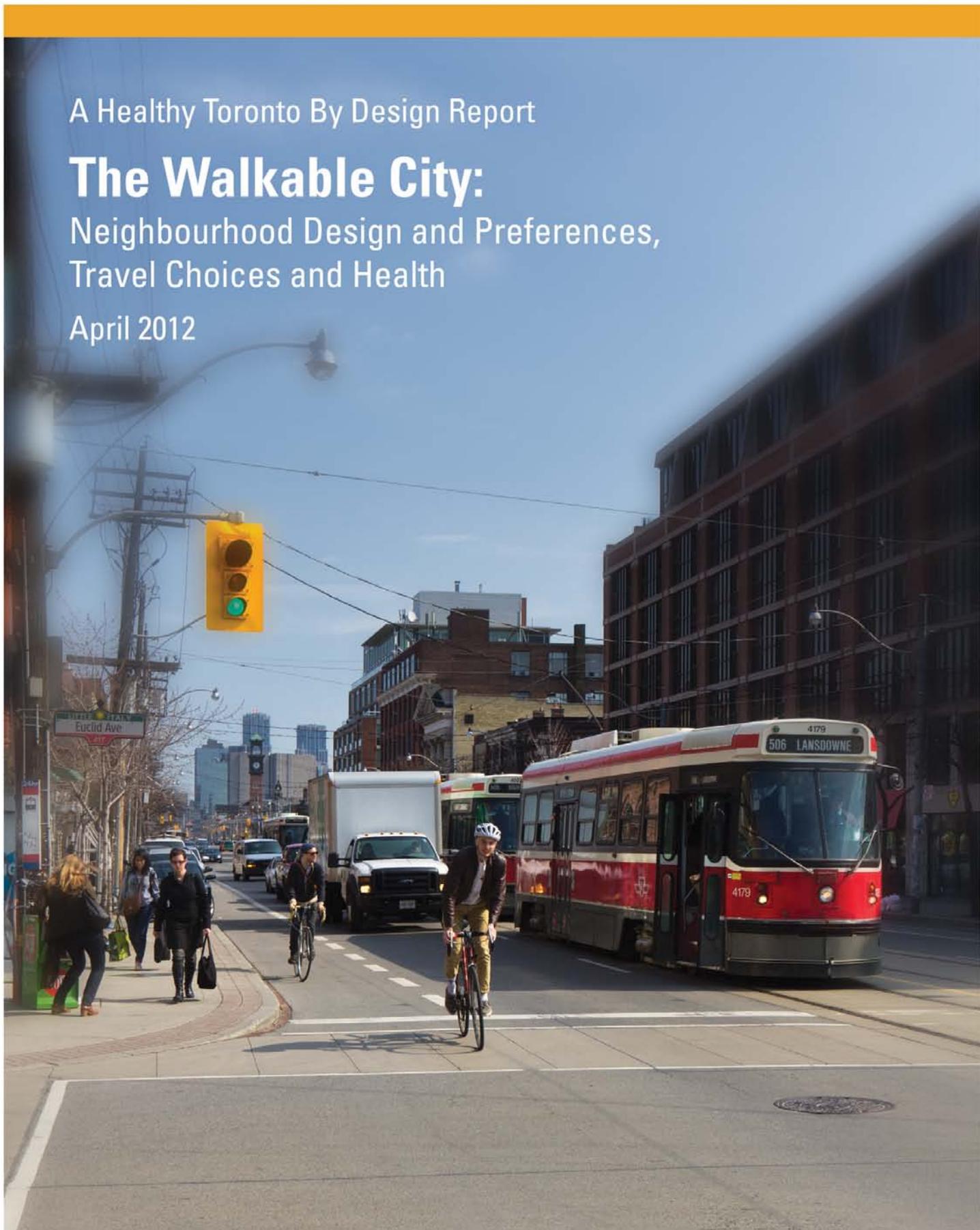


A Healthy Toronto By Design Report

The Walkable City:

Neighbourhood Design and Preferences,
Travel Choices and Health

April 2012



Reference:

Toronto Public Health. *The Walkable City: Neighbourhood Design and Preferences, Travel Choices and Health*. April 2012

Authors:

Kim Perrotta, Monica Campbell, Shawn Chirrey, Larry Frank and Jim Chapman

Acknowledgements: This report highlights some of the findings from the technical report, **City and Regional Residential Preference Survey Results for Toronto and Vancouver: A CLASP Final Report**, that was prepared by Dr. Larry Frank, Jim Chapman, Suzanne Kershaw and Sarah Kavage of Urban Design 4 Health, Ltd., for Toronto Public Health.

We would like to acknowledge the Canadian Partnership Against Cancer's Coalitions Linking Action and Science for Prevention (CLASP) Initiative and the Heart and Stroke Foundation for providing the funding needed for the research conducted by Urban Design 4 Health.

We would also like to thank the following people who have provided support, advice and assistance with the preparation of this summary report:

- Ned Sabev, Research Consultant, Healthy Public Policy, Public Health
- Dr. David McKeown, Medical Officer of Health, Public Health
- Phil Jackson, Director, Strategic Support, Public Health
- Marinella Arduini, Manager, Healthy Living, Public Health
- Janet Lo, Project Officer, Pedestrian Projects, Transportation Services
- Elyse Parker, Director, Public Realm, Transportation Services
- Fiona Chapman, Manager, Pedestrian Projects, Transportation Services
- Alice Miro, Heart and Stroke Foundation Canada
- Dr. David Mowat, Medical Officer of Health, Peel Public Health
- Gayle Burse, Director, Chronic Disease and Injury Prevention, Peel Public Health

Photos:

All photos in this report by Parent of worldneighbourhoods.com

Copies:

Copies of this summary report and the technical report can be downloaded at: <http://www.toronto.ca/health>

For Further Information:

Healthy Public Policy Directorate
Toronto Public Health
277 Victoria Street, 7th Floor Toronto
Ontario Canada M5B 1W2
416-392-6788

About the *Healthy Toronto By Design* Report Series

Healthy Toronto By Design was released by Toronto Public Health in October 2011 and was the first in a series of reports on how local communities shape the health of their residents. The report noted that healthy cities are cities that are liveable, prosperous and sustainable. They are cities with high quality built and natural environments, public transit, housing, culture, education, food and health care. Healthy cities don't just happen. They result from creative vision, strategic decision-making and thoughtful implementation that respects the needs and challenges of all residents. They happen by design – through intentional investment and provision of infrastructure, programs and services with health in mind.

This report is one of a series which explore what makes a healthy city. Visit Toronto Public Health's website at <http://www.toronto.ca/health> for a list of reports in the series. Some of the topic areas in the series include the following:

- **The Walkable City** – this report summarizes the findings of a Residential Preferences Survey that gauges public demand for walkable versus more auto-oriented neighbourhoods, and links this information with travel choices, physical activity levels and body weight.
- **Inventory of Best Practices** – this report showcases examples of innovative practices and policies across city government in Toronto that promote healthy built environments.
- **Active Transportation and Health** – this report synthesizes evidence on health benefits and risks associated with walking, cycling and physical activity related to the use of public transit, as well as economic assessments and specific strategies to increase the use and safety of active transportation in Toronto.
- **Enabling Healthier Neighbourhoods through Land Use Planning** – this report synthesizes zoning barriers and opportunities to promote healthy neighbourhoods, particularly in clusters of residential apartment towers in low income areas and inner suburbs of Toronto.
- **Health Impact Assessment Software Tool** – a software tool has been developed to assist policy and decision-makers understand how different approaches to neighbourhood design might impact health-related outcomes such as physical activity levels, body weight and greenhouse gas emissions. A technical report synthesizes information on the development of the tool and results of pilot testing.

Executive Summary

This report summarizes the findings of a residential preferences study that was directed at residents in the Greater Toronto Area (**GTA**) and the Greater Vancouver Regional District (**GVRD**). That study examined the preferences of residents towards walkable and transit-supportive neighbourhoods and specific features of those neighbourhoods. It also examined how the travel choices, levels of physical activity, and body weights of residents are related to the walkability of their current neighbourhoods and to their neighbourhood preferences. This report highlights the results for the GTA only, with a specific focus on the findings for the City of Toronto.

The study reveals an overwhelming preference for walkable and transit-supportive neighbourhoods across the GTA, with that preference being strongest in the City of Toronto. It demonstrated that there are specific neighbourhood features, such as having shops and services within walking distance of homes, and having a variety of small and medium sized food stores within walking distance of homes, that are strongly desired by Toronto residents. It also found that there is a strong latent demand for more walkable neighbourhood features among residents in the City who currently live in less walkable areas.

The study found that people living in walkable neighbourhoods across the GTA, and in Toronto, do more utilitarian walking, take transit more often, drive less often and less far, and have lower body weights, than those who live in less walkable neighbourhoods. These results suggest that people living in more walkable neighbourhoods in the GTA are more physically active with less chance of developing a chronic disease, than those who live in less walkable neighbourhoods. They also suggest that there may be significant air quality, climate change, and traffic reduction benefits associated with walkable and transit-supportive neighbourhoods.

The study also found that neighbourhood design, as well as neighbourhood preferences, is significantly associated with the travel choices selected by residents in the GTA. It demonstrated that the GTA residents surveyed who have a preference for walkable neighbourhoods walk more, use transit more frequently, drive less often, and driver fewer kilometres each week, than those who prefer less walkable neighbourhoods, particularly when they live in walkable neighbourhoods that support this preference. It also demonstrated that the GTA residents surveyed who live in walkable neighbourhoods walk more, use transit more frequently, drive less often, and drive fewer kilometres each week, particularly when they have a preference for walkable neighbourhoods.

Walkability mapping conducted for Toronto illustrates that, while the urban core of Toronto is highly walkable, many areas of the city are not. It also indicates that a number of the neighbourhoods in Toronto that are least walkable are home to low income residents who can experience increased rates of illness and injury. This is important because walkable neighbourhoods provide so many health and social benefits. They facilitate physical activity, social interaction, and access to jobs, services, and healthy foods.

While much of Toronto is built out, that does not mean that neighbourhoods cannot be changed over time. Old neighbourhoods, such as the West Don Lands, can be transformed from an industrial area into pedestrian-friendly and transit-supportive neighbourhoods. Apartment-oriented neighbourhoods can be revitalized with the introduction of shops and services that meet the needs of nearby residents. And suburban neighbourhoods can be made more walkable with the re-development of nearby avenues and the introduction of new shops, services and housing.

Collaboration by the public and private sectors will be required to revitalize those areas of the City that are currently least walkable. It will require a commitment to ensure that new neighbourhoods are developed to be walkable with nearby shops, services and parks where possible. It will also require working to introduce walkable neighbourhood features, such as food related stores, into less walkable established neighbourhoods when opportunities arise. Lastly, it will also require the support of residents living in existing neighbourhoods and awareness to help residents and decision makers to understand the benefits and features that help make neighbourhoods more walkable.

Table of Contents

	Page
Executive Summary	v
List of Figures & Tables	viii
Introduction	1
Healthy Cities.....	1
Physical Activity, Human Health & Neighbourhood Design	2
Healthy Body Weight & Neighbourhood Design.....	3
Air Quality, Human Health & Neighbourhood Design.....	4
Health Equity, Human Health & Neighbourhood Design	5
The Greater Toronto Area & City of Toronto	5
Walkability & the Walkability Index	6
Neighbourhood Features & Complete Communities.....	9
Study Design & Findings	10
Purpose.....	10
Survey Participants - Toronto & Outer GTA	10
Priority Factors when Selecting Neighbourhoods.....	11
Neighbourhood Features - Preferences & Trade-Offs - Toronto	12
Assessment of Current Neighbourhoods Features - Toronto	17
Latent Demand for Specific Neighbourhood Features - Toronto.....	17
Neighbourhood Design, Travel Choices & Body Weight - Toronto	18
Neighbourhood Design, Travel Choices & Body Weight - GTA	23
Neighbourhood Preference, Neighbourhood Design, Travel Choices & Body Weight - GTA	24
Travel Choice & Obesity - Toronto & the Outer GTA	27
Summary of Findings	29
Conclusions.....	30
Towards a More Walkable City	31
Neighbourhoods can be Changed	31
What can the Provincial and Federal Governments do?.....	34
What can the City do?	37
What can the Private Sector do?.....	40
What can Community Groups do?	42
What can Residents do?.....	43
References	45

List of Figures & Tables

	Page
Figure 1: Map of Greater Toronto Area	6
Figure 2: Utilitarian Walkability in Toronto	8
Figure 3: Distribution in Low Income Households	8
Figure 4: Areas of Low Walkability and Low Income	9
Table 1: Description – Survey Participants – City of Toronto & Outer GTA.....	11
Table 2: Priority Factors in Neighbourhood – Ranking	12
Table 3: Walkable vs. Auto-Oriented Neighbourhoods	13
Table 4: Closeness to Shops and Services	13
Table 5: Mixed Housing & Closeness to Shops	14
Table 6: Home Size & Travel Options.....	14
Table 7: Lot Size & Commuting Distance	15
Table 8: Street Design & Travel Options.....	15
Table 9: Public Recreation & Lot Size.....	16
Table 10: Access to and Size of Food Stores	16
Table 11: Assessment of Current Neighbourhood by Features - Percentage Considered Highly Walkable or Highly Auto-Oriented -Toronto & Outer GTA.	17
Table 12: Travel Choices & Body Mass Index (BMI) by Walkability of Current Neighbourhoods (Objective Assessment) - City of Toronto	19
Figure 5: Utilitarian Walking & Walkability – Toronto	20
Figure 6: Walking for Any Purpose & Walkability – Toronto.....	20
Figure 7: Transit Use & Walkability – Toronto	20
Figure 8: Body Mass Index (BMI) & Walkability – Toronto	21
Figure 9: Vehicle Travel & Walkability – Toronto	22
Figure 10: Vehicle Kilometres Travelled (VKT) & Walkability – Toronto	23
Table 13: Travel Choices & Body Mass Index (BMI) by Walkability of Current Neighbourhoods (Subjective Assessment) - Greater Toronto Area	23
Figure 11: Utilitarian Walking & Neighbourhood Preferences & Walkability of Current Neighbourhood – GTA.....	25
Figure 12: Transit & Neighbourhood Preferences & Walkability of Current Neighbourhood – GTA	25
Figure 13: Vehicle Kilometres Travelled (VKT) & Neighbourhood Preferences & Walkability of Current Neighbourhood – GTA	26
Table 14: Travel Choices & Body Mass Index (BMI) by the Neighbourhood Preferences & Current Neighbourhood Design – GTA.....	27
Table 15: Travel Choices & Obesity – Toronto & Outer GTA	27
Table 16: Commute to Work (% by Mode)	28
Table 17: Commute to School (% by Mode)	28

Introduction

Healthy Cities

Healthy cities are cities that are liveable, equitable and sustainable. They facilitate participation and prosperity for their residents by being inclusive, supportive and responsive to the diverse needs and expectations of their residents. Such cities provide the conditions and opportunities that foster healthy lifestyles and behaviour. Healthy cities provide urban environments in which the built and natural environments support health, mobility, recreation, safety, social interaction, and a sense of pride and cultural identity that is accessible to all their residents. Healthy cities don't just happen. They happen through intentional and thoughtful investment in community design, infrastructure, programs and services, with health in mind (TPH, 2011).

Health is strongly influenced by social, economic and environmental conditions – conditions heavily influenced by the design and function of our cities. The World Health Organization (WHO), the United States Centers for Disease Control and Prevention (CDC) and the Heart and Stroke Foundation of Canada (HSFC) are among many institutions that recognize that the way we plan, design and build our communities can influence our health (WHO, 2010; CDC, 2010; HSFC, 2011).

Walkable and transit-supportive neighbourhoods can play an important role in creating healthier cities. A growing body of evidence suggests that walkable and transit-supportive neighbourhoods are healthier and more environmentally sustainable than non-walkable neighbourhoods because they allow people to walk, bicycle and use transit more, and to drive less for their day to day trips. These travel choices are associated with higher levels of physical activity and lower body weights among residents. They can also be associated with lower emissions of air pollutants and greenhouse gases per person and potentially in reduced traffic congestion (CARB, 2005; WHO, 2011).

By offering a broader range of housing types and travel options, walkable neighbourhoods increase choice and equity by providing greater access to jobs, school, medical care, services, and cultural and social opportunities to all residents regardless of their age, income or abilities (WHO, 2011).

Walkability is affected by a number of other factors that are not addressed in this report including: streetscape issues such as shade, noise and trees; safety issues related to lighting, traffic, sidewalks and bike lanes; and recreational facilities such as parks, trails and greenspace. These issues are addressed in a companion piece, **Active transportation and health in Toronto**.



Physical Activity, Human Health & Neighbourhood Design

Physical Inactivity Poses a Significant Risk to Human Health

Physical inactivity poses a significant risk to human health in modern day Canadian society. It has been clearly linked to an increased risk in chronic diseases such as colon cancer, Type 2 diabetes, osteoporosis and heart disease (PHAC, 2003; HSFC, 2011). Estimates suggest that physical inactivity contributed to approximately 21,000 premature deaths in Canada in 1995 and cost Canadians about \$2.1 billion in health-related costs in 1999 (Katzmarzyk et al, 2000).

Despite the significant health benefits associated with physical activity, most Canadian adults and youth do not get the activity levels recommended by the Canadian Guidelines for Physical Activity. A recent study found that:

- 85% of Canadian adults do not get the 150 minutes per week of moderate to vigorous physical activity recommended; and
- 91% of boys (6 to 19 years in age) and 96% of girls do not get the 60 minutes per day of moderate to vigorous physical activity recommended (Colley, 2011a; Colley, 2011b).

Walking – The Most Common Source of Physical Activity

Walking is the number one activity used by most Canadians to stay physically fit. It is an activity that is generally easy for all age groups, inexpensive, and generally accessible to most people (Cameron, 2005). Several studies have found that time, or the lack of time, is one of the most common barriers to physical activity. For this reason, active transportation, where physical activity is substituted for a trip that might otherwise be made in a vehicle, is seen as a good way to encourage people to be more physically active because it allows them to accomplish two tasks in the same period of time (Lee & Moudon, 2004; HRHD, 2009).



Neighbourhood Design Linked to Levels of Physical Activity

A number of studies have demonstrated that neighbourhood design is associated with increased levels of physical activity among residents because of its impact on their travel choices. Neighbourhood features such as population density, employment density, land use mix, and street design have all been associated with the walking and cycling habits of residents. While these neighbourhood features do not appear to be related to recreational walking (i.e. walking for physical activity), they seem to be strongly related to utilitarian walking (i.e. walking directed at a purpose such as errands) (Saelens et al. 2003; Pulleyblank-Patrick et al., 2006). For example:

- In a Montreal study, women aged 45 and older living in neighbourhoods with a higher density of destinations, such as shops and services, were 53% more likely to walk at least 30 minutes per day, five days per week (Gauvin et al. 2008);
- In another study, conducted in the United States, when the number of different shops and services in a neighbourhood increased from three to four, the number of walking trips increased by 24% (Boer et al. 2007);
- One study found that urban sites with small blocks and extensive sidewalk systems had, on average, three times the volume of pedestrians as suburban sites with long blocks and short, incomplete sidewalk systems (Hess et al. 1999).

Public Transit Use Increases Physical Activity

Public transit is a neighbourhood feature, which is dependent upon neighbourhood design, which in turn affects the levels of physical activity among residents. A municipality's ability to offer convenient and affordable public transit service is dependent upon the population and/or employment densities in the neighbourhoods surrounding transit stops (Frank, 2000). If there are not enough people using transit from any particular stop, it will not be possible to provide convenient and affordable service.

Several studies suggest that public transit is a feature that affects the levels of physical activity of residents. For example, one study found that almost one third of transit users will spend 30 minutes or more each day walking to and from their transit stops (Besser & Dannenberg, 2005). This means that many adults could actually get the 150 minutes of physical activity recommended for good health by simply walking to and from their transit stops each week.

Healthy Body Weight & Neighbourhood Design

Unhealthy Weights are a Public Health Concern

In modern day society, unhealthy weights are becoming the norm, and are growing at an alarming rate. In 2005, Ontario's Chief Medical Officer of Health reported that almost one half of all adults living in Ontario were obese, while the number of obese children, ages seven to 13, tripled between 1981 and 1996 (Basrur, 2005). In Toronto, it has been estimated that four out of ten adults and one in five teenagers are overweight or obese (TPH, 2010).

Unhealthy weights can have a significant impact on human health and Canada's health care system. From 1985 to 2000, it is estimated that 57,000 deaths in Canada were associated with overweight and obesity (Katzmarzyk and Ardern, 2004).



The direct health care costs were estimated to be over \$1.8 billion in 1997 or 2.4% of total health care expenses in Canada that year. The three largest contributors were hypertension, Type 2 diabetes and coronary heart disease (Birmingham et al., 1999).

The escalating rates of obesity have been attributed to physical inactivity, poor nutrition, and the consumption of calorie dense but nutritionally poor foods which are often high in sodium, fat and/or refined carbohydrates (Raine, 2005; Drewnowski, 2003).

Neighbourhood Design Associated with Unhealthy Weights

Neighbourhood design has been associated with both the levels of physical activity among residents, as discussed above, and the consumption of nutrient poor, energy dense foods. Studies have demonstrated that people are more likely to eat healthy foods when they have ready access to grocery stores that sell healthy and affordable foods, such as fresh vegetables and fruit, than if they only have access to food from nearby convenience stores that offer mostly packaged and processed foods (Morland, 2002).

Access and availability to healthy foods has been found to have a greater impact on low income households that have less mobility and fewer transportation options. Several studies have demonstrated that the increased density of "fast-food" restaurants in lower-income neighbourhoods is a factor that contributes to increased rates of obesity in some American cities (Block et al., 2004; Maddock, 2004; Reidpath et al, 2002; RWPH, 2005).

Air Quality, Human Health & Neighbourhood Design

Poor air quality is a significant public health concern in Canada, particularly in southern Ontario. Air pollution has been clearly associated with increases in a broad range of acute health impacts and in chronic respiratory and cardiovascular diseases. The Canadian Medical Association has estimated that air pollution costs Canadians about \$8 billion per year in health-related costs (CMA, 2008). Toronto Public Health has estimated that air pollution contributes to 1,700 non-traumatic deaths and 6,000 hospital admissions each year in Toronto (TPH, 2004). More than one quarter of those health impacts have been attributed to traffic-related air pollution (TPH, 2009).

A number of studies have demonstrated that neighbourhood design and the provision of transit can have a substantial impact on emissions of air pollutants by influencing vehicle use, transit use and active modes of transportation (Frank & Chapman, 2004; Lawrence Frank & Company et al., 2005; Frank, 2006; Friedman et al., 2001).



For example, the California Air Resources Board (CARB) found that "complete" neighbourhoods built around public transit, with a variety of services within a five minute walk, reduced vehicle-related air emissions by up to 20% (CARB, 1997).

Health Equity, Human Health & Neighbourhood Design

Neighbourhood design can have a more profound impact on the health and well-being of people who live on low incomes because they are less likely to own their own vehicles and are therefore more dependent upon public transit, active modes of transportation, and local shops and services (Frank et al, 2003).

When neighbourhoods are walkable in their design and serviced with public transit, social and health inequities can be reduced because those who cannot afford one or more automobiles have greater access to jobs, health services, food stores and recreational facilities (WHO, 2011). This is also true for other populations that cannot drive because of age or ability such as teenagers, the elderly, and those who are differently-abled. In this way, walkable and transit-supportive neighbourhoods can improve the economic, physical and mental well-being of many populations within a community.

When walkable neighbourhoods include a mix of housing types, social and health inequities can be reduced because there is a larger pool of affordable housing in safe and well serviced neighbourhoods for people living on lower incomes. Mixed housing also allows people to age in place; to stay in the same neighbourhood during the different stages of their lives without being burdened by the costs and maintenance of housing that is beyond their needs (TPH, 2011).

There is also evidence that "walkable" neighbourhoods have lower levels of crime and a greater sense of social cohesion because there are "more eyes on the street" and a greater chance that people in the street will know each other (Kuo FE et al, 1998; Jackson LE, 2002).

The Greater Toronto Area & City of Toronto

This report examines the views that residents have about neighbourhood design and features that affect their walkability. It is based upon a residential preferences survey that was directed at residents across the Greater Toronto Area (GTA). This report summarizes the findings of that survey with a specific focus on the City of Toronto.

The GTA is an area of 7,124,000 square kilometres built around the north shore of Lake Ontario in southern Ontario. The City of Toronto, with a population of 2.6 million people in 2011 is at the centre of the

In a typical urban area, 10 to 20% of trips are made by non-motorized modes yet only 2-5% of total government transportation budgets are devoted to non-motorized facilities (Victoria Transport Policy Institute, 2011).

GTA with four regional municipalities built around it: Halton Region with a population of 0.5 million is on the western border of the GTA; Peel Region with a population of 1.3 million is west and north of the City of Toronto; York Region with a population of 1.0 million is north of the City of Toronto; and Durham Region with a population of 0.6 million is east of the City (see Figure 1) (Stats Can, 2012).

The four regional municipalities surrounding the City of Toronto, which will be referred to as the **outer GTA** throughout this report, are much less densely populated than the inner core of Toronto. Toronto has an average population density of 4,150 people per square kilometre while the four regional municipalities in the outer GTA have population densities ranging from 241 people per square kilometre in Durham Region to 1,040 people per square kilometre in Peel Region (Stats Can, 2012).

Figure 1: Map of Greater Toronto Area



Walkability & the Walkability Index

Throughout this report, neighbourhoods are discussed in terms of their "walkability". The walkability of neighbourhoods has been measured using a **Walkability Index**. The Walkability Index is a rigorous tool that has been developed to measure and evaluate neighbourhood design features that have been clearly associated with utilitarian walking such as residential density, retail ratio, land use mix, and intersection density (Frank et al., 2009).

The walkability index was not designed to address: streetscape issues or features such as shade, noise and trees; safety issues related to lighting, traffic, sidewalks and bike lanes; or recreational facilities such as parks, trails and greenspace, which also have a significant impact on the walking and cycling behaviour of residents (HRHD, 2009).

The Walkability Index is a continuous measure that reflects several neighbourhood characteristics:

- **Residential Density** which indicates how many people live on a hectare of land;
- **Retail Ratio** which indicates how much land in the neighbourhood is dedicated to shops and commercial buildings, versus parking;
- **Land Use Mix** which indicates how varied the land uses are within a neighbourhood (e.g. are there, stores, libraries, recreation centres, and offices in a neighbourhood?); and
- **Intersection Density** which indicates if roads are built on a connected grid with short blocks or if they are built with long blocks or cul-de-sacs.

Using a Geographical Information System (**GIS**), a Walkability Map was developed for the City of Toronto which illustrates the walkability of neighbourhoods across the city as low, medium-low, medium-high, or high. As can be seen in **Figure 2**, while the downtown core of the City is highly walkable, there are many areas of the City that have been rated low for walkability.

There are a number of areas in the City that are rated low for walkability that overlap (**Figure 4**) with neighbourhoods that have a high percentage of people living on low incomes as defined by Statistics Canada (**Figure 3**) (i.e. low income before tax cut-off relates to income levels at which families, or persons not in economic families, spend 70% or more of their before tax income on food, shelter and clothing). These neighbourhoods should be given priority for improvement because of the negative impact that poor walkability can have on the health and well-being of low income populations.

Figure 2: Utilitarian Walkability in Toronto

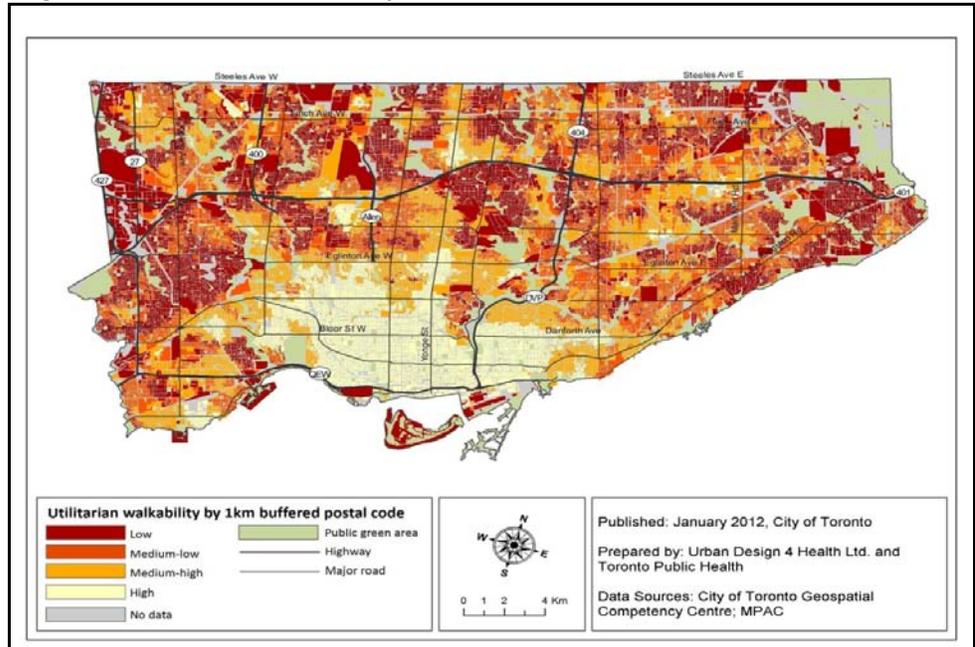


Figure 3: Distribution in Low Income Households

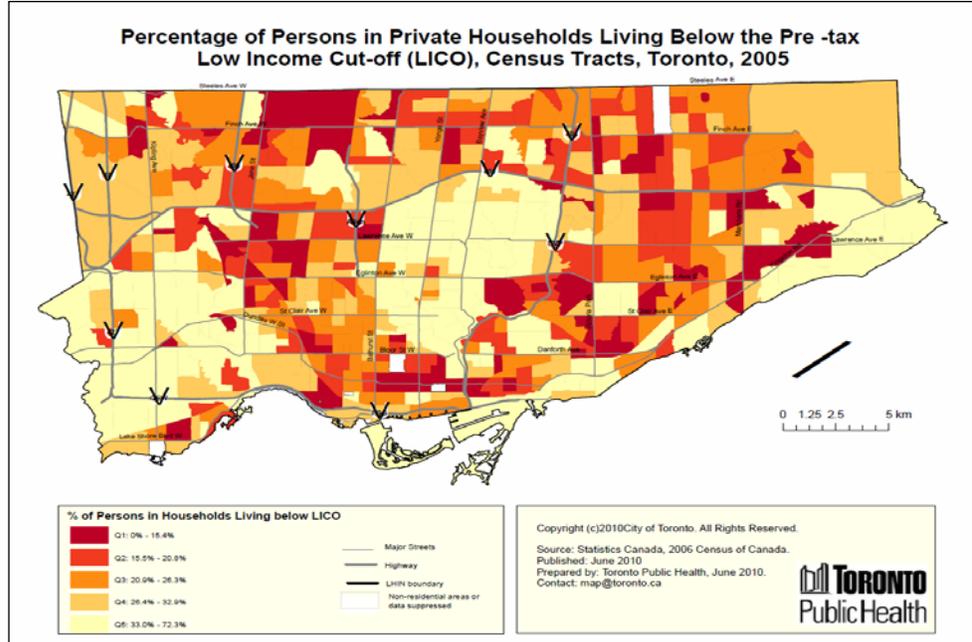
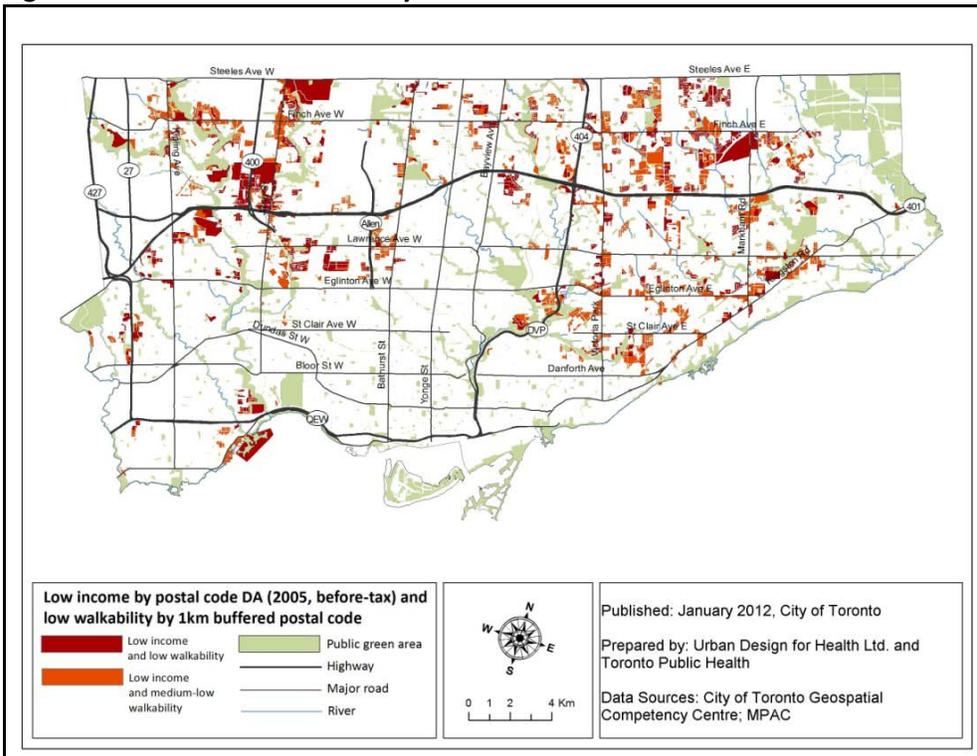


Figure 4: Areas of Low Walkability and Low Income



Neighbourhood Features & Complete Communities

Within the land use planning field, the term **complete communities** is used to refer to communities that include all of the different elements that are needed for residents to live a full life. Complete communities have jobs, schools, stores, health services, community services, housing for all the different stages of life, housing that is affordable for all of the people who live and work in the community, parks, recreational facilities, and transportation infrastructure and services to meet the needs of residents.

The residential preferences survey discussed in this report touches on many features of a complete community, such as access to jobs, schools, public transit, greenspace, food-related and other commercial retail. Throughout this report, we refer to the various characteristics of a neighbourhood, some of which speak to the walkability of the neighbourhood and some of which speak to the completeness of the community, as **neighbourhood features**.

Study Design & Findings

Purpose

This report presents the results of a residential preferences survey that was directed at residents in the GTA which included questions about neighbourhood design, neighbourhood features, modes of transportation, and Body Mass Index (BMI).

The survey examined:

- The type of neighbourhood that residents in Toronto and the outer GTA prefer;
- The specific neighbourhood features that are important to residents and which features they are willing to trade-off for others;
- The specific neighbourhood features that residents feel are missing from their current neighbourhoods;
- How neighbourhood design is related to travel choices, levels of physical activity, and body weight; and
- How neighbourhood design and neighbourhood preferences are related to the travel choice, levels of physical activity, and body weight.

Survey Participants - Toronto & Outer GTA

A total of 1,525 surveys were completed in the GTA with three quarters completed by residents in the City of Toronto and one quarter by residents in the outer GTA. Survey participants were recruited across different income levels and from neighbourhoods with different levels of walkability.

The people who participated in the survey were found to be a good match for the population in the GTA in terms of income, marital status, employment variables, and average household size. However, the survey population included 5.3% fewer men, 11.4% more university educated people, and 11.4% fewer immigrants than the population of the GTA. This means that the results of the survey may slightly under-represent men and immigrants while slightly over-representing university educated residents.

While the residents surveyed from the outer GTA were similar to those from Toronto in age, household size, and years living in Canada, there were some notable differences between the two groups. A greater percentage of the residents surveyed from the outer GTA were married, living in single detached dwellings, and owned their own homes, compared with the Toronto residents.

In addition, a smaller percentage of residents from the outer GTA had university degrees than Toronto participants. Lastly, on average, the

residents surveyed from the outer GTA had higher incomes than the Toronto residents surveyed (see **Table 1**). More details about the survey methodology can be found in the technical report.

Table 1: Description - Survey Participants - City of Toronto & Outer GTA		
Variable	Toronto	Outer GTA
Numbers Surveyed	1,133	392
Average Age	50	50
% Male	41	50
% Married	43	63
Average Household Size	2.3	2.7
% Single Detached Dwelling	31	59
% Owning Home	53	80
Income Category	\$40-60,000	\$60-80,000
% University Degree	47	39
% Employed	64	68
Years in Canada	42	45

Priority Factors when Selecting Neighbourhoods

Residents in Toronto and the outer GTA were asked to rate the importance of factors when selecting their current neighbourhoods using a scale of 1 (not important at all) to 4 (very important). These 21 factors have been ranked according to their average score in **Table 2**.

The findings indicate that residents in the GTA place a high value on neighbourhoods that are walkable and transit-supportive. While survey participants from both Toronto and the outer GTA ranked affordability as the most important factor considered when deciding upon their current neighbourhoods, they also identified ease of walking, easy access to work by transit, closeness to shops and services, and closeness to a wide range of small and medium sized food stores, among their top ranked factors. Closeness to bus stops and train stations were also among the top five factors for Toronto survey participants (see **Table 2**).

Table 2: Priority Factors When Selecting a Neighbourhood (Ranked)		
Features	Toronto	Outer GTA
Affordability	1	1
Ease of walking	2	3
Easy access to work & other destinations by transit	3	5
Closeness to shops & services	4	4
Closeness to bus stops & trains	5	8
Closeness to wide range of small to medium size food stores	5	4
Size inside home	5	2
Closeness to open space	6	3
Closeness to job or school	7	4
Closeness to recreational space (e.g. swimming, sports, playgrounds, jogging)	8	5
Noise from traffic	8	3
Closeness to restaurants	9	8
Closeness to family and friends	9	5
Access to highways	9	4
Closeness to cultural/entertainment venues	10	9
Ease of bicycling	11	8
Quality of Schools	11	6
Size of the yard	12	4
Closeness to elementary school/child care	13	7
Closeness to cultural/ethnic community	14	10

Neighbourhood Features - Preferences & Trade-Offs - Toronto

Central to the survey were eight questions about "trade-offs" between different neighbourhood features with one walkable and one auto-oriented option for each. Questions were designed so that respondents had to make a choice about what they preferred most and reflected real world trade-offs. For each question, except one, illustrations were provided to help people visualize the different types of neighbourhood features.

The survey participants' preferences were assessed based on an 11-point Likert scale. Preferences were considered "strong" when responses were at the extreme ends of the scale (i.e. 0 - 2 or 8 - 10). Those who did not have strong feelings about one of the two options presented (i.e. those who rated the options with a 3-7) are not reflected in the tables below. Consequently, the percentages in the tables do not add up to 100.

1. Walkable vs. Auto-Oriented Neighbourhood

There is very strong support for walkable and transit-oriented neighbourhoods across the GTA with that support strongest in the City of Toronto. When asked to choose between a walkable neighbourhood and an auto-oriented neighbourhood as described in Table 3, three quarters of Toronto residents surveyed expressed a strong preference for the walkable neighbourhood, while only 6% expressed a strong preference for an auto-oriented neighbourhood (see Table 3).

Table 3: Walkable vs. Auto-Oriented Neighbourhoods			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	A mix of housing types, a range of shops and services within walking distance, a short commute to work or school, transit stops within walking distance.	74	46
Auto-oriented	Single-family homes only, a range of shops and services within a few kilometres, a long commute to work or school, bus and train stops within driving distance.	6	21

2. Closeness to Shops and Services

Residents across the GTA place a high value on neighbourhoods that allow them to walk to shops and services. Almost two thirds of Toronto residents and one third of the outer GTA residents surveyed expressed a strong preference to live in a neighbourhood with stores and services within walking distance (i.e. 10 minute walk). Only 8% of Toronto residents surveyed expressed a strong preference to live in neighbourhoods where homes are separated from shops and services (see Table 4).

Table 4: Closeness to Shops and Services			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	With stores, libraries and restaurants within a 10 minute walk.	61	31
Auto-oriented	Where stores are kept separate from the houses, even if it means I cannot walk to stores, libraries or restaurants.	8	26

3. Mixed Housing & Closeness to Shops and Services

Toronto residents appear to be quite willing to accept a mix of housing types if it provides walkable access to shops and services. Almost one half of Toronto residents surveyed expressed a strong preference to live in neighbourhoods that have a mix of housing and smaller yards if it means they have a variety of shops and services nearby. Relatively few (15%) expressed a preference for a neighbourhood that separates houses from shops and services (see Table 5).

Table 5: Mixed Housing & Closeness to Shops			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	Mixed housing types, small lots, and less private backyards with lot of services and activities nearby.	48	18
Auto-oriented	Single family houses, farther apart, on lots 10 metres wide or more, with private backyard space, even if it means there are no nearby shops or services.	15	44

4. Home Size & Travel Options

Toronto residents are quite willing to trade-off home size and interior space if it means they can walk, cycle or take transit to nearby commercial areas. More than half of Toronto residents surveyed expressed a strong preference for neighbourhoods with smaller homes in close proximity to commercial areas, while only 7% expressed a strong preference to live in a neighbourhood with larger homes and distant commercial areas (see Table 6).

Table 6: Home Size & Travel Options			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	With smaller homes with less interior living space where people can walk, cycle, or take public transit for trips because commercial areas are nearby (i.e. 10 minute walk).	53	25
Auto-oriented	With larger homes with more interior living space, where commercial areas are driving distance from homes (i.e. 45 minute walk)	7	24

5. Lot Size & Commuting Distance

Toronto residents are willing to accept smaller lots to live within close proximity of their jobs, school and other important destinations. Almost one half of the Toronto residents surveyed expressed a strong preference for neighbourhoods with smaller lots that are close to work or schools, while relatively few (11%) expressed a strong preference to live in neighbourhoods with larger lots that are distant from work or school (see **Table 7**).

Table 7: Lot Size & Commuting Distance			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	Within 5 km of work, school and other important destinations with houses close together and smaller lots.	47	21
Auto-oriented	Houses farther apart on larger lots which and commuting more than 25 km to work, school or other important destinations.	11	34

6. Street Design & Travel Options

Toronto residents want streets designed to support walking, cycling and transit. More than half of the Toronto residents surveyed expressed a strong preference for street designs that allow them to walk, cycle or take transit even if means that there will be greater foot and car traffic on their streets. Relatively few (12%) expressed a strong preferences for streets designed to discourage foot and car traffic (see **Table 8**).

Table 8: Street Design & Travel Options			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	Neighbourhood which allows people to walk, cycle or take public transit for some of the trips even if it has streets with people and cars from other neighbourhood travelling through it.	53	23
Auto-oriented	Neighbourhood with cul-de-sacs and few people from other neighbourhoods walking or driving through it even if it requires driving for all trips.	12	29

7. Public Recreation & Lot Size

Easy access to public recreation is very important to Toronto residents. Almost one half of Toronto residents surveyed indicated a strong preference to have public recreation opportunities within walking distance even if it means they have smaller lots and less private yards. Only 12% expressed a strong preference for larger lots if it meant less access to public recreation (see Table 9).

Table 9: Public Recreation & Lot Size			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	Within a short walk, there is lots of public recreation and green space for swimming, walking, jogging, running trails, social interaction, sports, and playground, but there is little space for recreation on private property.	45	30
Auto-oriented	There is lots of space on private property for recreational activities, but little public recreation and green space for swimming, jogging, running, sports, and social interaction within walking distance.	12	25

8. Access to and Size of Food Stores

Residents across the GTA feel strongly about having easy access to small and medium sized food stores. More than one half of Toronto residents surveyed and almost one third of residents in the outer GTA expressed a strong preference for neighbourhoods that have a broad range of small and medium-sized food stores within walking distance. Few Toronto residents (11%) expressed a strong preference for neighbourhoods with supermarkets that are not within walking distance (see Table 10).

Table 10: Access to and Size of Food Stores			
Options	Description	Strong Preference (%)	
		Toronto	Outer GTA
Walkable	Where people can easily walk to a wide range of small and medium sized grocery stores, fruit and vegetable stands, butchers, baker and speciality food stores.	54	30
Auto-oriented	With few food stores within walking distance but several very large supermarkets within a 10 minute drive.	11	22

Assessment of Current Neighbourhoods Features - Toronto

When asked to assess the overall walkability of their current neighbourhoods, two thirds of Toronto residents surveyed felt that their neighbourhoods were highly walkable, while only 8% felt that their neighbourhoods were highly auto-oriented.

When asked to assess the walkability of their neighbourhoods for the seven specific neighbourhood features, the percentage of Toronto residents who found each of the seven features in their current neighbourhoods to be highly walkable ranged from a low of 41% for access to small and medium sized food stores to a high of 60% for street design and travel options (see **Table 11**). Those who did not feel that their neighbourhoods were highly walkable or highly auto-oriented are not included in the table below so the numbers do not add up to 100.

Table 11: Assessment of Current Neighbourhood by Features – Percentage Considered Highly Walkable or Highly Auto-Oriented – Toronto & Outer GTA					
Neighbourhood Feature		City of Toronto		Outer GTA	
		Walkable	Auto	Walkable	Auto
1.	Walkable vs. Auto-Oriented	62	8	32	24
2.	Shops & Services	59	10	24	30
3.	Housing Mix, Shops & Services	52	10	20	36
4.	Housing Size & Travel Options	54	5	22	18
5.	Lot Size & Commuting Distance	52	6	24	26
6.	Street Design & Travel Options	60	8	28	20
7.	Lot Size & Public Recreation	47	8	25	16
8.	Access to & Size of Food Stores	41	13	11	36

Note: Only participant responses indicating their neighbourhood is highly walkable or highly auto-oriented are accounted for in this table, so the numbers do not add up to 100.

Latent Demand for Walkable Neighbourhood Features - Toronto

While there is very strong support for walkable neighbourhoods within the City of Toronto, there are many areas that are not walkable in their design as indicated by objective measures used to develop the Toronto Walkability Map in **Figure 2**. The residential preferences study found a strong latent demand among Toronto residents for walkable neighbourhood features that are missing from their current neighbourhoods.

To identify this latent demand, the preferences expressed by the residents surveyed for the seven specific neighbourhood features were compared against their current neighbourhoods which were assessed with objective measures of walkability. This comparison identified the



percentage of residents who are living in more auto-oriented neighbourhoods (with low to medium low walkability) who would instead prefer one or more neighbourhood features typical of a more walkable neighbourhood.

Among Toronto residents surveyed who live in auto-oriented neighbourhoods, the study found that:

- 32% want to live in a more mixed use neighbourhood that has a variety of shops and services within walking distance;
- 21% want to live in a neighbourhood with mixed housing types if it means they could walk, cycle and use transit to get to commercial areas, even if it means lots are smaller;
- 21% would be willing to live in smaller homes if it means they could walk, cycle or commute to commercial areas;
- 25% would be willing to live in a neighbourhood with smaller lots if it means they could live close to work or school;
- 25% want to live in neighbourhoods with connected streets (as opposed to cul-de-sacs) that shorten travel time and support walking, cycling and public transit, even if it means people and cars from other neighbourhoods travel will through them;
- 21% want to live in neighbourhoods that have public recreation within walking distance even it means they would have smaller private yards; and
- 24% want to live in a neighbourhood where they can easily walk to a variety of small and medium sized food stores rather than have to drive to a supermarket, even though it may be larger.
- This is valuable information because it identifies a demand for walkable neighbourhood features that is currently not being met. It identifies the qualities that Toronto residents would like to see in new and re-developed neighbourhoods in the City.

Toronto residents surveyed from the least walkable neighbourhoods in the City, drive their cars four times as often and six times as far, as residents in the most walkable neighbourhoods. They also walk for utilitarian reasons 2.7 less often and use transit 2.5 times less often.

Neighbourhood Design, Travel Choices & Body Weight - Toronto

This section explores the links between neighbourhood design, travel choices, levels of physical activity and body weight.

Toronto residents who participated in the survey were sorted into four categories based on the walkability of their current neighbourhoods using the objective data applied in the Walkability Map. Relationships were then examined between the walkability of the participants' neighbourhoods and their travel choices and Body Mass Index (**BMI**).

BMI is calculated from self-reported weight and height (kg/m^2) and is used to classify adults as: normal weight (18.5-24.9), overweight (25-29.9), and obese (30+). The BMI is the most recognized indicator of obesity and is widely accepted by the World Health Organization and Health Canada and recommended in clinical practice by the Canadian Medical Association (CMA). The BMI has some limitations as it is a crude indicator of body composition (i.e., it does not clearly address issues related to fat and muscle distribution). Overall however, it is considered a good indicator for obesity and health risk when comparing populations (CIHI, 2004, CMA, 2007; Health Canada, 2003).

For the City of Toronto, a significant relationship was found between the walkability of residents' neighbourhoods, and walking for utilitarian reasons, walking for any reason, transit use, vehicle use, and vehicle kilometres travelled (VKT) (see Table 12).

Table 12: Travel Choices & Body Mass Index (BMI) by Walkability of Current Neighbourhoods (Objective Assessment) – City of Toronto						
Walkability	Walking-Utilitarian (Days/wk)	Walking – Any Reason (Days/wk)	Transit Use (Days/wk)	Vehicle Use (Days/wk)	VKT Per week	BMI
Low	2.0	3.8	1.4	4.6	278	26.8
Medium Low	3.4 *	4.8*	2.4 *	3.5 *	192 *	25.9
Medium High	4.8 *	5.7*	2.4*	1.9 *	122 *	25.7
High	5.4 *	5.3*	3.5*	1.1*	45^	25.7
* A statistically significant difference from the reference category (low walkability) ^ The high walkability quartile (#4) has a low number of participants (n=23). Despite this smaller than desirable number, the results are provided.						

As illustrated by **Figures 5, 6 and 7**, there is a direct relationship between the walkability of residents' neighbourhoods and the frequency with which they walk for utilitarian reasons, walk for any reason, and use public transit. The more walkable their neighbourhoods are, the more often they walk and use public transit. In fact, the study found that residents surveyed from the most walkable neighbourhoods in Toronto, walk for utilitarian reasons 2.7 times as often, and use transit 2.5 times as often, as residents in the least walkable neighbourhoods.

Figure 5: Utilitarian Walking & Walkability – Toronto

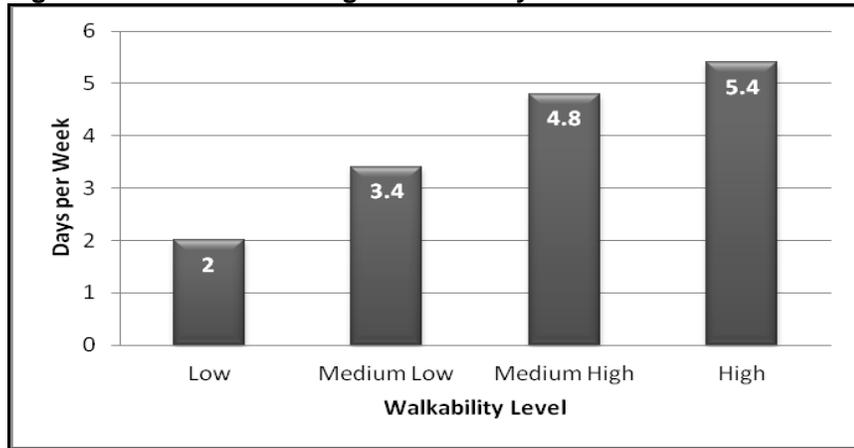


Figure 6: Walking for Any Purpose & Walkability – Toronto

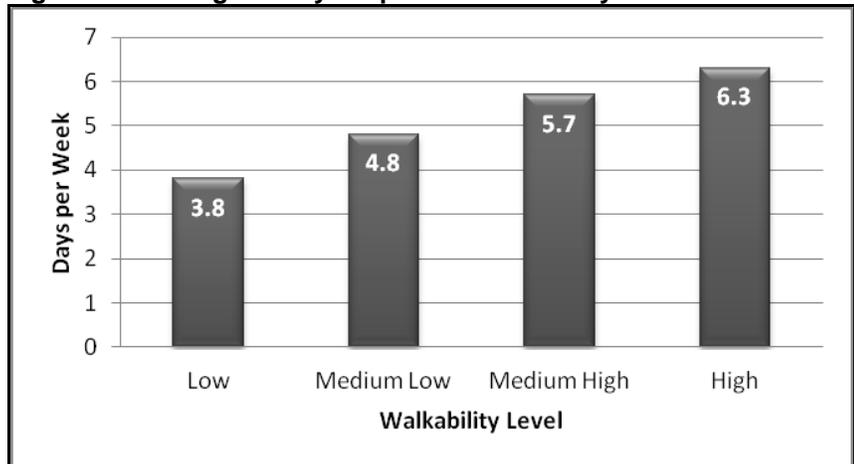
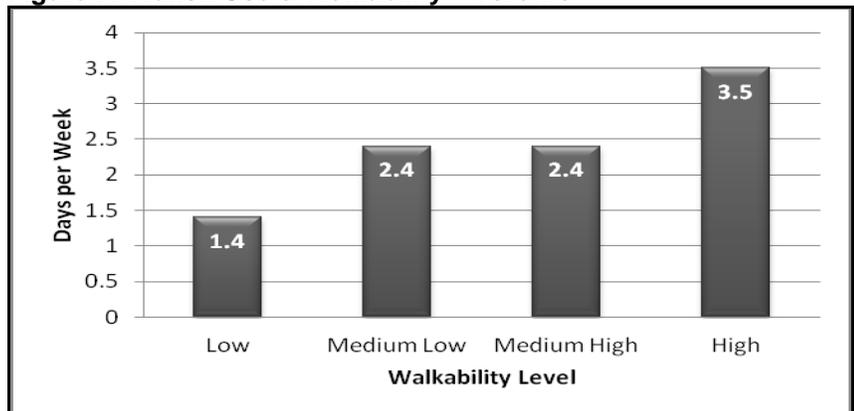


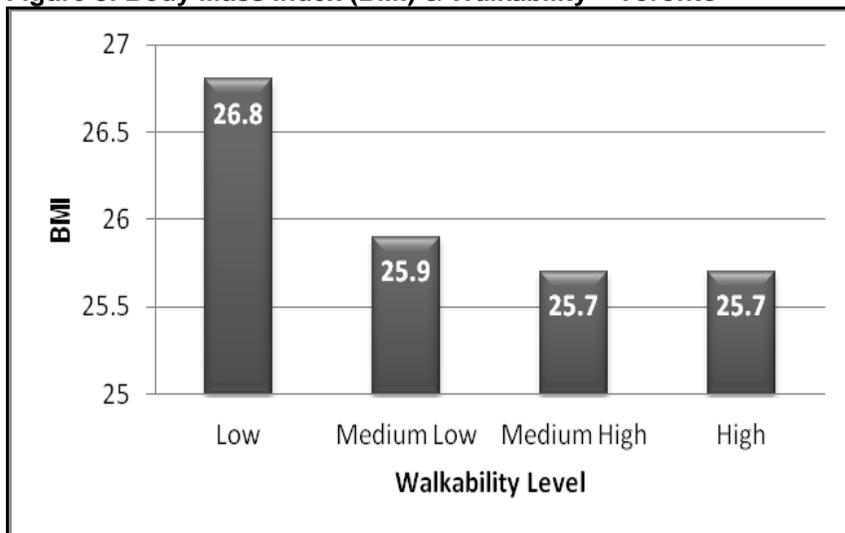
Figure 7: Transit Use & Walkability – Toronto



As illustrated in **Figure 8**, the BMI also appears to decrease as the walkability of the neighbourhoods increase. The study found that residents surveyed from the most walkable neighbourhoods in Toronto have, on average, a BMI that is one point less than that of residents from the least walkable neighbourhoods.

When the BMI is hovering around 27, a one point decrease can be associated with a 6 or 7 pound decrease in weight. While this weight change could be considered substantial for an individual, it is much more meaningful when it is the average weight change for a large population because it suggests that there could be many more people in the population who are no longer in the obese range of weight where the risks of chronic diseases such as Type II diabetes are very high (Chapman, J., 2012).

Figure 8: Body Mass Index (BMI) & Walkability – Toronto



The study also found an inverse relationship between the walkability of neighbourhoods in Toronto and vehicle use. As neighbourhoods become more walkable, residents drive their cars less often and drive fewer kilometres each week (**Figures 9 and 10**). In fact, residents surveyed from the least walkable neighbourhoods within the City, use their cars more than four times as often, and drive six times as far, as residents in the most walkable neighbourhoods.

These findings are consistent with those found in other studies directed at the walkability of neighbourhoods and add evidence to a growing body of literature which suggest that walkable neighbourhoods can provide health benefits by increasing the levels of physical activity among residents and reducing vehicle-related emissions that contribute

Residents surveyed from the most walkable neighbourhoods in the entire GTA, walk for utilitarian reasons three times as often, use their vehicles half as much, and drive them half as far each week, as residents in the least walkable neighbourhoods.

to poor air quality and climate change (WHO, 2011; Frank L et al., 2006; Saelens, Sallis, & Frank, 2003; Frank & Chapman, 2004; CARB 1997). For Toronto residents, there does not appear to be a relationship between the walkability of their neighbourhoods and their recreational walking or bicycle riding. Residents from highly walkable neighbourhoods do not walk for recreation, or ride their bicycles, significantly more or less often than people living in less walkable neighbourhoods. These activities are likely affected more by other factors beyond this study such as access to, and the safety and quality of bike lanes, trails, parks and open space.

Figure 9: Vehicle Travel & Walkability Toronto

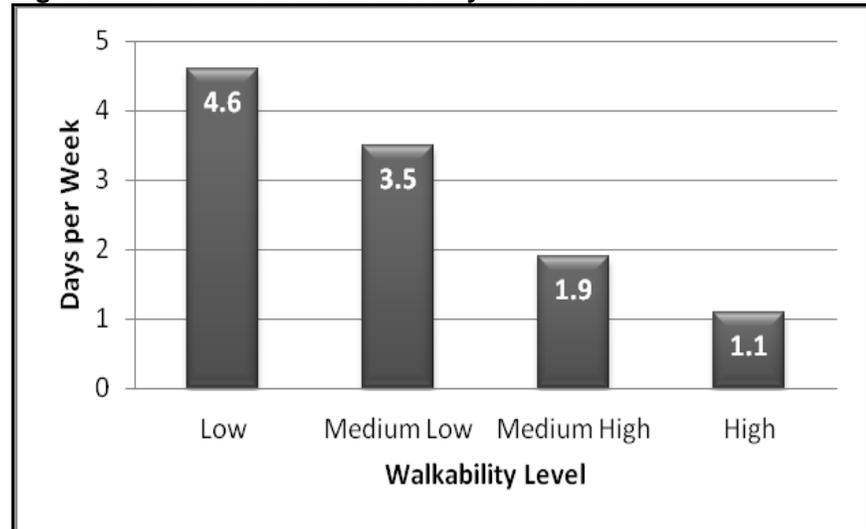
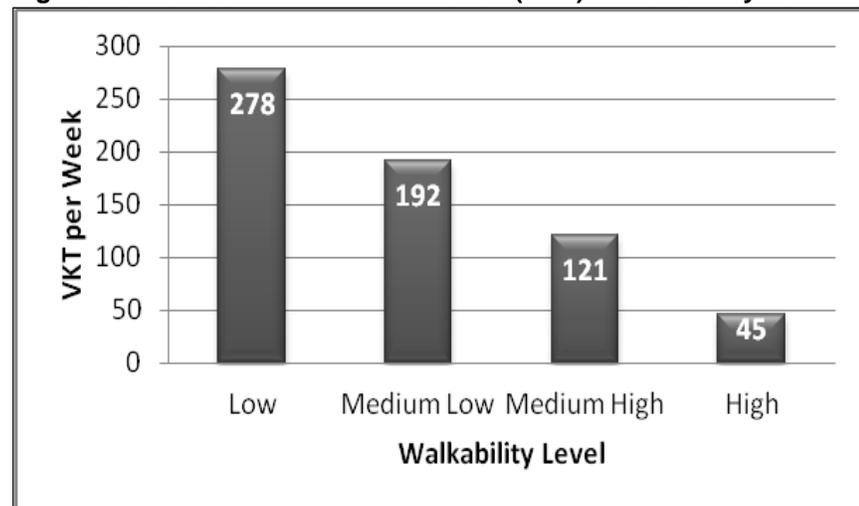


Figure 10: Vehicle Kilometres Travelled (VKT) & Walkability Toronto



Neighbourhood Design, Travel Choices & Body Weight – Greater Toronto Area

The study also examined the relationship between the walkability of the neighbourhoods across the GTA with the travel choices and BMI of the residents surveyed. In this case, the walkability of neighbourhoods was based on the assessment of the survey participants, not on objective data because the Walkability Index has not been applied to the entire GTA as it has for the City of Toronto.

The study found, once again, a statistically significant relationship between the walkability of neighbourhoods and walking for utilitarian reasons, walking for any reason, transit use and vehicle use. As the walkability of the neighbourhoods increased, utilitarian walking, walking for any purpose and transit use increased, while vehicle use and distance travelled decreased. The BMI also decreased (**see Table 13**).

In fact, the survey demonstrated that the residents surveyed from the most walkable neighbourhoods in the entire GTA, walk for utilitarian reasons 2.7 times as often each week as residents in the least walkable neighbourhoods. They also use their vehicles half as much and drive them half as far (**see Table 13**).

Table 13: Travel Choices & Body Mass Index (BMI) by Walkability of Current Neighbourhoods (Subjective Assessment) – Greater Toronto Area						
Walkability	Walking- Utilitarian (Days/wk)	Walking – Any Reason (Days/wk)	Transit Use (Days/wk)	Vehicle Use (Days/wk)	VKT Per week	BMI
Low	1.3 *	3.0 *	0.6 *	5.8 *	354 *	27.3
Medium Low	1.8 *	3.9 *	1.1 *	5.2 *	316 *	26.9
Medium High	2.7 *	4.3 *	1.8 *	4.3 *	245 *	26.5
High	4.0	5.3	2.5	2.8	167	26.0
* A statistically significant difference from the reference category (high walkability)						

Neighbourhood Preference, Neighbourhood Design, Travel Choices & Body Weight – Greater Toronto Area

While the findings discussed in the last section indicate that there is a significant relationship between neighbourhood design and travel choices among Toronto residents, they do not indicate whether walkable neighbourhoods encourage people to walk and take transit more often, or if walkable neighbourhoods simply attract people who are committed to a more active and sustainable lifestyle.

In order to understand how neighbourhood design and neighbourhood preferences affect travel choices and body weights, the survey participants were sorted into four categories based on their neighbourhood preferences and into four categories based on the walkability of their current neighbourhoods. For this assessment, the walkability of neighbourhoods was based on the assessment of survey participants. Residents surveyed from across the GTA were included in this assessment to ensure that there were as many people as possible in each of the eight categories.

GTA survey participants were assigned to one of four groups:

- Those who prefer highly walkable neighbourhoods who live in highly walkable neighbourhoods (**high/high**);
- Those who prefer highly walkable neighbourhoods who live in auto-oriented neighbourhoods (**high/low**);
- Those who prefer auto-oriented neighbourhoods who live in highly walkable neighbourhoods (**low/high**); and
- Those who prefer auto-oriented neighbourhoods who live in auto-oriented neighbourhoods (**low/low**).

Participants in these four different groups were then compared in terms of their travel choices and BMI. The study found that:

- Residents surveyed who prefer, and live in, highly walkable neighbourhoods (**Column 1**) walk almost 60% more often for utilitarian reasons, use transit more often, drive their vehicles less often, and drive about 30% fewer kilometres each week, than people with the same neighbourhood preference who live in auto-oriented neighbourhoods (**Column 2**).
- Residents surveyed who prefer auto-oriented neighbourhoods, and live in, highly walkable neighbourhoods (**Column 3**) will walk about 40% more often for utilitarian purposes, drive less often, and drive about 20% fewer kilometres each week, than those with the same neighbourhood preference who live in auto-oriented neighbourhoods (**Column 4**).

This study also found that neighbourhood design, as well as neighbourhood preferences, is significantly associated with the travel choices of residents surveyed in the GTA.

- Residents surveyed who prefer, and live in, highly walkable neighbourhoods (**Column 1**) will walk 2.5 times as often for utilitarian purposes, use transit 2.6 times as often, and drive about 150 fewer kilometres each week, than residents who prefer, and live in, auto-oriented neighbourhoods. They also have, on average, a BMI that is one point lower. (**Column 4**) (see **Table 14 and Figures 11, 12, 13**).

Figure 11: Utilitarian Walking & Neighbourhood Preferences & Walkability of Current Neighbourhood - GTA

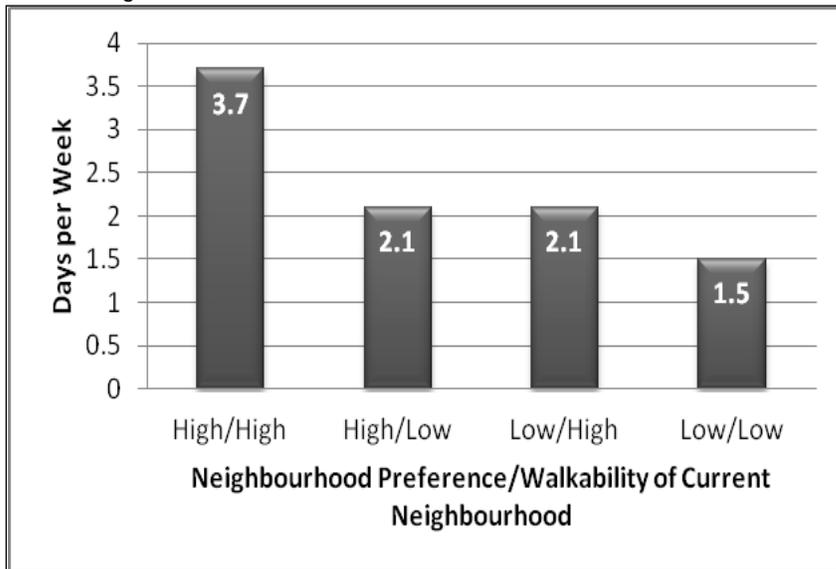


Figure 12: Transit Use & Neighbourhood Preferences & Walkability of Current Neighbourhood - GTA

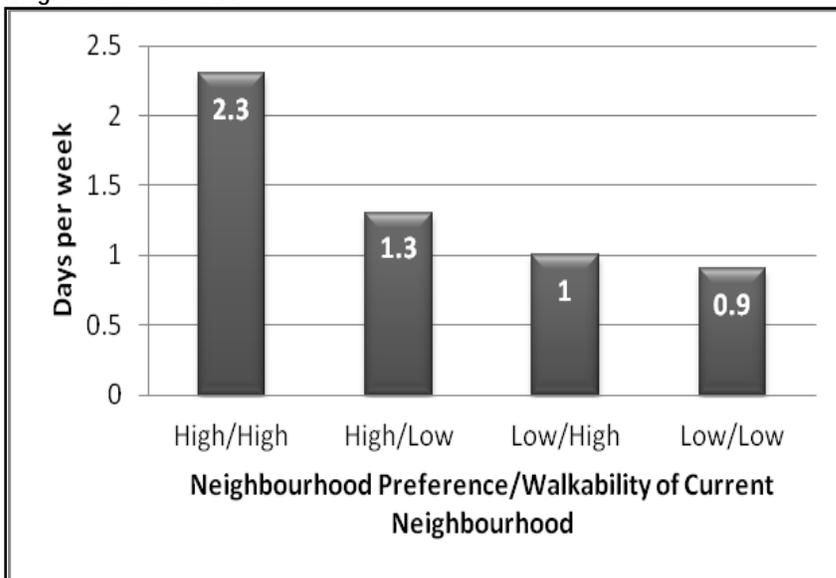
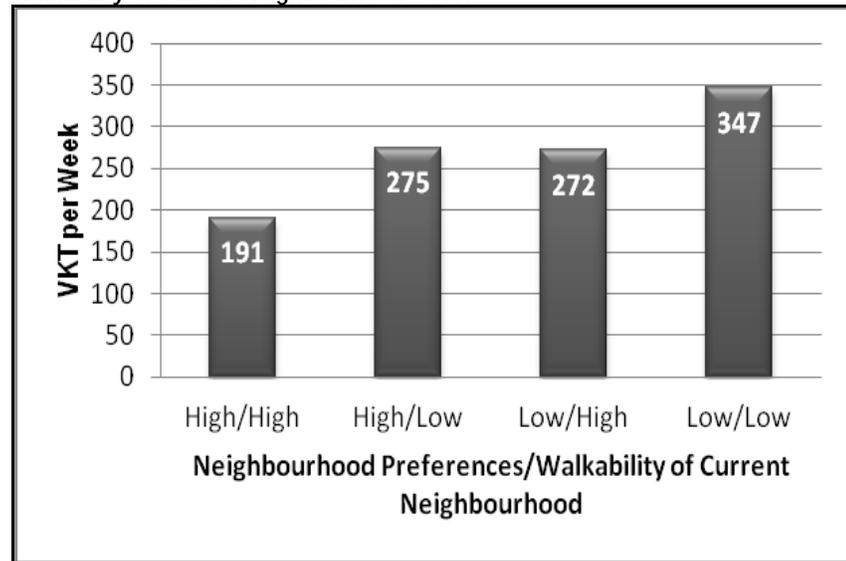


Figure 13: Vehicle Kilometres Travelled (VKT) & Neighbourhood Preferences & Walkability of Current Neighbourhood - GTA



These results provide greater clarity about the association of neighbourhood design and preferences with levels of physical activity and travel choices. **They indicate that neighbourhood design, as well as neighbourhood preferences, is significantly associated with the travel choices of residents in the GTA.** They suggest that:

- Residents in the GTA who have a preference for walkable neighbourhoods use active modes of transportation more often than those who prefer auto-oriented neighbourhoods, particularly when they live in walkable neighbourhoods that support their preference;
- Residents who live in more walkable neighbourhoods in the GTA use active modes of transportation more often than those who live in auto-oriented neighbourhoods, particularly when they have a preference for walkable neighbourhoods;
- Residents in the GTA who prefer, and live in, highly walkable neighbourhoods, use active modes of transportation much more than those who prefer, and live in, auto-oriented neighbourhoods.
- These results are consistent with several other studies that have been directed at understanding the relationship between neighbourhood design and neighbourhood preferences on travel choices, physical activity and BMI (Frank LD et al. 2007; Levin J and LD Frank, 2006).

Table 14: Travel Choices & Body Mass Index (BMI) by the Neighbourhood Preferences & Current Neighbourhood Design - GTA

Walkability Preferred/ Walkability of Neighbourhood	Walking-Utilitarian (Days/wk)	Transit Use (Days/wk)	Vehicle Use (Days/wk)	VKT Per week	BMI
High/High	3.7 +	2.3 +	3.3 +	191 +	26.1
High/Low	2.1*	1.3*	4.8 *+	275*	26.6
Low/High	2.1	1.1	4.8	272	27
Low/Low	1.5	0.9	5.7*	347*	27.1

*A statistically significant difference between categories with different neighbourhoods (same preference).
+ A statistically significant difference between categories with different preferences (same neighbourhood type).

Travel Choices & Obesity – Toronto & the Outer GTA

The residential preferences survey revealed significant differences between the Toronto residents and outer GTA residents surveyed in terms of their levels of obesity, their levels of physical activity, and their travel choices. It suggests that, relative to residents in the outer GTA, Toronto residents:

- Walk about twice as often for utilitarian reasons;
- Use public transit almost four times as often;
- Travel almost half the distance by automobile; and
- Are much less likely to be obese (18% compared to 25%).
- The study results suggest that residents in Toronto walk for exercise, and bicycle, as often as their counterparts in the outer GTA (see Table 15).

Table 15: Travel Choices & Obesity - Toronto & Outer GTA

Variable	Toronto	Outer GTA
Obese (BMI>30) (%)	18.2	24.6
Walk for exercise (days/week)	2.8	2.8
Walk for utilitarian reasons (days/week)	3.4	1.7
Walk for any reason (days/week)	4.8	3.7
Bicycle for any reason (days/week)	1.3	1.3
Use Public Transit (days/week)	2.3	0.6
Use Automobile (days/week)	3.4	5.7
Vehicle kilometres travelled (VKT)	192	344

Toronto & Outer GTA - Commuting Patterns for Work

The residential preferences survey found that there were significant differences between Toronto residents and outer GTA residents surveyed in terms of their commuting patterns for work. It suggests that:

- 40% of residents in Toronto take public transit compared with 14% of residents from the outer GTA;
- Almost one half of Toronto residents (45%) walk or cycle at least part of the way to work compared with 7% of residents in the outer GTA; and
- 4% of Toronto residents drive alone to work compared with 70% of residents in the outer GTA (see Table 16).

Table 16: Commute to Work (% by Mode)		
Mode	Toronto	Outer GTA
Walk	11.5	3.0
Bicycle	3.2	0.
Walk/bicycle to transit	31.0	4.2
Drive to transit	7.9	10.2
Drive alone	28.3	70.2
Car/vanpool	4.0	6.0
Other	2.5	0.8
Work from home	11.5	5.7

Toronto & Outer GTA - School Travel

The survey found that there were significant differences between the school travel patterns of children in the City of Toronto and those of children from the outer GTA as well. It found that:

1. Almost half as many Toronto children travel by school bus to school as children in the outer GTA;
2. About one third as many drive to school on their own;
3. One half of Toronto children walk or ride bicycles part of the way or all of the way to school (51%) compared with one third of children in the outer GTA (34%) (see Table 17).

Table 17: Commute to School (% by Mode)		
Mode	Toronto	Outer GTA
School bus	8.9	15.2
Walk	38.2	30.4
Bicycle	0.5	0.0
Driven	8.4	3.3
Walk/bicycle to transit	12.0	3.3
Driven to transit	2.6	3.3
Drive alone	4.2	13.0
Multiple responses	25.1	19.6

Summary of Findings

Residents in Toronto place a high premium on living in walkable and transit-supportive neighbourhoods. When asked to choose between a highly walkable neighbourhood and an auto-oriented neighbourhood, three quarters of Toronto residents surveyed expressed a strong preference for the walkable neighbourhood, while only 8% expressed a strong preference for the auto-oriented neighbourhoods.

Residents in Toronto expressed strong and consistent support for the walkable options for seven specific neighbourhood features. The Toronto residents surveyed appear to be quite willing to trade-off larger houses and larger lot sizes to live within walking distance of commercial areas and public recreation. They also appear happy to accept mixed housing types and streets with greater foot and vehicle traffic if it allows them to walk, cycle and use public transit to reach their common destinations.

There is a strong latent demand among Toronto residents for more walkable features in their neighbourhoods. The study found a strong latent demand for walkable neighbourhood features. Between 21 and 32% of Toronto residents living in auto-oriented neighbourhoods expressed a strong preference for one or more of the seven walkable neighbourhood features that were missing from their current neighbourhoods.

Residents in Toronto surveyed who live in more walkable neighbourhoods appear to have healthier lifestyles than those who live in less walkable neighbourhoods. They walk more often, use transit more often, drive less often, and drive fewer kilometres each week. They also have lower body weights.

These findings reinforce other studies which suggest that walkable neighbourhoods can provide health, environmental and transportation benefits by increasing the levels of physical activity among residents and reducing vehicle use, emissions of air pollutants and greenhouse gases, and potentially traffic congestion on a per person basis.

Neighbourhood design, as well as neighbourhood preferences, is significantly associated with travel choices. GTA residents surveyed who prefer walkable neighbourhoods walk more, use transit more, and drive less than those who prefer auto-oriented neighbourhoods, particularly when they live in walkable neighbourhoods that support their neighbourhood preference. In addition, those who live in walkable neighbourhoods walk more, use transit more, and drive less than those who live in auto-oriented neighbourhoods, particularly when they have a preference for walkable neighbourhoods.



GTA residents surveyed who prefer, and live in, highly walkable neighbourhoods appear to have much healthier lifestyles, than those who prefer, and live in, less walkable neighbourhoods. They walk almost 2.5 times as often for utilitarian purposes, use transit 2.6 times as often, and drive 150 fewer kilometres each week. They also have lower body weights.

Conclusions

The Walkable City report is primarily a summary of the findings on public preferences for walkable neighbourhoods compared with auto-oriented neighbourhoods. As such, the findings reveal an overwhelming preference for the features of a walkable neighbourhood in the Greater Toronto Area, with that preference being strongest in the City of Toronto.

This study found that the Toronto residents surveyed who are living in walkable neighbourhoods do more walking for utilitarian reasons, take transit more often, and drive less, than those who live in the less walkable neighbourhoods. These findings suggest that people living in walkable neighbourhoods in Toronto are more physically active with less chance of developing chronic diseases, than those who live in less walkable neighbourhoods. They also suggest that there could be significant air quality, climate and traffic congestion benefits associated with walkable neighbourhoods and the travel options they support.

This study also found that neighbourhood design, as well as neighbourhood preferences, is significantly associated with the travel choices of residents surveyed in the GTA. It suggests that GTA residents with a preference for walkable neighbourhoods walk more, use transit more, and drive less, than those with a preference for auto-oriented neighbourhoods. But it also suggests that GTA residents who live in walkable neighbourhoods walk more, use transit more, and drive less, than those who live in less walkable neighbourhoods. It revealed that the impact on the levels of physical activity and travel choices are greatest when the preference for walkable neighbourhoods is aligned with walkable neighbourhoods that support walking and transit use.

Walkability mapping conducted for Toronto illustrates that, while the urban core of Toronto is highly walkable, many areas of the city are not. It also indicates that a number of the neighbourhoods rated low for walkability in Toronto are home to low income residents who can experience increased rates of illness and injury. This is important because walkable neighbourhoods provide so many health and social benefits that are particularly important for low income populations. Walkable neighbourhoods can facilitate physical activity, social interaction, and access to jobs, services, and healthy foods.

This latest study tells us that there is a substantial latent demand for more walkable neighbourhood features among residents in the City. It demonstrates that there are specific neighbourhood features, such as having shops and services within walking distance of homes, and having a variety of small and medium sized food stores within walking distance of homes, where the desires of Toronto residents are not being met by the current supply.

Towards a More Walkable City

Neighbourhoods can be Changed

Where do we go from here? How do we make neighbourhoods across the City more walkable to meet the health needs and preferences of Toronto residents? The path forward is complex.

Collaboration by the public and private sector will be required to revitalize those areas of the City that are currently not very walkable. It means working to ensure that new neighbourhoods are designed to be more walkable and complete with shops, services and parks, and working to introduce walkable neighbourhood features into well established neighbourhoods that are less walkable, when opportunities arise. While much of Toronto is built out, that does not mean that neighbourhoods cannot be changed over time. Old neighbourhoods can be transformed from industrial waste lands into pedestrian-friendly neighbourhoods. Apartment-oriented neighbourhoods can be revitalized with the introduction of shops and services that meet the needs of nearby residents. Suburban neighbourhoods can be made more walkable with the re-development of nearby avenues.

Case Example: West Don Lands

The West Don Land neighbourhood is an excellent example of the ways in which a former industrial area can be re-developed into a walkable and transit-supportive neighbourhood.

Located at the original mouth of the Don River, the West Don Lands neighbourhood is being transformed from former industrial lands into a sustainable, mixed-use, pedestrian-friendly, riverside community through re-development. West Don lands will accommodate a mix of housing, office space, retail/restaurants and staging areas, all just a 15 minute walk to downtown Toronto. The 32 hectare (80 acres) area will feature:

1. 6,000 residential units (20% of which will be affordable rental housing);
2. Up to 1 million square feet of employment, institutional and retail space;

3. At least one elementary school, and two child-care centres;
4. All surrounded by about 9.3 hectares of parks and public spaces.

The streets in the neighbourhood will enhance north south connections to adjacent neighbourhoods and lead to Don River Park. The scale of building heights is in keeping with that of surrounding communities. The West Don Lands will feature a mixture of mid-rise buildings and higher tower buildings in strategic locations. Historical buildings will be preserved and incorporated in new developments.



An innovative street design, called woonerfs, or living streets, will be used for some of the area's local streets. Woonerfs are pedestrian-oriented streets that erase the boundary between sidewalk and street and provide a common public space shared by pedestrians, cyclists and low-speed motor vehicles.

West Don Lands will also have transit available within five minutes of residents and businesses. Streetcars will travel in their own transit corridor on the east side of Cherry and Sumach streets beside the eastern sidewalk. The street design prioritizes transit users and pedestrians. The idea is to create the street as an urban place, not simply a corridor for movement (TWRC, 2012).

Case Example: Black Creek Neighbourhood

The Sustainable Neighbourhood Retrofit Action Plan (SNAP) is an innovative pilot program led by the Toronto and Region Conservation Authority (TRCA) in collaboration with various stakeholders. The City of Toronto is one of the partners in this initiative. SNAP focuses on making

sustainable changes across four core theme areas which include: growing food, managing water in a sustainable manner, conserving energy and implementing renewables, and enhancing the urban forest. It also seeks synergies with a number of complementary themes including health and well-being, job skills training and employment.

SNAP applies to the Black Creek Neighbourhood which is one of the Priority Neighbourhoods (i.e., now called Neighbourhood Improvement Areas) in Toronto located in northwest of the City. It is home to a very diverse population of about 25,000 residents. The neighbourhood is made up of high-rise residential buildings, single-family homes, as well as commercial and institutional developments.

In April, 2011, the Jane-Finch Community and Family Centre, TRCA and Toronto Community Housing broke ground on the Centre for Green Change. Located within the boundaries of the Black Creek SNAP, the Centre will support environmental stewardship, green job skills development and green entrepreneurship for local residents. Once implemented, the SNAP project will improve the built environment by increasing tree cover to provide shade, enhance the local ecosystem and improve air quality, greening parking lots and other paved areas to improve stormwater management, vegetation cover and aesthetics, harvesting rain, improving access to local food, and enhancing green areas such as ravines, hydro corridors private open spaces and local parks for the community to enjoy (TRCA, 2012).

Case Study: The Regent Park

The historical downtown Toronto neighbourhood of Regent Park, one of Canada's oldest and largest social housing communities, is undergoing a significant transformation. Toronto Community Housing is replacing the long-isolated social housing neighbourhood with an innovative mixed-income, mixed-use community.

Over six distinct phases, one billion dollars will be spent over 15 years to tear down decaying social housing complexes, and replace them with mixed-income development that includes private housing available at market rates. The new buildings will conform to strict environmental standards that prioritize energy efficiency.

Construction on the first phase of the redevelopment began in 2006. Developments include retail, commercial and community spaces; as a \$60-million condominium; a coffee shop, grocery store and bank branch; and a new Regent Park Children and Youth Hub.

In April 2010, Toronto Community Housing announced plans for the second phase of the project. Phase Two will include 400 rental units in a combination of styles, as well as condominium units. It includes new

community facilities such as an aquatic centre, the Regent Park Arts and Cultural Centre, a new community centre, and a new park, and new retailers along Dundas Street East.

In November, 2011 two new BIXI bicycle stations were added to the original grid with a station at Dundas and Parliament and a station at Gerrard and Parliament. By the time construction is done in 2018, the existing 2,087 rental units will increase to 5,100 including 3,000 new units to be sold at market price (Toronto Housing, 2012).

What can the Provincial & Federal Governments do?

There is an important role for the provincial and federal governments to establish plans, capital programs, and policies that support and foster the development and re-development of walkable and transit-supportive neighbourhoods.

Ontario Planning Act

The Ontario Planning Act is the provincial legislation which guides development across the province. It identifies the issues of provincial interest that both the province and municipalities "shall have regard for" when establishing land use planning policies including their Official Plans and zoning by-laws.

In its vision statement, the Act identifies a number of issues related to the creation of healthy and liveable communities as issues of provincial interest including:

- The orderly development of safe and healthy communities;
- The protection of public health and safety;
- The adequate provision and distribution of educational, health, social cultural and recreational facilities;
- The adequate provision of a full range of housing, including affordable housing; and
- The promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians (ERA, 2012).

Provincial Policy Statement (PPS)

The provincial government also promotes pedestrian-friendly and transit supportive communities through its Provincial Policy Statement.

The PPS, which provides policy direction on matters of provincial interest related to land use planning and development, guides municipalities when developing their Official Plans and other planning

documents. The PPS encourages planning authorities to foster active communities by:

- "Planning public streets, spaces and facilities to be safe, meet the needs of pedestrians, and facilitate pedestrian and non-motorized movement..."
- Encouraging connectivity within and among transportation systems and modes... and
- Fostering a land use pattern, density, and mix of uses to minimize the length and number of trips and support the development of viable choices and plans for public transit and other alternative transportation modes, including commuter rail and bus" (PPS, 2005).



The PPS also indicates that healthy, active communities should be promoted by, among other things, "providing for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, open space areas, trails and where practical, water-based resources" (PPS, 2005).

In addition, the PPS directs planning authorities to support energy efficiency and improved air quality through land use and development patterns which, among other things, promote:

- "Compact form..."
- The use of public transit and other alternative transportation modes...
- The mix of employment and housing uses that shorten commute journeys and decrease transportation congestion" (PPS, 2005).

Places to Grow Act

The provincial Places to Grow Act 2005 provides a framework for the government to coordinate planning for long-term growth and infrastructure renewal in Ontario (MOI, 2005). It facilitates:

- Decisions on growth that will support future population increases and economic prosperity, maximize infrastructure efficiencies, and promote a healthy environment;
- An integrated approach to growth-related issues that cross municipal boundaries; and
- An emphasis on the economic benefits of planning effectively for growth and the natural environment.

It stipulates that growth plans may include policies, goals and criteria relating to issues such as intensification and density, land supply, expansions and amendments to urban boundaries, location of employment lands, protection of sensitive lands (including agricultural lands and water resources), infrastructure development, affordable housing and community design (MOI, 2005).

Ministry of Transportation – Legislation, Programs, and Policies

Transit-supportive, walkable, complete communities are achieved when transportation systems are coordinated with land use planning. It is therefore important to ensure that provincial transportation plans, transit investments, road safety programs, legislation and policies are aligned with the provincial land use planning directions. For example, there are some important tools, such as the provincial gas tax program, the Highway Traffic Act, the Traffic Impact Study guidelines, and the Ontario Traffic Manuals, which may need to be revisited to ensure that they support the design and delivery of safe, attractive walking, cycling and transit choices in communities across Ontario (TCBC, 2005; MTO, 2009; TTS, 2012).



Infrastructure Investments

Investments in infrastructure can create long-lasting benefits in communities that are striving to build more complete neighbourhoods with walkable features such as public transit, safer pedestrian facilities, parks and public spaces.

In 2008, the governments of Ontario and Canada created a Building Canada Fund, with \$6 billion in funding, to meet infrastructure needs and priorities across the province. Many of the projects funded were designed to create healthier, safer and more vibrant neighbourhoods. For example, project funding was directed at downtown revitalization, sidewalk construction, street lighting, urban multi-use trails and pathways, bicycle lanes, pedestrian links to transit, and other public transit projects (COIF; TTS, 2012).

In 2009, the federal government established a \$4 billion Infrastructure Stimulus Fund to provincial, territorial and municipal construction-ready infrastructure projects. In Toronto, projects included major east-west off-street bike trails, Union Station revitalization, transit improvement projects including for TTC, and GO Rail and Bus Transit in the GTA (COIF; MTO, 2010; TTS, 2012).

Metrolinx – Regional Transportation Plan

Metrolinx was established in 2006 as an agency of the Government of Ontario under the Metrolinx Act. Its goal is to improve the coordination and integration of all transportation modes in the Greater Toronto and

Hamilton Area (**GTHA**). In 2008, Metrolinx launched "The Big Move", a Regional Transportation Plan, which includes the following key strategies:

- Building a regional rapid transit network;
- Enhancing and expanding active transportation; and
- Building communities that are pedestrian, cycling and transit-supportive (Metrolinx, 2008; TTS, 2012).

In 2011, Metrolinx release its Mobility Hubs Guidelines to support transit station area development, which will help achieve more walkable and complete communities throughout the GTHA.

These mobility hubs feature different modes of transportation, residential and employment densities that support transit, a strong sense of place, pedestrian-friendly design, economic vitality, and innovative technology (Metrolinx, 2011; TTS, 2012).

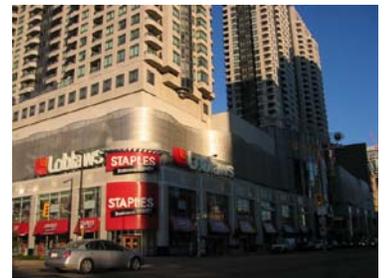
Active transportation is recognized by Metrolinx as part of the solution to the "first and last mile" challenge of how to get transit customers to and from transit stations/stops in a manner that is sustainable and minimizes road congestion and pressures for additional parking lot capacity (Metrolinx, 2008; TTS, 2012).

What can the City do?

City of Toronto Official Plan

The City of Toronto Official Plan (**OP**) is the legal tool that guides development in the City. It begins with a vision for the City that includes, among other elements:

- "Vibrant neighbourhoods that are part of complete communities;
- Affordable housing choices that meet the needs of everyone throughout their lifetime;
- Attractive, tree-lined streets with shops and housing that are made for walking;
- A comprehensive and high quality affordable transit system that lets people move around the City quickly and conveniently;
- Clean air, land and water;
- Green spaces of all sizes and public squares that bring people together;
- A wealth of recreational opportunities that promote health and wellness; and



- A spectacular waterfront that is healthy, diverse, public and beautiful (ERA, 2012).

The OP currently calls for future population and development to be directed to "areas of growth" that are well served by transit, the existing road network, and which have a number of properties with re-development potential. It seeks to strengthen the existing character of neighbourhoods, ravines and open space that make up about 75% of the land in the City. It currently separates apartment neighbourhoods from other neighbourhoods where building heights are limited (ERA, 2012).

The OP commits the City to developing a pedestrian and transit-supportive community. Policy 2.4.8 states that: "An urban environment and infrastructure will be created that encourages and supports walking throughout the City through Policies and practices that ensure safe, direct, comfortable, attractive and convenient pedestrian conditions including safe walking routes to schools, recreation centres and transit." (City Planning, 2012).

The OP includes a complete streets policy. Policy 3.1.1.5 requires that the City accommodate pedestrians, transit, bicycles and automobiles on the city streets. It also identifies the need for street designs that support active transportation, transit and vehicles. Policy 3.1.1.14 requires the City to provide a connected grid of streets between neighbourhoods that create adequate space for pedestrians, bicycles and landscaping, as well as transit, vehicles and utilities (City Planning, 2012).

The OP also addresses elements of neighbourhood design which affect active transportation. Policy 3.3.2 emphasizes the need to create a fine grain of interconnected streets and pedestrian routes and to create a community focal point within easy walking distance of the neighbourhood's residents and workers. (City Planning, 2012).

The OP identifies a number of neighbourhoods that are in need of improvement. Section 2.3 of the OP, entitled, "Stable But Not Static: Enhancing Our Neighbourhoods and Green Spaces", includes a number of policies in a subsection called Healthy Neighbourhoods, that articulates how these stable neighbourhoods should be encouraged to evolve over time. These policies address, among other things, the need to improve and expand existing parks, recreational facilities, libraries, local institutions, transit services and other community services in these neighbourhoods. These policies also identify the need to develop revitalization strategies to improve, among other things, the public realm, streets, sidewalks, existing housing stock, and a range of housing in these neighbourhoods (ERA, 2012).

Planning and Infrastructure - Supporting Documents & Programs

The City has a number of other policies, guidelines and documents that guide and support land use development and infrastructure in the City of Toronto, including the zoning by-laws of the former municipalities of Metro Toronto, urban design guidelines for built form (e.g., Streetscape Manual and Vibrant Streets Guidelines for street furniture), the Toronto Bike Plan, the Toronto Walking Strategy, Toronto's Food Charter, the Toronto Green Standards (ERA, 2012), and the Development Infrastructure Policy and Standards (DIPS) for the geometric design of new local residential public streets (TTS, 2012)

In addition to policies, the City also has programs and initiatives to undertake design work and investments in transportation improvements that can make a difference for walkability. Such projects include Environmental Assessments for transit and street construction, safety and local improvements (such as traffic calming), missing sidewalks program, and streetscape improvements through well-placed street furniture, street trees and other plantings, and lighting (TTS, 2012).

Business Improvement Associations (**BIA**) partner with the City to revitalize main streets through a 50/50 cost-sharing of streetscape improvements through the City's Economic Development and Culture program for BIAs. Modest improvements to streetscape infrastructure (whether through road reconstruction, resurfacing or stand-alone projects), often result in significant increased walkability and foot traffic, which contributes to increased community satisfaction and patronage of local stores and amenities (TTS, 2012).



Toronto Walking Strategy: Everyone is a Pedestrian

In 2009, the City released the Toronto Walking Strategy, a plan to create high quality pedestrian environments across the City and foster a culture of walking in all of Toronto's neighbourhoods. This Strategy built upon the Toronto Pedestrian Charter, which was adopted by City Council in 2002, and the City's Official Plan (Toronto, 2009). It is built around existing City guidelines and programs including: the Vibrant Streets Guidelines, the Coordinated Street Furniture Program, the Essential Sidewalk Links Program, the Accessible Pedestrian Signals, Streetscape Design Guidelines, Discovery Walks program, and the Active and Safe Routes to School program (Toronto, 2009).

The Strategy acknowledges the specific action plans that have been developed to translate Toronto's Official Plan policies respecting public transit and bicycling into action including: the TTC Ridership Growth Strategy, the Transit City Plan, and the Toronto Bike Plan.

The Toronto Walking Strategy is seen as the corresponding action plan for pedestrians (Toronto, 2009). It discusses two types of neighbourhoods in the City; the "streetcar neighbourhoods" built before the post-war era of the automobile, and the "post-war suburbs" built around separated land uses with single family homes in residential neighbourhoods and high-rise apartment buildings built on arterial roads (Toronto, 2009).

The Strategy notes that these "post-war suburbs" have seen the largest increases in population density, new immigrants, and poverty levels in the last 30 years. It identifies these areas as those which will be most challenging to improve from a walkability perspective (Toronto, 2009).

Social Marketing re: Physical Activity, Air Quality & Climate Change

Currently, Toronto Public Health and other Divisions within the City run a number of educational and social marketing programs that aim to:

- Increase the levels of physical activity among residents to reduce rates of chronic disease;
- Shift behaviour to improve air quality and protect the health of residents from poor air quality;
- Shift behaviour to reduce emissions of greenhouse gases to slow climate change.

Among these programs are: the *Walk Into Health* program and the *Live Green Toronto* program.

A number of pedestrian-focused initiatives are also directed at the Priority Neighbourhoods (i.e., now called Neighbourhood Improvement Areas) where the need is most critical including: The Priority Neighbourhoods Project, the Tower Renewal Project, and the Toronto Community Housing Corporation Projects (Toronto, 2009).

The findings of the residential preferences survey could be used to inform these programs; to help residents understand the positive links between neighbourhood design features such as smaller lots, increased residential densities, and mixed housing, on physical activity, air quality and climate change.

What can the Private Sector do?

While the survey suggested that there are residents in Toronto who want auto-oriented development, it demonstrates that there are many more people across the City who strongly prefer walkable neighbourhoods. It also demonstrates that there is a strong latent demand for more walkable neighbourhood features within existing neighbourhoods.



The survey findings indicate that the majority of people in Toronto would prefer to live in neighbourhoods with mixed land uses and mixed housing if it means they can walk to shops, services, transit service and recreational opportunities, even if it means living in smaller homes on smaller lots. It also indicates that Toronto residents would like to see a greater variety of small and medium sized food stores within walking distance of their homes.

These survey findings are consistent with a number of recent studies that have examined the impact of demographic trends on real estate decision-making (residential, commercial and employment). These recent studies have found that the preferences of Generations Y and X, baby boomers, and couples without children, will result in increasing demand for walkable neighbourhood features in housing and employment choices (Brookings Institute; RREEF 2011; ULI, 2012; ULI 2010;).

This suggests the need and opportunity for developers to ensure that new neighbourhoods are designed and developed to be walkable and "complete". It also suggests the need to use re-development opportunities to introduce specific walkable neighbourhood features, such as new shops, small food stores, new transit stops, and more residential density, into existing low walkable neighbourhoods.

Both developers and municipalities should be flexible about reducing the parking requirements for residential, commercial and employment development where there are walking, cycling and transit improvements. Financial and lending institutions need to ensure that financing is available for mixed-use developments, and that requirements are not unduly stringent compared to financing for single-use developments, as this affects the ability of the development industry to undertake walkable and "complete" development projects.

Together, the development industry, financial sector, and public sector, need to collaborate to reduce the barriers to approving, financing and delivering mixed-use, walkable developments (TTS, 2012).

The Ministry of Infrastructure's Ontario Growth Secretariat has produced a series of case studies of mixed-use, residential and employment developments that exhibit walkable features, high quality urban design, and economically successful projects by developers at www.placestogrow.ca.

It is helpful for not only developers to share best practices in designing for active transportation in their industry, but for other industry groups such as the Institute of Transportation Engineers, Ontario Professional Planners Institute, Ontario Traffic Council, Professional Engineers of Ontario, and Transportation Association of Canada, to ensure that their practices reflect design standards and guidelines that support healthy, walkable complete communities (TTS, 2012).

What can Community Groups do?

Organize around Re-Development Processes



In several communities in Ontario, community groups have organized around re-development proposals to improve their neighbourhoods. For example, in Halton Region, community groups have organized walkability workshops, with support from public health and consultants with expertise in land use planning, to help citizens assess the walkability of their neighbourhoods, both in terms of neighbourhood design and in terms of pedestrian and cycling infrastructure, aesthetics, and access to trails and open space. The reports from these workshops are used by the community groups and municipal decision-makers to identify concrete improvements that should be prioritized for planning processes, fund raising and budgeting (Perrotta, 2011).

Organize around Official Plans, Transportation Plans & Environmental Assessments

In several communities in Ontario, community groups, with support from public health staff, have organized around land use, transportation planning and environmental assessment processes to advocate for policies and plans that support active transportation and public transit. In Niagara Region, for example, Healthy Living Niagara, a partnership of 35 community groups and volunteers, submits comments on land use and transportation planning documents proposed for the local municipalities in their Region. In some cases, they have enlisted the services of an external consultant with expertise in land use planning to assist with the review and development of comments on these documents (Perrotta, 2011).

The Ontario Ministry of Municipal Affairs and Housing (MMAH) and the Ontario Professional Planners Institute (OPPI) have prepared a useful guide, **Planning by Design: a healthy communities handbook**, to assist community groups and residents who are working to improve their neighbourhoods (MMAH, 2009).

Educate the Public about Walkable Neighbourhoods

Several public health units in Ontario have conducted a *WalkON* survey which found that, while residents in their communities want walkable neighbourhoods, they do not always understand which features are associated with a walkable neighbourhood. For example, the Simcoe Muskoka District Health Unit (SMDHU) found that, while many residents in their district want to live within walking distances of shops and services, they also want street designs that do not support this option (SMDHU, 2008).

There are echoes of these findings in the GTA survey where residents in the outer GTA express a strong preference for walkable neighbourhoods but divided preferences about specific neighbourhood features that would support the walkability of their neighbourhoods. This suggests that education is needed to help residents understand which neighbourhood features would support the active and sustainable lifestyles they are seeking.

What can Residents do?

The GTA survey indicates that residents across the GTA, and particularly in the City of Toronto, want more walkable neighbourhoods with easy access to transit service, recreational opportunities, and shops and services, particularly small and medium sized food stores. So as residents, there are things that you can do to help make your neighbourhood more walkable:

1. Support increased residential and commercial density on main streets, transit corridors, and major arterial roads in your neighbourhood.
2. Take your business to local shops and services to ensure their viability.
3. Make sure you support small food shops and restaurants in your neighbourhood that offer fresh and healthy foods.
4. Support new townhouses and apartment buildings that are properly designed for your neighbourhood. They can help support local shops and restaurants and efficient transit service that you appreciate.
5. Support the development of bike lanes and bike share programs. They will help you and your family to be more physically active. And they can reduce the number of vehicles on your streets and improve local air quality.
6. Encourage and support the development of sidewalks on both sides of your streets where possible. Sidewalks make it safer and easier for people of all ages and abilities to get physical activity and to get to the shops and services they need.
7. Demand better designed streetscapes to support walkability, a vibrant local economy, and sense of community.
8. Support lower speed limits and innovative street re-designs that improve conditions for walking, cycling and transit in your neighbourhood. They will make your streets safer for everyone.

9. Make use of public transit service in your neighbourhood. The more you and your neighbours use transit in your neighbourhood, the more frequent service will be offered.
10. Plant trees in your front yard to make walks in your neighbourhood more appealing for everyone, and to provide shade and cooling in the summer.
11. Participate in community groups that are working to improve your neighbourhood. Conduct a Walkability Audit for your neighbourhood which can be found at www.janeswalk.net/walkability/toolkit.

REFERENCES

- Basrur, Dr. Sheela. (2005) 2004 Chief Medical Officer of Health Report: Healthy Weights, Health Lives. Toronto, Ontario: Queen's Printer for Ontario. 2005.
- Besser & Dannenberg. (2005) Walking to public transit: Steps to help meet physical activity recommendations. American Journal of Preventive Medicine.
- Birmingham CI, Muller JI, Palepu A et al. (1999). The cost of obesity in Canada. Canadian Medical Association Journal 1999;169:483-438.
- Block JP et al. (2004). Fast food, race/ethnicity and income: A geographic analysis. American Journal of Preventive Medicine. 27(3): 211-217.
- Boer R et al. (2007). Neighbourhood Design and Walking Trips in Ten U.S. Metropolitan Areas. American Journal of Preventive Medicine. April, 32.
- California Air Resources Board and California Environmental Protection Agency (CARB/CALEP). (1997) The Land Use - Air Quality Linkage: How Land Use and Transportation Affect Air Quality.
- Cameron et al. (2005) Local opportunities for physical activity and sport; Trends from 1999-2004. Canadian Fitness and Lifestyle Research Institute.
- Canada-Ontario Infrastructure Funding website (COIF): www.bcfontario.ca
- Canadian Fitness and Lifestyle Research Institute (CFLRI). (2005) Cost of Physical Inactivity.
- Canadian Institute for Health Information. (2004) Overweight and Obesity in Canada: A Population Health Perspective.
- Canadian Medical Association (CMA). (2008) No Breathing Room: National Illness Costs of Air Pollution.
- Canadian Medical Association. (2007). 2006 Canadian Clinical Practice Guidelines on the Management and Prevention of Obesity in Adults and Children. Canadian Medical Association Journal, 2007;176 (8 Suppl). <http://www.cmaj.ca/content/suppl/2007/09/04/176.8.S1.DC1>
- Centres for Disease Control and Prevention (CDC). (2010). Designing and building healthy places.
- City Planning. (2012). Personal Communication. Paul Bain, Project Manager, City of Toronto. March 2012.
- Colley, R et al. (2011a) Physical activity of Canadian adults: Accelerometer results from the 2007 to 2009 Canadian Health Measures Survey. Health Reports. Vol 22, No.1. March 2011.
- Colley, R et al. (2011b). Physical activity of Canadian children and youth: Accelerometer results from the 2007 to 2009 Canadian Health Measures Survey. Health Reports. Vol 22, No.1. March 2011.
- Drewnowski, A. (2003). Fat and sugar: an economic analysis. Journal of Nutrition. 133: 283S-840S.
- E.R.A Architects Inc. (2011). Roundtable Background Discussion Paper. Prepared for Toronto Public Health. (January 2012 Draft).
- Frank, LD. (2000) Land use and transportation interaction: Implications on public health and quality of life, Journal of Planning Education and Research.

Frank LD, Engelke P, & Schmid T. (2003) Health and community design: the impacts of the built environment on physical activity. Island Press.

Frank L and Chapman J. (2004) Integrating Travel Behaviour and Urban Form Data to Address Transportation and Air Quality Problems in Atlanta. Final Report to the Georgia Department of Transportation and Georgia Regional Transportation Authority. GDOT Research Project No. 9819, Task Order 97-13. April 2004.

Frank LD et al. (2006). Many Pathways from Land Use to Health - Associations between Neighbourhood Walkability and Active Transportation, Body Mass Index, and Air Quality", Journal of the American Planning Association.

Frank LD et al. (2007). Stepping towards causation: Do built environments or neighbourhood and travel preferences explain physical activity, driving and obesity. Social Science & Medicine. Vol. 5

Frank LD (2008). An Evidence and Best Practices Based Review for the Development of a Health Assessment Tool. Prepared for the Regional Municipality of Peel, Canada.

Frank LD, JF Sallis, BE Saelens, L Leary, K Cain, T Conway, P Hess. (2009) The Development of a Walkability Index: Application To the Neighborhood Quality of Life Study, British Journal of Sports Medicine. Volume 10: 1136

Friedman, M. S. et al. (2001). Impact of changes in transportation and commuting behaviours during the 1996 Summer Olympic Games in Atlanta on air quality and childhood asthma, Journal of the American Medical Association. Vol. 285: 897-905.

Gauvin L. et al. (2008). Association between Neighbourhood Active Living Potential and Walking. American Journal of Epidemiology. April 167(8).

Halton Region Health Department (HRHD). (2009). Creating Walkable and Transit-Supportive Communities in Halton.

Health Canada. *Canadian Guidelines for Body Weight Classification in Adults* (Catalogue H49-179) Ottawa: Health Canada, 2003.

Heart and Stroke Foundation of Canada. (2011). Community Design, Physical Activity, Heart Disease and Stroke (Position Statement). <http://www.heartandstroke.ca/positionstatements>

Hess P., et al. (1999). Site Design and Pedestrian Travel. Transportation Research Record: Journal of the Transportation Research Board. Vol 1.

Jackson, LE. (2002). The relationship of urban design to human health and condition. Landscape and Urban Planning. Volume 64.

Katzmarzyk P, Gledhill N, Sheppard RJ. (2000) The economic burden of physical inactivity in Canada. Canadian Medical Association Journal. Nov 28: 163(11).

Katzmarzyk P, Ardern CI. (2004). Overweight and obesity mortality trends in Canada 1985-2000. Canadian Journal of Public Health. 2004;95(1):16-20.

Kuo FE et al. (1998). Fertile ground for community: inner-city neighbourhood common spaces, American Journal for Community Psychology. Volume 26(6).

Lawrence Frank and Company, Dr. James Sallis, Dr. Brian Saleens, McCann Consulting, GeoStats LLC, and Keven Washbrook, (LFC et al.). (2005). A Study of Land Use, Transportation, Air Quality and Health in King County. WA. Prepared for King County Office of Regional Transportation Planning.

Lee C and Moudon AV. (2004) Physical activity and environment research in the health field: Implications for urban and transportation planning practice and research. *Journal of Planning Literature*. 19(2), 147-181.

Levin, Jonathan and Larry D Frank. (2006). Transportation and land-use preferences and residents' neighbourhood choices: the sufficiency of compact development in the Atlanta region. *Transportation*.

Maddock J. (2004). The relationship between obesity and the prevalence of fast food restaurants: State-Level Analysis. *American Journal of Health Promotion*. 19(2):137-143.

Metrolinx. (2008). The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area.

www.metrolinx.com/en/regionalplanning/bigmove/big_move.aspx

Metrolinx. (2011). Mobility Hub Guidelines for the Greater Toronto and Hamilton Area.

www.metrolinx.com/en/projectsandprograms/mobilityhubs/mobility_hub_guidelines.aspx

Ministry of Infrastructure (MOI). (2005). The Places to Grow Act, 2005 (Bill 136). www.placestogrow.ca

Ministry of Transportation (MTO). (2009). Sustainability inSight. www.mto.gov.on.ca/english/sustainability/strategy/MTO_sustainabilityreport-en.pdf

Ministry of Transportation (MTO). (2010). Press Release. <http://news.ontario.ca/mto/en/2010/10/canada-strategic-infrastructure-fund.html>

Ministry of Municipal Affairs and Housing (MMAH) and Ontario Professional Planners Institute (OPPI). (2009). Planning by Design: a healthy communities handbook. <http://www.mah.gov.on.ca/AssetFactory.aspx?did=7171>

Morland, K. (2004). The contextual effect of the local food environment on resident's diets: the atherosclerosis risk in community study. *American Journal of Public Health*. 92(11): 1761-1767

Perrotta, K. (2011). Public Health and Land Use Planning: How Ten Public Health Units are Working to Create Healthy and Sustainable Communities. Prepared for the Clean Air Partnership (CAP) in partnership with the Ontario Public Health Association (OPHA). Toronto: April 2011. 230 pages.

Pulleyblank-Patrick, S et al. (2006). Understanding the relationship between public health and the built environment: A report prepared for the LEED-ND core committee.

Region of Waterloo Public Health (RWPH). (2005). Towards a Healthy Food System for Waterloo Region. Interim Report.

Reidpath DD et al. (2001). An ecological study of the relationship between social and environmental determinants of obesity. *Health and Place*. 3(2002):141-145.

Saelens, et al. (2003). Environmental correlates of walking and cycling: Findings from the transportation, urban design, and planning literature, *Annals of Behavioural Medicine*.

Raine, KD. (2005). Determinants of healthy eating in Canada. *Canadian Journal of Public Health*. 96(3): S8-S14.

RREEF. (2011). Boomers, Echo's and X's Generational and Other Structural Shifts and Their Impacts on Future Demand for Real Estate in the Coming Decade. No. 81. May.

Simcoe Muskoka District Health Unit (SMDHU). (2008) WalkON 2008 Survey Report. Prepared by Myrna Wright, Health Promotion Specialist. 69 pp. October 2008.

Statistics Canada. (2012). Census Population 2011. Updated February 2012.

The Conference Board of Canada. (2005). The Premier's Leaders Forum on Strategic Growth. www.conferenceboard.ca/e-Library/abstract.aspx?did=1349

Toronto. (2009). Toronto Walking Strategy: Everyone is a Pedestrian. City of Toronto: 2009.

Toronto and Region Conservation Authority (TRCA). (2012). Personal Communication. Adriana Gomez, Project Manager, Watershed Planning Ecology Division. March 2012.

Toronto Housing. (2012) Regent Park.
<http://www.torontohousing.ca/regentpark>

Toronto Public Health (TPH). (2004) Air Pollution Burden of Illness: 2004 Summary. Toronto, Ontario.

Toronto Public Health (TPH). (2009) Air Pollution Burden of Illness from Traffic in Toronto. Toronto, Ontario.

Toronto Public Health (TPH). (2010) Toronto's Health Status 2010.

Toronto Public Health (TPH). (2011) Healthy Toronto by Design. Toronto, Ontario.

Toronto Transportation Services (TTS). (2012). Personal Communication. Janet Lo, Project Officer, Pedestrian Projects, City of Toronto. March 2012.

Toronto Waterfront Revitalization Corporation (TWRC). (2012).
http://www.toronto.ca/waterfront/news_wdl_backgrounder.htm

Urban Land Institute (ULI) and John McIlwain. (2010). Housing in America: The Next Decade.

Urban Land Institute (ULI) and PWC (2011). Emerging Trends in Real Estate 2012 – Canadian Edition.

Victoria Transport Policy Institute. (2011). A new Social Equity Agenda for Sustainable Transportation. Draft for Discussion. March 3, 2011.

World Health Organization & UN-HABITAT (WHO). (2010) Hidden cities: Unmasking and overcoming health inequities in urban settings. Geneva, Switzerland.

World Health Organization (WHO). (2011). Health co-benefits of climate change mitigation - Transport Sector.