Official Plan Review

Peel 2041

REGION OF PEEL

HEALTH AND THE BUILT ENVIRONMENT

Regional Official Plan Review Discussion Paper

November 7, 2013

Acknowledgements

Thank you to the following for their contributions to the content of this report:

Gladki Planning Associates
Brent Moloughney

Table of Contents

INTRODUCTION

The way people led their lives has changed dramatically in recent decades. Alterations in our physical, social and economic environments have exerted powerful influences on people's overall caloric intake, on the composition of their diets, and on the frequency and intensity of physical activity at work, at home and during leisure time.[1] We less frequently walk or cycle to work, school and/or to run errands. We are more sedentary at work and we use a multitude of labour-saving devices at home. Combined with major changes in the food environment, the consequences of these societal changes include a population that is less active and fit, obesity rates that have doubled in a few decades and ever-increasing rates of diabetes. Not only does this situation reflect a direct threat to the health and wellbeing of the residents of Peel, but it hampers our productivity as a society, and further stretches the capacity of our healthcare system.

As the Region's public health unit, Peel Public Health is mandated by the *Ontario Public Health Standards* to assess and report on the state of, and factors affecting, the health of the public. Our responsibilities also includes working with municipalities to support healthy public policies to create or enhance the built environment to support health.[2] There are a multitude of ways the built environment affects health and current epidemics. Historically, public health worked with community designers to address infectious diseases that plagued communities more than a hundred years ago. It is increasingly apparent today that community design will again be critical to address our current epidemics of obesity, diabetes, physical inactivity and sedentary behaviour. This aspect of the built environment will be the focus of this paper.

Recognizing the importance of these health issues, a number of priorities, strategies and policies have been pursued by the Region of Peel and its municipalities over the past decade. **Considering the magnitude and pervasiveness of the challenge, it is our assessment that current approaches are inadequate to achieve sufficient change in development form to significantly impact the health of the public.** It is our responsibility to signal that there is a need to do more and at minimum, to make decision-makers aware that the current scale of initiatives is unlikely to impact current trends in physical activity or the diabetes rates of Peel residents. **The extent of required change is considerable, and more aggressive action is required to have impact.**

This discussion paper summarizes the nature of the problem, actions to-date, and analyzes potential opportunities and barriers for action. The paper concludes with recommendations for amendments to strengthen the Region of Peel's Official Plan, and related implementation considerations.

HEALTH AND THE BUILT ENVIRONMENT

Rediscovering the Link Between Community Design and the Public's Health

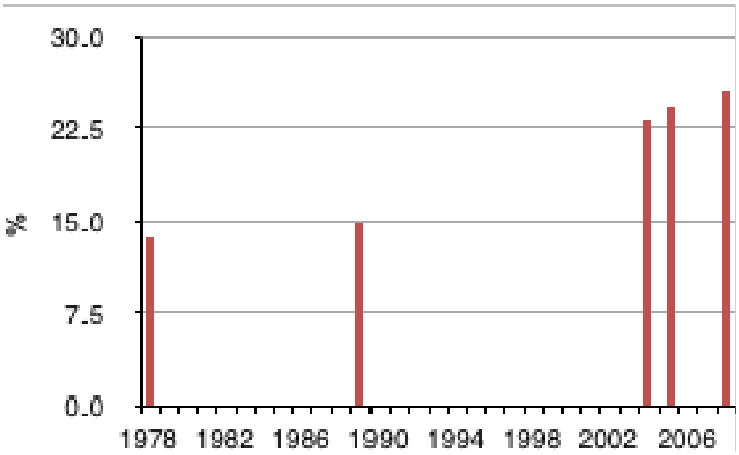
The modern field of public health emerged in the latter half of the 1800s as waves of epidemics of cholera, typhus and other conditions struck cities in Europe and North America. While detailed understanding of the nature of the causative micro-organisms and their spread were still in their relative infancy, what was clear was that urban living conditions were at the heart of the situation. Pouring sewage into open street gutters and housing people in squalid conditions needed to change. Reforms in planning codes and infrastructure were societal interventions to combat the challenge of infectious disease. This resulted in the provision of clean drinking water and sewage systems, the ventilation of living spaces, ensurance of sunlight and air circulation to streets, and the establishment of public parks. These innovations remain with us today, often unnoticed as givens of community design, and have been responsible for a considerable portion of the increase in life expectancy witnessed over the last 150 years.

In recent decades, a new type of epidemic has emerged. More insidious in nature, this epidemic of chronic diseases is not caused by micro-organisms, but rather, in many instances, can be characterized as "diseases of excess energy." The rates of these conditions, which include obesity, diabetes, heart disease, strokes and some cancers, are influenced by circumstances in which energy consumption exceeds energy use. The parallel with the experience of a century ago is that the design of communities holds an important key in how we tackle the prevention of these conditions.

Magnitude of the Health Problem

Obesity is the visible indicator of a larger population-wide challenge of unhealthy eating, physical inactivity and sedentary behaviour, which leads to multiple adverse health outcomes (i.e., diabetes and many other chronic conditions). Figure 1 depicts obesity rates in Canada almost doubling in a period of just a few decades.

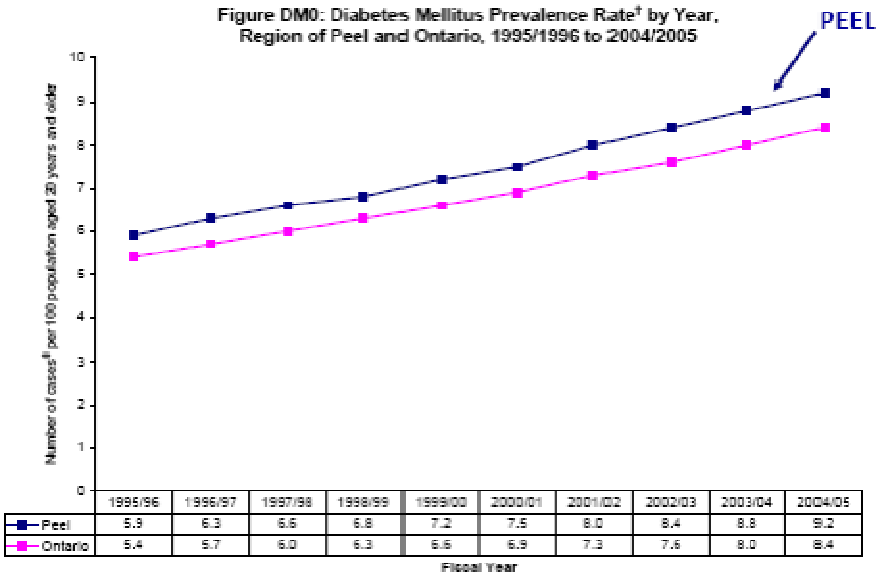
Figure 1: Trend in Measured Obesity, Aged 18+, Canada



Source: CIHI, PHAC. Obesity in Canada, 2011.

Mirroring the trend in obesity, rates of diabetes have been steadily increasing, with Peel's rates exceeding those of the province overall (see Figure 2).

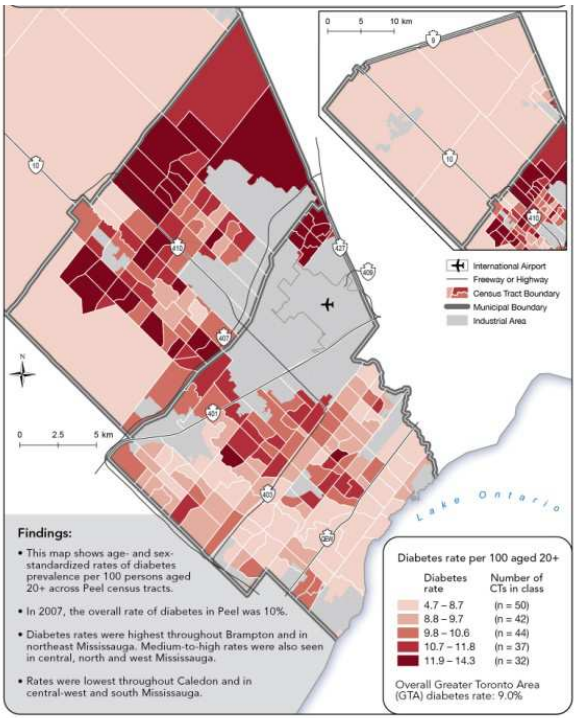
Figure 2: Trends in Rates of Diabetes, Peel Region and Ontario



Currently it is estimated that one in 10 adults living in Peel Region have been diagnosed with diabetes; and without intervention, this is projected to rise to an estimated one in six by 2025.[3]

An environment that promotes obesity has implications across society and will not affect everyone equally. While the average prevalence of diabetes for the Region is 10 per cent, Figure 3 shows that rates of diabetes vary considerably by location within Peel. Some parts of the Region have rates as high as 11.9 to 14.3 per cent.

Figure 3: Diabetes Prevalence Rates by Census Tract in Peel Region, 2006



Source: Region of Peel. Diabetes Atlas for the Region of Peel. 2013

Ironically, while our province is the destination for many newcomers seeking a better way of life, many are at a higher risk of diabetes and heart disease when exposed to our "obesigenic environment."* For example, while recent immigrants to Ontario tend to have lower rates of obesity, rates increase as more western diets and/or sedentary lifestyles are adopted.[4] Of further concern, some populations, such as those of South Asian decent, are at much higher risks of developing diabetes and cardiovascular diseases.[5,6]

Patterns of behaviour are also being established for future generations. The 2011 Region of Peel Student Health Survey found that 37 per cent of the males and 27 per cent of the females in grades 7 to 12 were classified as overweight/obese. The assessment of fitness levels of students in **grade 9 indicated that more than one-third of males and nearly half of females failed to meet current standards of acceptable cardio-respiratory fitness**, and approximately three-quarters of all grade 9 students' musculoskeletal fitness scores fell within a range that is associated with some to considerable health risks.[7]

Overall, the estimated costs for physical inactivity and obesity in Ontario in 2009 were $3.4 billion and $4.5 billion, respectively.[8] The current and future impact of the epidemic of chronic diseases is one of the most important threats to the health of the public. In addition to the direct impact on the health and wellbeing of residents, it poses a considerable burden on and strains the sustainability of the healthcare system as it copes with increasing numbers of

* Obesigenic environment: the sum of the influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals and populations.

individuals with chronic conditions who require ongoing treatment and monitoring. Furthermore, these chronic conditions reduce the productivity of the workforce due to the risks for disability and premature death.

The Underlying Causes

At a basic level, energy intake greater than energy expenditure is the immediate cause of the obesity epidemic. However, why this has happened on such a large scale is more complicated. As was noted earlier, the way people have led their lives over the past 20 to 30 years has changed dramatically. With unintended consequences, various forms of physical activity have essentially been removed from people's lives. Examples include:

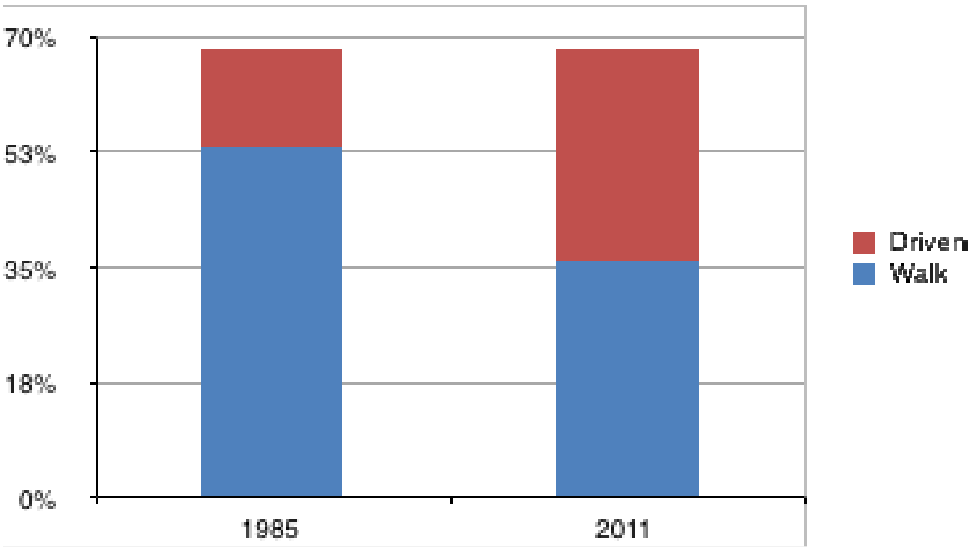
- Decrease in and disincentives for the need to walk
- Decline of manual occupations
- Perceived safety concerns for children, leading to reduced opportunities for outdoor play
- More "screen time"
- More home appliances
- Design of neighbourhoods to support the use of cars and not active transportation[9]

Many characteristics of neighbourhood design collectively contribute to reduced physical activity, obesity and a wide range of chronic diseases, including diabetes.[10,11] These characteristics include:

- Low-density, single family dwellings and large lot sizes
- Automobile dependency even for short trips
- Large distances from services and street patterns that are obstacles to walking and biking to nearby destinations (if they exist)
- Spiralling growth outward from existing urban centres
- Leapfrogging patterns of development
- Strip development (e.g., homes arranged along rural highways present traffic safety hazards, and commercial strips of fast food chains and large retail stores fronted by extensive parking lots cater to automobile access)
- Undefined edge between urban and rural areas[12]

Decreases in the extent that children walk to school are just one example of the societal changes that have occurred. Anecdotally, the common experience of middle aged and older adults was walking to school, whereas now there are long lines of cars and school buses driving children to the door. This observation is confirmed by data from Metrolinx that reports that among GTA children, 36 per cent of children walk to school while 32 per cent are driven by car (see Figure 4). In contrast, 53 per cent of children walked to school in 1985 and only 15 per cent were driven. Within Peel, recent data indicates that 31 per cent of children walk to school from home while 41 per cent are driven to school.[7]

Figure 4: Reduction of Children's Walking to School



Source: Metrolinx. Active and Sustainable School Travel. 2012. Available from: http://www.metrolinx.com/en/projectsandprograms/schooltravel/school_travel.aspx .

Walking to school is an example of "utilitarian physical activity", which is an activity that is part of daily life versus an optional choice, such as recreational activity. Over time, while rates of recreational activity have remained relatively steady, major declines have been observed in activity at work (occupational), activity at home (domestic) and walking or cycling to work and school.[13]

Major changes have also occurred regarding the food-related environment including:

- Readily available inexpensive, energy-dense, nutrient-poor foods
- Increased frequency of eating out with associated increases in portion sizes
- Aggressive marketing of less healthy foods, beginning in early childhood[9]

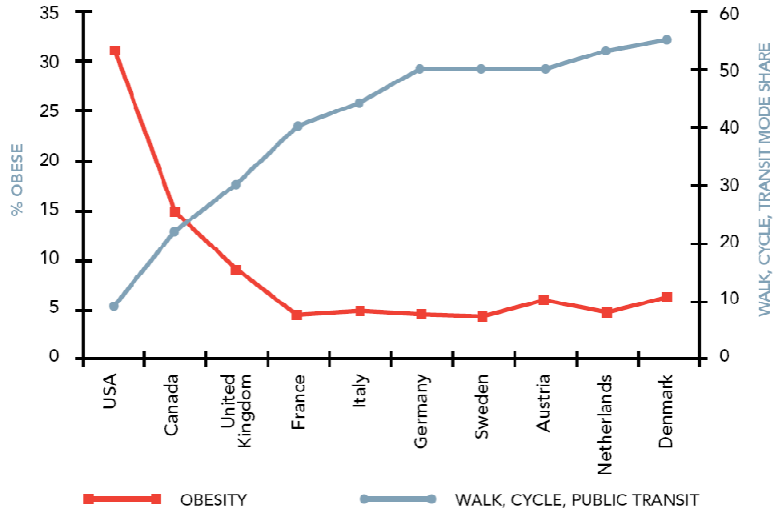
These societal trends combined with people's physiology, which is geared to accumulate and preserve weight, are the underlying causes of obesity and associated diseases. "It is now well accepted that the causal pathways driving the increases in obesity prevalence involve societal and environmental changes laid onto the underlying, but relatively stable genetic and behavioural susceptibility of individuals."[14]

The Importance of Physical Activity

The foregoing has given particular emphasis to physical activity in the context of obesity and diabetes. While important, this is only part of the story. The health benefits of physical activity are immense. For example, the 150 minutes per week of moderate- to vigorous-intensity activity recommended by the Canadian Physical Activity Guidelines are associated with a 10 to 22.5 per cent lower risk of death from all causes. In response to this, considerable efforts have

been made in recent decades to encourage greater leisure time activity. Unfortunately, the proportion of the population engaging in leisure time activity has changed little over time since not everyone is interested in higher intensity activity and time constraints in daily life are a major barrier to extra activity. Accordingly, there is growing recognition that physical activity targets will only be achieved by helping people to build activity, such as walking and cycling, into their daily lives.[16] For example, countries with the highest rates of active transportation* and transit use have lower obesity rates (see Figure 5).

Figure 5: Population-Level Relationship between Obesity and Combined Modal Share from Walking, Cycling and Transit



Source: Transport Canada. Active transportation in Canada: a resource and planning guide. Ottawa, 2011.

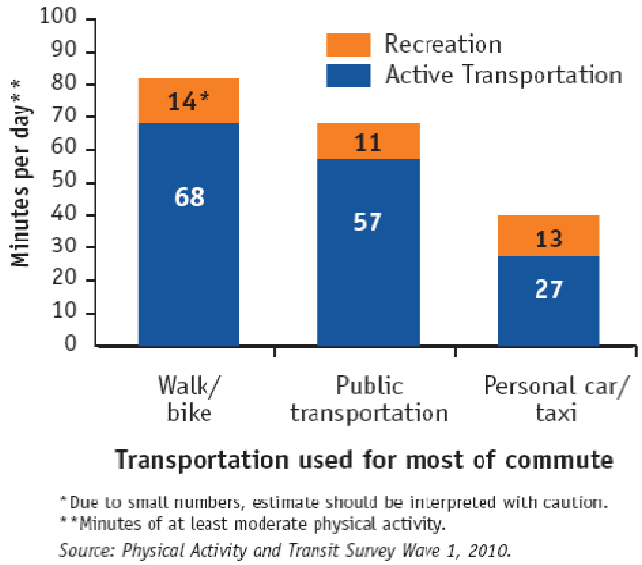
> "Walking and cycling are the principal means by which we can build physical activity into our lifestyles and to stay healthy, become more healthy and/or reduce our risk of developing [many] conditions and diseases; including coronary heart disease, stroke, type 2 diabetes, cancer, obesity and mental health problems."
>
> Source: Davis A. Value for money: an economic assessment of investment in walking and cycling. UK Department of Health, 2010.

In Figure 5, the U.S. and Germany have markedly different results. In a separate analysis of these two countries, researchers found that rates of achieving 30 minutes of walking and/or cycling per day is not only three times higher in Germany than in the U.S., but that larger increases in active transportation rates are occurring in Germany as well.[17] In the U.S. only 36 per cent of trips shorter than one mile were made by walking or cycling, while 70 per cent of Germans used active transportation for trips of this distance.

Results from New York City indicate the importance of active transportation to overall levels of physical activity (Figure 6). Overall, the average duration of active transportation is much greater than recreational activity for any choice of commute mode. However, those primarily commuting by active transportation or using public transit accumulate over a half hour a day of more active transportation physical activity than those relying on personal car or taxi.

* Active transportation refers to any form of human-powered transportation, e.g., walking, cycling, using a non-powered wheelchair, in-line skating or skateboarding. There are many ways to engage in active transportation, whether it is walking to the bus stop or cycling to school/work.

Figure 6: Average Daily Active Transportation and Recreation Activity among New Yorkers Who Work Outside the Home



Source: New York City Department of Health and Mental Hygiene. Health benefits of active transportation in New York City. NYC Vital Signs, May 2011.

The role of public transit in Figures 5 and 6 may at first seem odd. Public transit's primary role is to reduce traffic congestion; however, from a health perspective, public transit not only reduces vehicle emissions that contribute to a range of adverse health outcomes, it also increases active transportation because people using transit tend to walk more in order to access and leave the transit network, as well as to transfer between routes or modes.[18] Furthermore, as will be described in more detail later, there is considerable overlap in the development form required to support active transportation and efficient public transit. There is increasing evidence of the health benefits of utilitarian or active transportation. Researchers have observed in multiple studies that walking or cycling to work reduce the risks to being overweight, and to hypertension, diabetes or heart disease.[19,20] One U.S. study found that every additional kilometre walked per day is associated with a 4.8 per cent reduction in obesity, whereas each hour spent in a car is associated with a 6 per cent increase in the likelihood of obesity.[21] Results from a major study from Copenhagen indicated that cycling three hours a week to work reduced the risk of death from all causes by 28 per cent. Another article containing a summary of multiple studies indicated that walking 29 minutes a day each day of the week reduced the risk of death from all causes by 22 per cent.[22]

> Walking 29 minutes a day, seven days a week reduces the risk of death from all causes by 22 per cent!
>
> Source: WHO. Health economic assessment tools (HEAT) for walking and for cycling. Methodology and user guide. Copenhagen, 2011.

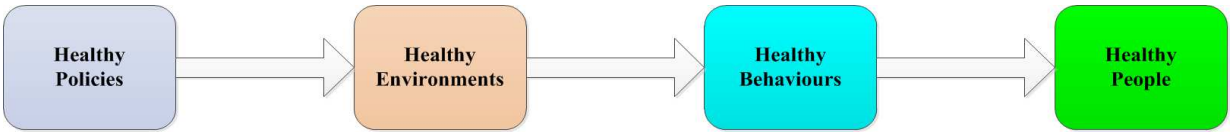
The potential for active transportation is not limited to commuting to work or school. Walking and cycling can also be used to replace a proportion of short distance trips currently conducted by car. For example, an analysis in the Midwest U.S. (population 31 million) estimated that 687 deaths would be prevented if 50 per cent of car trips with a one-way distance of 4 km or less were replaced by cycling.[23] Many additional deaths could also be prevented due to the improvement in air quality.

A related issue is the increasingly recognized risk of being sedentary. Being sedentary has harmful effects on different body systems, including adverse effects on lipoprotein levels and glucose tolerance, reduction in bone bass/density, and changes in blood pressure and vascular function.[24] Moving throughout the day is not only directly beneficial, but also addresses the risk of being sedentary.

Creating Environments that Support Physical Activity

Much more attention is required to make walking and cycling a normal part of people's lives. The immediacy of needing to get somewhere is met with the convenience and availability of human power to do so. In other words, the intent is to make the healthy choice the default option.

Supporting greater activity that is woven into daily life has direct implications for how we design communities. The practical challenge is translating what we know about the causes of health into policies that by default, support healthier behaviours. Conceptually, the logic is shown in the following diagram.



Existing evidence and understanding indicates the need for comprehensive policies to support physical activity including:

- Walkability of the living environment
- Opportunity for non-motorized transport
- Access to opportunities for physical exercise (including cost)
- Safety of walking and transport environments*

* Keener et al. Recommended community strategies and measurements to prevent obesity in the United States: Implementation and measurement guide. CDC: Atlanta, 2009.

Walkability is not merely whether or not there is a sidewalk or path, but also whether there is a nearby destination. Similarly, cyclability is not merely about bike paths, but also about secure parking. Safety and aesthetics are important for both activities. While it was novel at the time to ensure communities had access to clean water, sewage systems and eventually utilities, these are automatic planning considerations. We need to think similarly about how we design communities to support activity, as well as addressing a range of individual and social factors. For example, the Region of Peel's Active Transportation Study highlights the need for programming to change attitudes and behaviours.[25]

Proof of concept in the impact of design on health is emerging in several places across North America where, over the past decade, comprehensive policy change has been pursued to improve the design of communities. In New York City, the feasibility of achieving policy change has resulted in demonstrable improvements in population behaviours, including increases in commuter cycling, reduced traffic injuries and increased transit use.

New York City is also one of many areas in the U.S. that have demonstrated reductions in childhood obesity rates with the establishment of healthier schools, as well as a number of other initiatives to support walking and cycling (see Table 1).[26]

Table 1: Early Signs of Progress Toward Reversing Childhood Obesity

Location	Interventions	Results-To-Date
California	• School nutrition: removed soda and sugar-sweetened beverages; limited unhealthy snacks • Calorie labelling in chain restaurants • Technical assistance to cities to establish local measures • Local initiatives, e.g., San Fernando – creation of park with walking paths; city codes changed to allow outdoor seating and dining along sidewalks; reduced lanes and speed limit on Avenue and installed benches and trash cans	1.1% decline in childhood overweight and obesity (grades 5, 7, 9) from 38.4% to 38.0% (2005-2010)
Eastern Massachusetts	• Statewide program promoting opportunities for healthy eating and active living in schools, workplaces, child-care centers, state agencies and communities • local initiatives, e.g., Somerville – school nutrition program; school physical activity and after-school; recreation programming, including open streets; making streets safer and more accessible to bicyclists and pedestrians with new bike lanes and traffic-calming measures	21.4% decline in obesity for children under age 6 from 9.8% to 7.7% (2004-2008)
New Mexico	• Pilot program in Las Cruces • School nutrition • Use of school facilities by community • Affordable foods in every neighbourhood • Making it easier to walk and bike to schools, work, shops and other destinations	5.3% decline in obesity for children (grade 3) from 22.6% to 21.4% (2010-2012)
New York City	• Child care policies (nutrition, physical activity, screen time) • Fresh produce to neighbourhoods • Calorie posting in chain restaurants • Active design guidelines for buildings, streets and urban spaces • Expansion of bike lanes • Creation of pedestrian spaces (community plazas, open streets)	5.5% decline in obesity for grades K to 8 from 21.9% to 20.7% (2006/07-2010/11)
Philadelphia	• School nutrition: education, removed sodas and sugar-sweetened beverages; banned deep fryers; snack guidelines • Calorie posting in chain restaurants • Attracted grocers to open stores in lower-income neighbourhoods	4.7% decline in obesity for grades K to 12 from 21.5% to 20.5% (2006/07-2009/10) Note: larger declines in African-American boys and Hispanic girls

Source: Robert Wood Johnson Foundation. 2013. Declining Childhood Obesity Rates – Where Are We Seeing Signs of Progress? Available from: http://www.rwjf.org/en/about-rwjf/newsroom/features-and-articles/signs-of-progress-in-childhood-obesity.html

Evidence for the health impact of community design is growing. The U.S. Preventive Services Task Force conducted systematic reviews of environmental and policy approaches to increase physical activity by examining two levels of design changes. At a smaller scale, they looked at street-scale policies generally limited to a few blocks. A range of policy instruments (e.g., building codes, roadway design standards, environmental changes) were used to make changes such as improved street lighting, increasing street crossing safety, traffic calming and enhanced street landscaping. Their findings indicated a median improvement of 35 per cent in some aspect of physical activity. [10]

The Task Force's review also examined community-scale policies. They found that the use of design elements (e.g., proximity of residential areas to destinations, connectivity of streets and sidewalks, aesthetic and safety aspects of the physical environment), and policy instruments (e.g., zoning regulations, building codes, other governmental policies) were associated with a median improvement of 161 per cent in physical activity.[10] A more recent systematic review similarly found that street/intersection density and distance to a store had the highest association with walking.[27] Similarly, distance to a nearest transit stop and extent of 4-way intersections had the highest association with transit use.[27]

The Canadian Mortgage and Housing Corporation (CMHC) compared neighbourhood design characteristics and walking and cycling behaviour in four conventional suburban and four new urbanist* neighbourhoods.[28] Table 2 provides selected results of interest from the study. The new urbanist neighbourhoods were associated with more supportive environments for walking and cycling, and had almost twice as many destinations within 1 km compared with conventional suburban developments. Trips by walking were twice as frequent with less household automobile use.

* New Urbanist principles include: walkability; connectivity; mixed-use and diversity; mixed housing; quality architecture and urban design; traditional neighbourhood structure; increased density; green transportation; sustainability; and quality of life. Source: NewUrbanism.org. Principles of Urbanism. 2013. Available from: www.newurbanism.org/newurbanism/principles.html

Table 2: Comparison of Characteristics of Selected Canadian Neighbourhoods Related to Walkability

Characteristic	New Urbanist Neighbourhood*	Conventional Suburban Neighbourhood
Streetscapes pleasant for walking	85%	44%
Streets very safe for walking, biking	55%	37%
Very convenient to walk, bike to open space	70%	47%
Very satisfied with overall design of neighbourhood	60%	34%
Walk to local services and stores, several times a week	51%	19%
Vehicle kilometres travelled per household	37.1%	46.0%
% trips by walking	11%	5%
% trips by automobile	78%	85%
% trips by public transit	9%	9%

*New Urbanist neighbourhoods: McKenzie Towne (Calgary); Garrison Woods (Calgary); Cornell (Markham); Bois-Franc (Montréal)
**Conventional suburban neighbourhoods: McKenzie Lake (Calgary); North Signal Hill (Calgary); Woodbine North (Markham); Nouveau Saint-Laurent (Montréal)

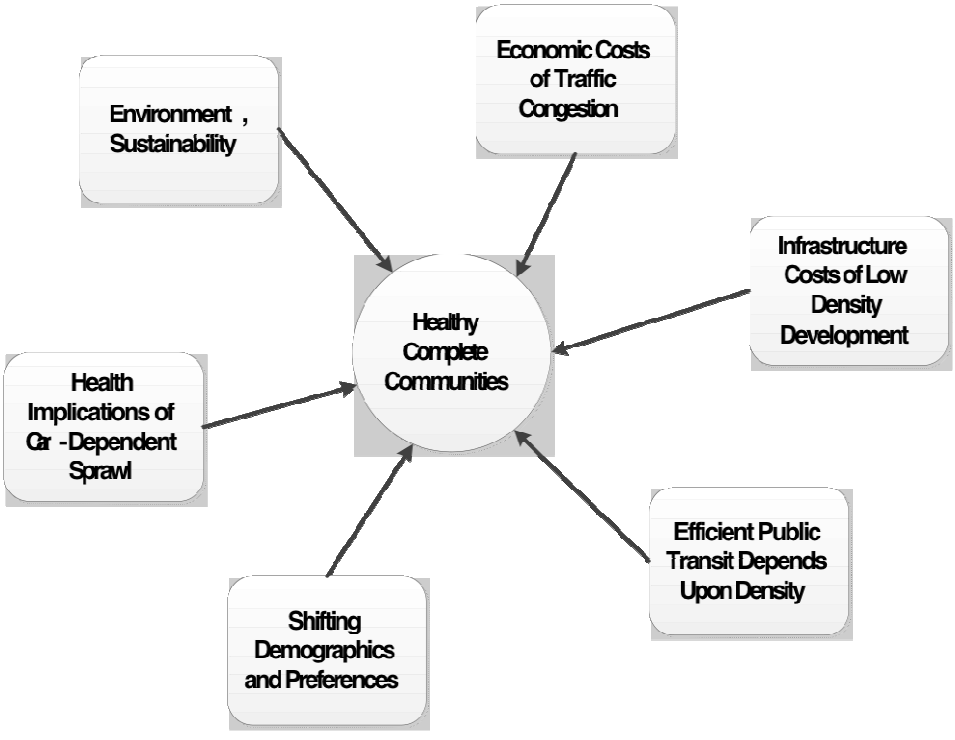
A key challenge with the CMHC study and much of the built design literature, is that the people that have chosen to live in a particular type of neighbourhood may differ in their preferences for walking and cycling compared to those choosing to live elsewhere. Studies that have statistically controlled for self-selection find a reduction in the magnitude of the observed effect of built form on travel behaviour, although it still remains statistically significant.[29] For example, a recent study from Australia examined the impact of residential relocation to fringe developments of varying built forms controlling for reasons for location choice.[30] The researchers found that in those with increased access to destinations, walking increased for each type of destination available. A key challenge with almost all of the new neighbourhoods was that non-recreational destinations were quite limited. The authors noted that public policies actively support the establishment of recreation destinations (e.g., parks, open spaces) in developments, whereas little is done to provide incentives or infrastructure levies to facilitate the early establishment of local businesses and social infrastructure.[30]

Due to the wide range of variables involved, it is not yet possible to state with precision the exact contribution of built form on physical activity and health. What is clear is that it does

contribute to the extent that people walk. Even a small behaviour change applied to a large number of people for a strong preventive intervention, such as walking and cycling, could have significant health benefits. Decisions regarding the built form are made every day that have the potential to support, discourage or be neutral towards the physical activity of residents. While unintended, the cumulative impact of past decisions has been to discourage activity and we, including our children, are paying the price. We need to shift the balance and look for every opportunity to encourage activity. Furthermore, as will be described in the next section, there are a multitude of other reasons to support the development of denser, more compact healthy complete communities. The design characteristics that support better health also contribute to the achievement of other societal goals.

Synergies with Other Initiatives

While this discussion paper is predominantly focused on selected health implications of land use and transportation planning, there is a convergence of multiple societal perspectives that are encouraging us to rethink existing practices towards designing healthy, complete communities.*



* Complete communities meet people's needs for daily living throughout an entire lifetime by providing convenient access to an appropriate mix of jobs, local services, a full range of housing, and community infrastructure, including affordable housing, schools, recreation and open space for their residents. Convenient access to public transportation and options for safe, non-motorized travel is also provided. Source: Ontario Ministry of Infrastructure. *Places to Grow – Better Choices, Brighter Future. Growth Plan for the Greater Golden Horseshoe.* Toronto, 2006.

From an environmental and sustainability perspective, more complete communities offer reduced pollution, reduced energy consumption, and protection of greenspace and habitats. While climate change is a global problem, local solutions are critical. Accordingly, many municipalities are adopting sustainability guidelines (see text box) and the Region, area municipalities and conservation authorities have prepared a Climate Change Strategy. Compared with typical suburban development, healthy complete communities offer significant reductions in energy expenditure and greenhouse gas emissions predominantly by reducing car use through walking, cycling and public transit.[31] For example, a Toronto-based study comparing inner-city and suburban neighbourhoods estimated greenhouse gas emissions that were 2.6 times less in the inner-city on a per capita basis.[32]

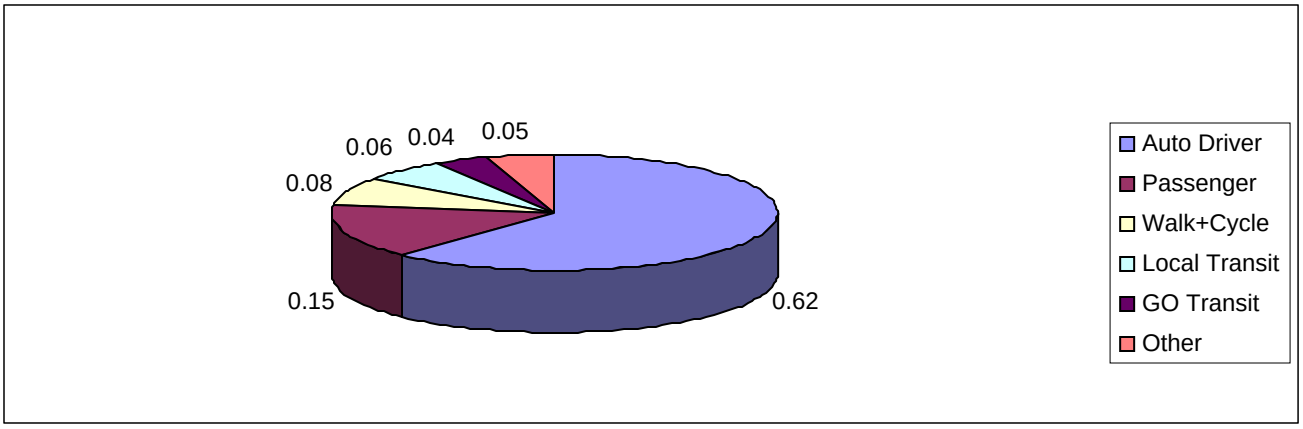
Recent Examples of Sustainability Guidelines in Ontario

- Brampton Sustainable Community Development Guidelines
- East Gwillimbury: Thinking Green! Development Standards
- Markham: Green Print
- Pickering: Seaton Sustainable Place-Making Guidelines
- York Region: New Communities Guidelines
- Toronto: Green Development Standards

A reliance on cars for transportation has led to ever-worsening congestion on our roads and highways. The annual cost of congestion to commuters in the Greater Toronto and Hamilton Area (GTHA) in 2006 was $3.3 billion with a further $2.7 billion cost in lost opportunities for economic expansion.[33] These costs will more than double over the next 25 years if congestion remains unattended.

As of 2006, the transportation modal split in Peel for the morning peak period demonstrates the dominance of automobiles, with over three-quarters of individuals driving or being a passenger (see Figure 7). Public transit and active transportation accounted for 9.5 per cent and 7.6 per cent of morning peak period trips, respectively. While public transit modal share had increased slightly over the preceding decade from 9.1 to 9.5 per cent, active transportation had decreased from a level of 8.4 per cent in 1996.

Figure 7: Primary Mode of Travel, AM Peak Period, Peel Region, 2006



Source: University of Toronto Data Management Group. 2006 Travel Survey Summary for the Transportation Tomorrow Survey Area. 2008. Available from: http://www.dmg.utoronto.ca/pdf/tts/2006/regional_travel_summaries/Peel.pdf

The **Peel Long Range Transportation Plan – Update 2012 indicates that widening existing roads and building new ones will be insufficient to meet future growth in travel demand**. While it is anticipated that greater car pooling will contribute to reduced demand, substantial increases in mode share for public transit and active transportation will be required to avoid congestion, which will reach critical levels. Efficient transit use requires denser, more compact communities. As noted by Metrolinx, "an effective transportation system is one that is supported by, and that promotes efficient and sustainable land use."[34] As such, key planning characteristics of Metrolinx's work involves a system of connected mobility hubs that provide travellers with access to the system and support high density development.

Reflecting on a society's car-dependent perspective, the investment in public transit receives considerable media and political attention, yet the public taxpayer cost of widening roads and building highways is given much less attention. For example, widening a two-lane rural road to a four-lane urban road is estimated to cost $4.8 million per kilometre, not including the cost of property acquisition for right of way, intersection costs or bus bays.[*] Provincial investment in expanding and repairing southern Ontario highways and bridges, most of which are located in the GTHA, amounted to $1.36 billion in 2011 and $1.87 billion in 2012.[35] To avoid gridlock, we need roads and highways, as well as public transit. However, we have historically treated investment of the former as a given, and the latter as an extra. **We have tended to think in terms of the cost of public transit and the investment in roads.**

While the average travel distance to work for Peel residents is almost 15 km, about half (46 per cent) of work and school trips made in 2006 were shorter than 5 km. Overall, many trips throughout the day are within distances that could be viable by walking (2 km or less) or cycling

[*] Transportation Division, Public Works, Region of Peel.

(7 km or less). However, these modes of active transportation are being under-utilized currently with the majority of such trips occurring by automobile (see Table 3). Based on the proportion of automobiles used for short trips (as per Table 3), increasing active transportation for short trips will be a key approach to addressing congestion in Peel in the next two decades. However, the design of communities also needs to support a shift to active transportation.

Table 3: Use of Active Transportation for Daily Trips in Peel Region, 2006

Distance	Proportion of all daily trips	Proportion walk	Proportion cycle	Proportion transit	Proportion automobile
Potentially walk (2 km or less)	18%	23%	1%	2%	72%
Potentially cycle (7 km or less)	53%	9%	1%	5%	81%

Source: University of Toronto Data Management Group. 2006 Travel Survey Summary for the Transportation Tomorrow Survey Area. 2008. Available from: http://www.dmg.utoronto.ca/pdf/tts/2006/regional_travel_summaries/Peel.pdf

The cost implications of historical development patterns are substantial to municipalities and their taxpayers. Less dense suburban development has higher costs to develop, and maintain an inefficient infrastructure that guarantees higher taxes in perpetuity. A recent summary of case studies from across the U.S. found that compared with traditional suburban growth, more compact development saved an average of 38 per cent on upfront infrastructure costs, saved 10 per cent on ongoing delivery of services, and generated 10 times more tax revenue per acre.[36] These findings are consistent with analysis from Calgary, which demonstrated more compact development would be 33 per cent less expensive to build than if the city were to continue to grow if following existing patterns.[37] The single largest contributor to the difference was road capital costs, followed by water and wastewater and schools. Annual operating costs were 14 per cent less for the more compact option.

Benefits to Municipal Budgets with More Compact Development

- Save 38 per cent on upfront infrastructure costs
- Save 10 per cent on ongoing delivery of services
- Generate 10 times more tax revenue per acre

Shifts in perspectives are also occurring regarding the desired form of neighbourhoods. In a survey of Greater Toronto Area (GTA) residents, 13 per cent currently living in more automobile friendly neighbourhoods indicated that they would prefer to live in a pedestrian/transit friendly neighbourhood.[38] Conversely, only 4.6 per cent of those living in pedestrian/transit friendly neighbourhoods would prefer to live in a more automobile friendly neighbourhood. Survey data from the U.S. also indicates that the majority (56 per cent) of adults nationwide would prefer living in a smart growth community, rather than a sprawl community; primarily because of the convenience of being within walking distance to shops and restaurants.[39] **The potential to**

reduce car-associated expenditures, such as shifting from two cars to a single car, results in additional cost savings, since annual costs of car ownership range from $8,700 to $11,800, depending upon car class.[40]

Summary

Fostering a healthier public is one of several reasons for seeking healthy, complete communities. While optimizing the public's health is an intrinsic good, achieving this goal also has major implications for the sustainability of our healthcare system, as well as the prosperity of our economy. Increasing walking and cycling in the population offers tremendous potential for health improvement. However, the desirability, feasibility and safety of these active transportation modes are dependent upon community designs that are markedly different from historical patterns.

> Many communities are, to various degrees, automobile dependent, meaning that their transport systems and land use patterns favour automobile access and provide relatively poor access by other modes. The alternative is generally not a car-free community where driving is forbidden, rather, it is a community with a diverse (or multi-modal) transport system, which provides various accessibility options, including good walking, cycling, public transit, automobile, taxi, telework and delivery services.
>
> Source: Litman. Evaluating non-motorized transportation benefits and costs. Victoria Transport Policy Institute. 2012.

CREATING SUPPORTIVE ENVIRONMENTS FOR HEALTH IN PEEL

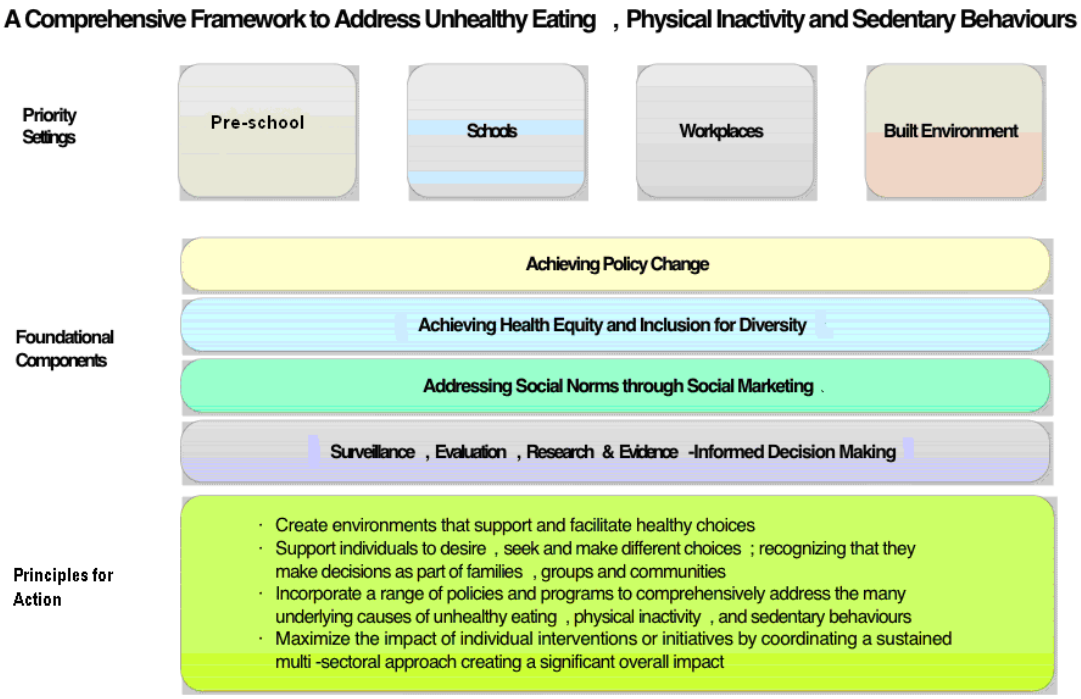
As previously noted, as the Region's public health unit, Peel Public Health is mandated by the *Ontario Public Health Standards*[2] to assess and report on the state of, and factors affecting, the health of the public, as well as to work with municipalities to support healthy public policies to create supportive environments in the built environment.

With increasing recognition of the problem, Peel Regional Council, as the Board of Health, has identified creating supportive environments for healthy living as a Term of Council priority, and Peel Public Health has identified policy change as central to its Changing Course strategy.[41] We have made progress in improving the understanding of the design impacts on health and in creating tools to support health-based assessment of development plans. Several Regional and area municipality resolutions have supported the application of these tools for the health-based analysis of plans. The purpose of this section is to describe key aspects of this work with specific attention on the development of land use criteria to support health for assessing development applications and in the preparation of plans and guides.

Changing Course Strategy

The Changing Course Strategy provides a comprehensive framework to address unhealthy eating, physical inactivity and sedentary behaviours with a focus on their underlying causes (see Figure 8).

Figure 8: The Changing Course Strategy



Source: Peel Public Health. Changing Course: Creating Supportive Environments for Healthy Living in Peel. 2012.

The preparation of this discussion paper and its aim to seek changes to the Regional Official Plan along with supportive changes at provincial and national/federal levels align with key features of the above strategy:

- A focus on the built environment as a priority setting
- The achievement of policy change as a foundational component
- Creating environments that support and facilitate healthy choices

To support learning from others, the Region of Peel has partnered with the New York City (NYC) Center for Active Design to leverage their expertise and experience for the benefit of Peel's residents. The Healthy Peel by Design Symposium was held in October 2012 and it provided an opportunity for Regional and Municipal senior management and Councillors, staff from a range of Regional and Municipal departments, and community partners to learn of NYC's initiatives in creating a healthier city through design.[*] Symposium workshops have led to a series of interdepartmental working groups to pursue specific short- and longer-term improvements in Peel's built environment (see Appendix A for more information).

[*] Healthy Peel by Design Symposium. Available at: peelregion.ca/health/resources/healthbydesign/pdf/hbd-workshop-summ-report-oct19-2012.pdf

Tool Development to Support Health-Informed Assessments

As the extent of the health challenge became apparent, Council provided direction to "study and make recommendations for planning policies and processes that provide greater opportunities for active living" (Resolution 2005-1395). This strategy is highly consistent with existing evidence-based recommendations to promote and create built environments that encourage and support physical activity emphasizing the role of planning (see text box).

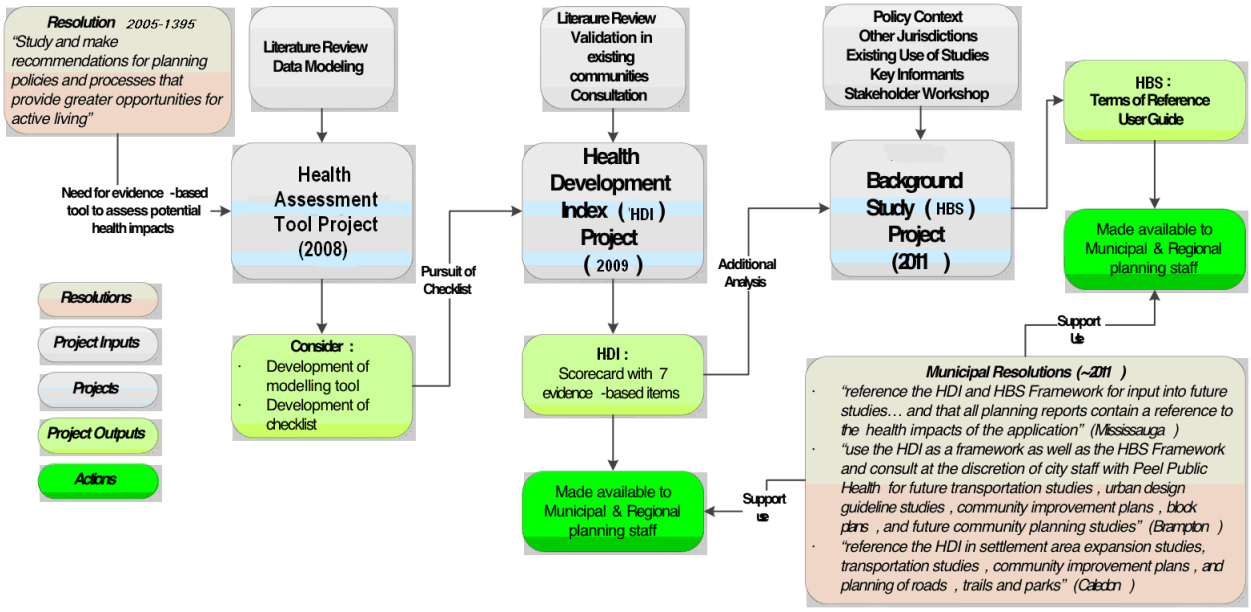
Recommendations to Promoting and Creating Built or Natural Environments that Encourage and Support Physical Activity

Strategies, policies and plans should involve local communities and experts at all stages of development. Planning applications should prioritize people to be physically active and include an assessment in advance of the impact of development proposals on physical activity.

Source: National Institute for Health and Clinical Excellence, London, 2008.

The need for an evidence-based tool to assess potential health impacts of planning decisions was identified as a priority. Over a series of projects, which involved reviewing the evidence on the relationships between the built form and health and consulting with key stakeholders, a comprehensive Health Background Study (HBS) Framework was developed. Figure 9 summarizes the key projects and resolutions that have been part of this process of learning and application.

Figure 9: Development of Health-Based Planning Tool Development and Enabling Regional/Municipal Resolutions

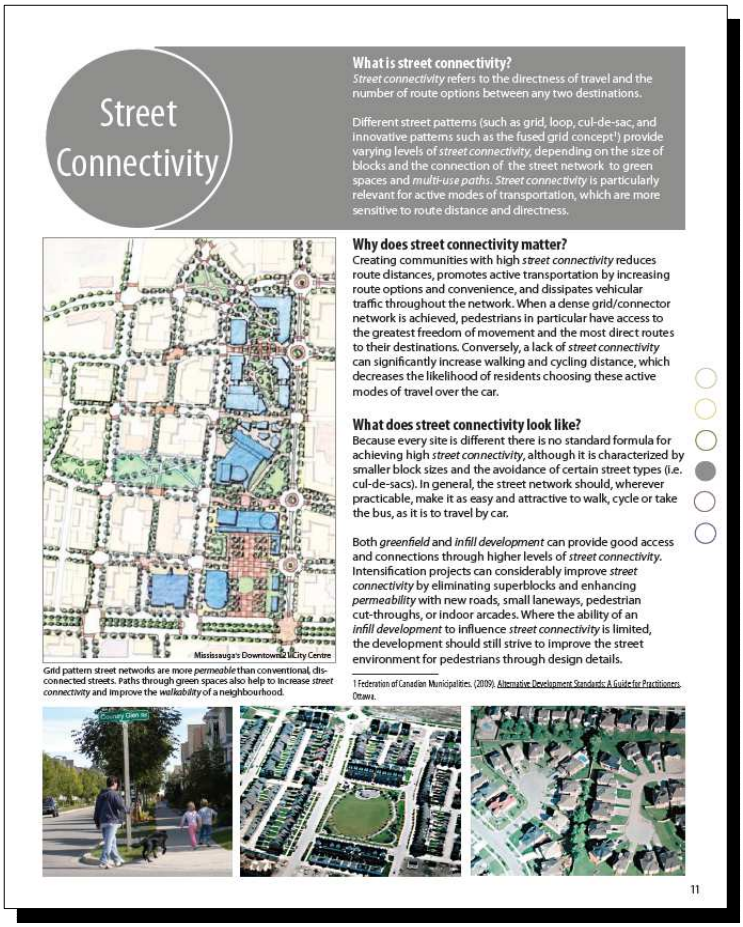


The HBS Framework is comprised of a terms of reference (Appendix C) and user guide focussing on the following evidence-based elements:

HBS Element	What does it look like?	Why does it matter?
Density	• Reduced lot sizes, frontages and setbacks • Efficient lot configuration • Increased site coverage and buildings • Mix of higher-density structure types (stacked row houses, multiplexes, apartment buildings etc.) • Reducing parking supply and introduction of structured on-street parking • Compact street networks	• Higher density creates demand and support for a broader variety of services, employment opportunities, transit and other community destinations/facilities within a closer distance and creates opportunities for active transportation
Service Proximity	• Achieve a reasonable cluster of key services and employment opportunities to residents and transportation nodes, based on walking distance • Set maximum walking distances to ensure high incentive to walk – distances set based on shortest potential walking path of a pedestrian	• Affects the travel distance between daily destinations (home and work) and influences choices to walk or bicycle, rather than drive a car • Makes the community more equitable and inclusive for those who cannot drive
Land Use Mix	• Standards compliment service proximity and density to promote a broad mix of land uses that are conveniently sited and connected by safe and comfortable routes to residential areas that provide a variety of housing options	• Providing a range of housing creates more equitable communities • Allows residents to remain within their community regardless of their changing needs (live alone, as a couple, a family, with or without children, or as a seniors) • Providing a mix of land uses facilitates walking and cycling as viable modes of transportation, supports compact and efficient urban form, and creates the necessary demand to support public transit
Street Connectivity	• Characterized by smaller block sizes and the avoidance of certain street types (i.e., cul-de-sacs) • Well connected street network should make it as easy and attractive to walk, cycle or take the bus, as it is to travel by car	• Creating communities with high street connectivity reduces route distances, promotes active transportation by increasing route options and convenience, and dissipates vehicular traffic throughout the network • A dense grid/connectors network provides the greatest freedom of movement and the most direct routes to destinations

Streetscape Characteristics	• Includes facilities for pedestrians, cyclists and transit users along the public right of way, such as sidewalks, bikeways, street furniture, intersection treatments, shading, lighting, wayfinding and traffic calming measures	• Well-designed streetscape improves the safety, comfort and convenience of traveling by foot or bike and makes public spaces more inviting • The streetscape can promoted increased physical activity, community interaction and accessibility, while reducing the incidence of crime and traffic-related pedestrian and cycling injuries and fatalities
Parking	• Seek to reduce the supply of car parking while increasing the supply of bicycle parking • Make more efficient use of car parking (e.g. shared parking spaces, preferential parking for carpools) and reduce the environmental and aesthetic impacts of large surface parking lots/structures	• Objective of parking standard is to discourage private automobile use and promote active modes of transportation including walking, bicycling and public transit • Automobile parking is an important amenity, but it can have a negative effect on proximity, density and the aesthetic of the public realm • Providing bicycle parking with an appropriate level of weather-protection and security is a key part of promoting cycling for transportation

For each element, the user guide provides a description of the element, a rationale, examples, standards, and a set of key questions. The content for street connectivity is shown to the right.



While these design characteristics are supportive of better health, they are not unique to health, but overlap considerably with recommendations for good urban design and sustainability.

The HBS Framework was made available to Municipal and Regional planning staff, and their use was supported through a series of municipal resolutions.

The HBS is supported by individual resolutions in each municipality, as such its use has been customized within each of the area municipalities. Currently, planning staff within each municipality, in consultation with public health staff, may apply the HBS Framework to a particular

development application. Choosing which components of the HBS Framework to apply depends upon the nature of the development.

Viewed from where things stood as of 2005, progress has been achieved in the development of health-based assessment tools and their application in particular circumstances. However, the current discretionary application of health-based criteria is not consistent with the pervasive nature of the challenges associated with historical approaches to built form. Walkability and cyclability should be pertinent considerations for any development. The lack of consequences for non-compliance also means that there are only soft levers for ensuring consideration of the HBS.

THE HEALTH AND PLANNING POLICY CONTINUUM

Region of Peel

Official Plan

The Regional Official Plan provides Council with a long-term strategic policy framework for guiding growth and development in Peel while having regard for protecting the environment, managing the renewable and non-renewable resources, and outlining a regional structure that manages growth within Peel in the most efficient manner. It also facilitates the interpretation and applies the intent of provincial legislation and policies within a Regional context. As required by the *Planning Act*, a municipality is to revise its Official Plan every five years to ensure that it conforms to provincial plans, takes into account matters of provincial interest and is consistent with policy statements issued under the Act.

The most relevant Official Plan Amendments with respect to the application of health-based criteria to the planning process include the following:

Document	Policy #	Intent
Amendment 24 ***APPROVED***	7.9.2.9	The Region will prepare an assessment tool to evaluate the public health impacts of development, jointly with the area municipalities.
	7.9.2.10	The Region will work jointly with the area municipalities to raise public awareness of the health impacts related to planning through public and private partnerships.
Amendment 25 ***APPROVED***	7.3.6.2.2	The Region may require health impact studies as part of a complete development application to amend the Regional Official Plan.
	7.9.2.3	The Region may develop public health indicators to analyze the effectiveness of Official Plan policies and serve as a basis for policy adjustments.

Studies and Plans

It is beyond the scope of this discussion paper to highlight all of the many Regional studies and plans that are relevant to health and built environment. However, a few will be highlighted here to illustrate the link between health and built environment everywhere:

- Road Characterization Study (2013)
    - Re-examined approach to right-of-way design that previously focused primarily on motorists' safety
    - Developed new access by-law that aligns with the Road Character Types and allows for more compact, walkable and dense development as places evolve
    - Instead of one type of regional road or a one size fits all approach, the study developed with stakeholders six different types of roads that provide a more diverse toolbox for community design
- Long Range Transportation Plan (2012 Update)
    - Several transportation challenges identified, included growing road congestion, limited opportunities to provide more road capacity, worsening air quality/global warming and excessive dependence on the automobile
    - Improvements in the number and width of roads cannot keep pace with demand resulting in greater congestion
    - Among daily short trips, infrequent walking or cycling (active transportation modes) are under-utilized
        - Analysis of alternatives indicates a need to combine road and highway improvement with transportation demand management (carpooling, incentives to ride transit, encourage walking and cycling, and promote flexible work hours).
- Active Transportation Plan (2011)
    - Provides additional detail on the potential for active transportation for short trips
        - Feasibility of active transportation is dependent upon density, mixed land use and connectivity – for activity to be utilitarian there needs to be a destination to walk or cycle to. Several recommendations address creating active transportation-friendly developments and communities (see Appendix B).

        - A commuter attitudes survey indicates a number of significant challenges, including safety concerns, lack of walking/cycling infrastructure, general lack of interest in active transportation and perceived time/distance constraints.
        - Efforts beyond improving active transportation infrastructure are needed to make people choose to shift out of their cars and onto their feet or bicycles.
- Affordable Housing Active Design Guidelines (in progress)
    - Regional involvement in funding the development and management of affordable housing provides an opportunity to apply principles for active design to make these settings as healthy as possible
    - While development of these guidelines is at an early stage, the types of issues receiving early consideration include access to transit, the design of play areas, and proximity to retail and other services

These examples illustrate how key concepts supportive of complete communities are permeating regional guidelines. However, because the concepts are dispersed and inter-dependent, there is value in the HBS identifying and considering such concepts in an explicit and comprehensive manner.

Municipalities

Official Plans

Area municipalities have recently updated their official plan policies to include stronger language that supports the application of health based criteria in planning processes. The policy amendments are identified in the table below.

Caledon Official Plan Amendment 226	4.1.10.3.2	"Caledon will participate jointly with the Region of Peel and area municipalities in the preparation of an assessment tool for evaluating the public health impacts of development proposals."
	4.1.10.3.3	"Caledon will work jointly with the Region of Peel and area municipalities to raise awareness of public health issues related to planning."

Mississauga draft Official Plan	19.3.5	"Some or all of the following studies, reports and/or documents may be required as part of a complete application submission for an official plan amendment, rezoning, draft plan of subdivision or condominium or consent application, dependent on the type of application, the property location and adequacy of services:… • Health Impact Study…"
	19.3.7	"To provide consistent, efficient, and predictable application of environmental planning principles, all applications will have regard for:... m. public health."
Brampton Official Plan Amendment 43	4.10.4.7(xiv)	Section 4.10.4.7 states: "When utilizing the implementation tools stated in Section 4.10.4.3, all development and redevelopment will be subject to the consideration of the following elements:…" Hence 4.10.4.7 was amended to include the following subsection: "(xiv) **Public Health:** How the design and use of the physical development positively contribute to human health."
	5.31.3	Section 5.31.3 states: "Unless an exemption is granted by the Commissioner under policy 5.31.6, the following information and material shall be required to be submitted as part of any application for an Official Plan amendment, zoning by-law amendment, draft plan of subdivision, and draft plan of condominium and shall be requested as applicable for other applications:" Hence 5.31.3 was amended to include the following to the end of the bullet list: • "Health Impact Study"
	5.32.2	Section 5.32.2 states: "An impact study may relate to, but is not limited to, an assessment of one or more of the following matters: any physical, social, economic or environmental consideration such as transportation network, environmental function, sun shadowing, wind, micro and/or macroclimate, noise, recreation opportunities, heritage resources, services or infrastructure and financial considerations." Hence Section 5.32.2 was amended to include "public health impacts" to the above list of assessments.

The Mississauga and Brampton official plans contain the most explicit wording although it varies somewhat by statement (e.g., “may require,” “requires all,” “be subject to,” “shall consider”).

Studies, Plans and By-laws

A range of relevant studies, plans and by-laws have been produced by municipalities. An example from each municipality is provided below:

- Caledon Drive-Through By-Law:
    - In August 2012, a resolution was passed regarding Drive-through service facilities in the Town of Caledon (i.e., Proposed Official Plan Amendment (OPA) 204 and draft Zoning By-law Amendment)
    - The intent is to strengthen existing Town policies regarding drive-through service by identifying locations where they may be permitted and by addressing issues related to their development either as stand-alone use or in combination with other uses
    - The potential negative impacts of drive-through services include:
        - reduced air quality as a result of idling
        - impact to pedestrian character
        - promotion of sedentary lifestyle
        - impact on nearby sensitive land uses (i.e., residences)
- Brampton Sustainable Community Development Guidelines:
    - Focuses on secondary plans, block plans, subdivision and site plans
    - Addresses compact development, walkability, street network, active transportation and transit supportive design by incorporating public health (HBS elements) in consideration of built environment at each planning level; also includes consideration of mobility, natural environment and open space, and green infrastructure and building
    - Developing performance measures in collaboration with Vaughan and Richmond Hill
- Mississauga’s Cycling Master Plan and Implementation Strategy
    - A strategy to develop over 900 kilometres of on and off-road cycling routes in the city over the next 20 years

- The plan focuses on fostering cycling as a way of life in the city, building an integrated network of cycling routes, and aims to adopt a safety first approach to cycling
- When fully implemented, the plan will provide an integrated multi-modal approach to transportation throughout the city, connecting destinations and placing 95 per cent of the city's population within 1 kilometre of a primary cycling route

National Initiatives

Transportation Association of Canada

The Transportation Association of Canada (TAC) produces a series of technical guidelines that are used extensively by transportation planners. TAC is currently planning an update to the 1999 version of the Geometric Design Guide for Canadian Roads, which is the principal geometric design reference source in Canada. While reviewed predominantly from a safety and engineering perspective, TAC is interested in seeking greater understanding of the relationship of planning issues with chronic diseases. As a result, management staff from Peel Public Health and Regional Transportation Planning are members of the standing committee to review the guidelines.

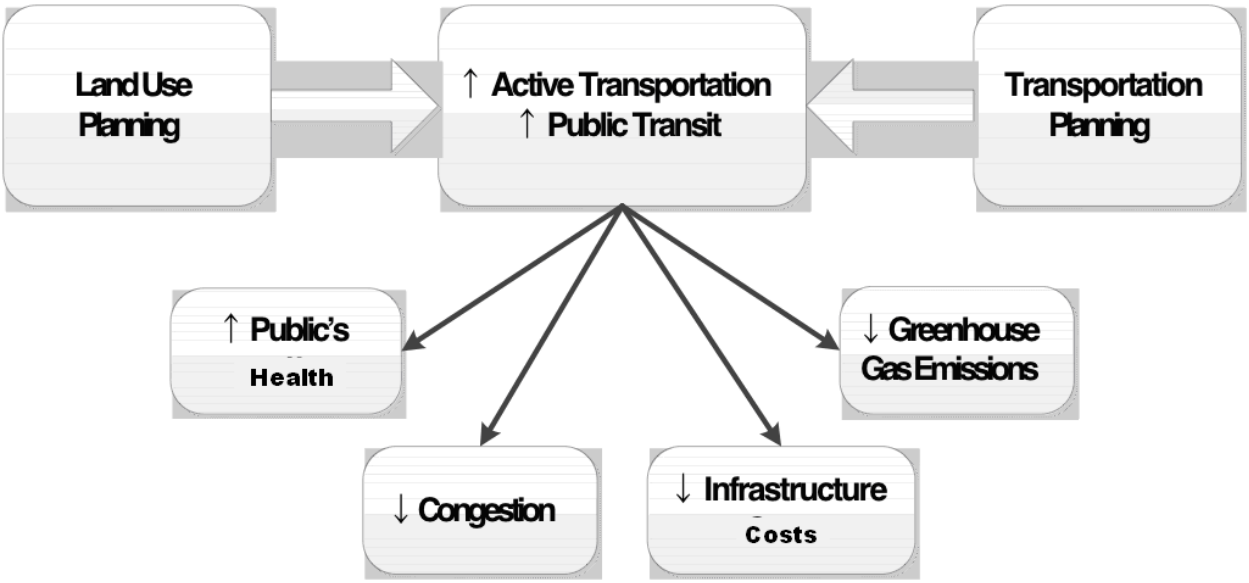
ANALYSIS AND RECOMMENDATIONS

The Problem

There is a major and pervasive problem with how our communities are designed. The consequences include:

- Worsening traffic congestion with massive adverse effects on economic productivity, air quality, climate change, stress and sedentariness
- A built form that guarantees more expensive infrastructure costs; therefore, increasing municipal taxes forever
- A built form that impedes active transportation, which is the most effective means for most people to be physically active. The consequences are rates of obesity, diabetes and chronic diseases that will increasingly impede our level of health, prosperity and healthcare system sustainability
- A built form that does not support the efficient use of public transit, which is the obvious solution to traffic congestion and would support active transportation

The status quo is neither health supporting or sustainable. Continuing the historical patterns of development will add more personal vehicles that our roads cannot accommodate, will not support public transit and will not enable active transportation. **We cannot expect to meaningfully prevent diabetes and other chronic diseases unless physical activity is built into people's everyday lives.** There needs to be a shift in transportation modes towards active transportation and public transit. This needs to be supported at every planning level in order to normalize the asking of how designs support these two goals.



We need to adjust the balance between cars and trucks on the one hand, and bikes, pedestrians and transit users on the other. Considering projected demands in transportation due to population growth, this shift **must** happen in order to keep people and goods moving in Peel. Since relatively small amounts of walking and cycling, such as 30 minutes a day, can have large impacts on people's health, such a shift will have significant health benefits. However, creating an environment where walking and cycling are a normal part of everyday life represents a fundamental change in community design.

Simply adding a sidewalk or bicycle lane on an arterial road is not the answer since the fundamental design requirements for active transportation have not been addressed, such as safety and destination based walking routes. Furthermore, considering traffic characteristics on busier roads and truck routes, it would be unethical from a safety perspective to widely promote active transportation in such settings at the current time. Risks of active transportation are not absolute. Countries with better walking and cycling infrastructure, such as Germany and the Netherlands, have substantially lower cyclist injury rates.[45]

For multiple reasons, a shifting in mode of transportation is critical to the health and financial well-being of Peel residents. It is the right thing to do and needs to be universally considered. For any development, we automatically consider access to utilities and roads. We do not qualify access to clean drinking water based on whether we perceive it is affordable. Likewise, we need to normalize to ask ourselves, every time we plan, how this development will contribute to walking, cycling and transit use.

The Public Health Role

Concern for the health of Peel's residents has resulted in Peel Public Health's increasing involvement in the discussion and analysis of achieving complete communities. Early actions by public health leaders over a hundred years ago actively supported changes in the way communities were designed ensuring access to clean drinking water, sewage systems, fresh air and sunlight. These policies, novel at the time, have become ingrained in how we design communities and have had lasting positive impact on people's health.

In order to have significant impact on the public's health, we are again faced with major health challenges that demand change to the way we design communities. As the Region's public health unit, we have the following key roles:

1. To sound the alarm as an independent voice addressing the health of the public.
2. To support and defend decisions supportive of the public's health.
3. To contribute to strategy and policy development.

Despite the convergence of multiple perspectives, many challenges exist to achieving the vision for healthy, complete communities. More urgent action is required to positively impact the health of Peel's residents.

Regional Planning Policies

The previously approved amendments (ROPA 24 and 25) to the Regional Official Plan include the following:

APPROVED AMENDMENTS 24 AND 25	
Policy #	**Intent**
7.3.6.2.2	The Region may require health impact studies as part of a complete development application to amend the Regional Official Plan.
7.9.2.3	The Region may develop public health indicators to analyze the effectiveness of Official Plan policies and serve as a basis for policy adjustments.
7.9.2.9	The Region will prepare an assessment tool to evaluate the public health impacts of development, jointly with the area municipalities.
7.9.2.10	The Region will work jointly with the area municipalities to raise public awareness of the health impacts related to planning through public and private partnerships.

These amendments were important to signal an increasing focus for health-related elements of development and to enable the use of health impact studies. However, through implementation, health, regional and municipal planning staff have recognized opportunities that can be further leveraged and limitations that should be addressed. Both matters can be addressed through this Official Plan review process. For example, municipal staff have asked for stronger support from health to facilitate mixed land use and compact development in incoming development applications. In doing so, health and planners work together to meet the shared goals of the municipalities and of public health, such as compact design and relevant policies in official plans, master plans or design guidelines. Furthermore, public health is available to assist in defending these parallel goals because the Healthy Development Index (HDI) is based on scientific evidence and is therefore defendable from a scientific research perspective. The proposed amendments simply allow public health to strengthen their position in support of municipalities on shared goals, while also ensuring consistent application, specificity in requirements and support for municipalities to be locally responsive in their decision-making.

For the purpose of consultation with regional staff, area municipalities and key stakeholders, this discussion paper proposes amendments to the Regional Official Plan in order to:

- Incorporate the evaluation of built environment characteristics supporting health into the development approval process and the planning, policy, infrastructure provision and civic development activities of the Region and area municipalities

- Enable the requirement of health background studies from applicants as part of the development approval process

- Provide consistency on the use of health background studies in the development approval process by indicating:
    - under what circumstances a health background study is required and at what stage in the development approval process; and
    - what a health background study is to include.

- Encourage the use of the principles established in the HDI (December 2009), HBS Framework (May 27, 2011) and Healthy Development Index Refinement Study (October 12, 2011) in guiding region- and area municipality-led planning initiatives, as well as civic development and infrastructure projects

- Ensure that the ROP as a whole supports the standards established in the terms of reference for health background studies

- Ensure that the official plans of area municipalities support the standards established in the terms of reference for health background studies

Proposed Regional Official Plan Policy Amendments*

Chapter 7: Implementation	
7.3 The Planning Process	
7.3.6.2.2	Replace "public health impact studies" with "health background study"
7.4 Healthy Communities and the Built Environment (a new section after 7.3 and before current 7.4)	
Introduction	The Region of Peel is committed to creating healthy communities. The characteristics of our built environment have an impact on levels of physical activity and therefore health outcomes. One important way of increasing physical activity is to enable and encourage people to incorporate it into their everyday lives through active transportation. In partnership with area municipalities, the Region will incorporate health considerations into the planning and development review process through the requirement for a health background study.
7.4.1	Objective To create supportive built environments that facilitate physical activity and maximize the health promoting potential of communities.
7.4.2	Policies It is the policy of Regional Council to:
7.4.2.1	Endorse terms of reference for health background studies that support the implementation of the policies of this plan by providing standards for the evaluation of development based on built environment characteristics supportive of active transportation.
7.4.2.2	Direct area municipalities to require a health background study as part of a complete application to amend an area municipal official plan or zoning by-law, to approve a plan of subdivision or condominium or to support the consideration of plans and drawings during the site plan control process. In part fulfillment of this requirement, the development proponent will: • consult with area municipal and regional staff during the pre-application stage to identify the healthy development standards to be assessed in the health background study, and

* These draft policy amendments are as of November 7, 2013. Revisions will continue to be made after this date due to comments received from the workshop and other consultations (e.g., Province, area municipalities, public)

	• submit a final health background study for the review of area municipal and regional staff. Regional staff will review health background studies and provide comment to the area municipal council.
7.4.2.3	Direct area municipalities to incorporate policies in their official plans that are supportive of the standards included in the health background study terms of reference.
7.4.2.4	Direct area municipalities to prepare assessments of proposed secondary plans, block plans, community improvement plans and design guidelines based on the standards included in the health background study terms of reference in order to ensure that opportunities to realize built environment characteristics supportive of healthy communities are maximized.
7.4.2.5	Ensure regional standards, policies and plans are consistent with the standards included in the health background study terms of reference, and direct area municipalities to carry out a similar compliance exercise for their standards, policies, plans and by-laws.
7.4.2.6	Apply the standards included in the health background study terms of reference in the assessment of civic development and infrastructure projects, and direct area municipalities to carry out similar assessments for local civic development and infrastructure projects.
7.4.2.7	Encourage area municipalities to apply funds from development charges to the financing of infrastructure needs identified through the health background study process.
7.9 Performance Measurement, Reviewing and Updating	
7.9.2.9	~~Prepare, jointly with the area municipalities, an assessment tool that will allow evaluating the public health impacts of proposed plans or development as part of the approval process.~~
Glossary	
health background study	Add a new definition: **Health Background Study*:*** an assessment that evaluates the extent to which a proposed development contributes to a built environment that encourages and enables physical activity through opportunities for active transportation.

Implementation Considerations

The proposed Regional Official Plan amendment aims to bring consideration of built environment characteristics supportive of health into both:

- the development approval process; and
- the planning, policy, infrastructure provision and civic development activities of Regional staff and area municipalities.

The implementation considerations for each are discussed separately below.

Planning Approval Process:

a. Finalizing the Terms of Reference

A health background study will assess a proposal against a set of standards established in the health background study terms of reference. Terms of reference will provide guidance on:

- when a health background study is required;
- what standards are to be considered given the specific nature of the project (e.g., scale, intensification/reenfield) and at what points in the development approval process (e.g., OP and zoning by-law amendments, plan of subdivision, site plan control); and
- the format of the study to be submitted as part of a complete application.

One goal of the Regional official Plan amendment process is that the health background study requirement be widely applied in the development approval process in a consistent way. Clear, easy-to-use terms of reference will be essential in realizing this goal.

Draft terms of reference are currently included in the Health Background Study (HBS) Framework. At present, these terms of reference and the Healthy Development Index are being used by regional and area municipal staff to determine the requirements for public health impact studies (as currently enabled by the ROP) with respect to a select number of developments. Because staff are currently piloting the requirement for these kinds of studies, determining what criteria and standards apply to which developments and at which stage in the development approval process requires a great deal of interpretation on the part of staff.

It is likely that the draft terms of reference included in the HBS Framework will require revision to improve clarity, consistency and usability. The initial experiences with the public health impact study requirement discussed above will be useful in evaluating the health background study draft terms of reference as they currently exist and how they might be improved.

b. Considering the Potential Burden on Staff and Developers

The preparation and evaluation of health background studies will place demands on the resources of both staff (time) and developers (time, money). Terms of reference will help determine the exact nature of this requirement. The goal in finalizing the terms of reference should be to achieve the objectives of fostering built environment characteristics supportive of health in the most efficient manner possible, without needlessly burdening developers or staff. For example, the terms of reference might include thresholds related to scale of development

that determine when a full study is required and when a faster and easier-to-complete assessment, like a checklist, might be substituted.

There is value in allowing for the interpretation by staff in determining the exact nature of the health background study. They can tailor the requirement to the specific conditions of the development proposal. However, terms of reference should be clear and easy to use and offer a level of predictability to developers so they understand what will be required of them in advance of their application.

c. Training Staff

The best way to ensure consistency in the application of the health background study requirement is to put clear terms of reference and accompanying guidance in the hands of well-trained front-line staff charged with implementation. It is important for staff to understand the context and objectives for doing health background studies and the principles behind the standards. They need to know what their role is in effective implementation. All staff at the regional and area municipal levels charged with using the health background study terms of reference should be trained in their use.

d. Reinforcing the Status of the Terms of Reference

While work on health and the built environment by Regional staff has been broadly endorsed by Regional Council, the draft terms of reference has not yet been specifically endorsed as a means for implementing the policies of the Regional Official Plan. Once the terms of reference and accompanying guidance are finalized, the endorsement of Regional Council will be an important step in linking them to the statutory authority of the Regional Official Plan and improving their defensibility should they be challenged by development proponents.

It will greatly strengthen the status of the health background study if area municipalities also include it as a requirement for a complete application in their official plans and likewise endorse the terms of reference as guidance in the implementation of official plan policies.

It is worth reemphasizing this point: the contents of a health background study will be evaluated based on standards established in the terms of reference. These terms of reference only are significant in the development review process because they serve as guidance on the implementation of the Regional Official Plan and official plan policies, policies within statutory documents. Without this link to statutory authority, the standards serve merely as suggestions to developers, rather than considerations to justify the approval or refusal of a development application.

e. Aligning Regional Official Plan and Official Plan Policies

Further to the previous point, the policies of the Regional Official Plan and area municipal official plans are the foundation for the authority of the standards included in the terms of reference. These should be reviewed and amended to support the standards and to promote healthy community principles in general.

2. Standards for Regional and Area Municipal Activities:

The points above have focused primarily on the means to require a health background study to support private-sector development. However, in addition to evaluating development proposals, the intent of the Region is also to hold its own activities and the activities of area municipalities to health-supporting standards. This might manifest itself through the planning process in the preparation of secondary plans, block plans, community improvement plans, design guidelines and official plan policies. These standards could also be used in the evaluation of civic development or infrastructure investments, such as the location of new community facilities, the standards by which roads are constructed or improvements in active transportation infrastructure.

The standards included in the health background study terms of reference could serve as a reference for regional and area municipal activities and be finalized with this role in mind. This is the approach currently taken by the proposed amendment. However, it may be determined that a separate guidance document for internal use within the Region and area municipalities would be more appropriate and effective in incorporating an assessment of healthy community standards into these kinds of activities.

CONCLUSION

At the moment, it is challenging to achieve complete communities that support walkability and cyclability. It is occuring when insightful planners, and supportive landowners and developers operate under visionary leadership. Supportive policies and incentives that make it easier to integrate land use and transportation are needed to facilitate the development of complete communities.

The current Regional Official Plan Review process is a critical opportunity to make meaningful amendments that will strengthen the policy trajectory that has been set by the Region. Furthermore, such policy amendments will support the notable health promoting work that our municipal partners have already taken the initiative to complete. The proposed amendments simply allow public health to strengthen its scientifically evidence-based position in support of municipalities on shared goals, while also ensuring consistent application, specificity in requirements and support for municipalities to be locally responsive in their decision-making.

Peel region is a diverse, vibrant and growing area; however, to ensure that we continue to be sustainable and economically prosperous, it is critical for us to maximize the health promoting potential of our communities.

APPENDIX A - POST-NEW YORK CITY SYMPOSIUM HEALTHY PEEL BY DESIGN INTERDEPARTMENTAL WORKGROUPS

Following the Healthy Peel by Design Symposium in the fall of 2012, the following four interdepartmental workshops were established.

Workgroup: **Healthy Food Served and Sold**		
Lead(s)	**Members**	**Projects**
• Peel Public Health • Region of Peel - Real Property Asset Management (RPAM)	**Region of Peel:** • Real Property Asset Management • Peel Public Health • Healthy Workplace (Human Resources) • Human Services	• 7120 Hurontario St. and 10 Peel Centre Dr. – Cafeteria improvements via Request for Proposal (RFP) process
Workgroup: **Actively Designed Buildings**		
Lead(s)	**Members**	**Projects**
• Peel Public Health • Region of Peel – Real Property Asset Management (RPAM)	**Region of Peel**: • RPAM • Peel Public Health • Healthy Workplace (Human Resources) • Transportation Demand Management (Public Works) • Human Services **City of Brampton** – Facilities Management **City of Mississauga**	• 7120 Hurontario – Outdoor space with active design • 7120 Hurontario and 10 Peel Centre Drive – Stair use promotion, monitoring and mural • Brampton City Hall – Stair use promotion • Region of Peel Affordable Housing – Active Design Guidelines

Workgroup: **Healthy Land Use and Transportation Policy**		
Lead(s)	**Members**	**Projects**
• Peel Public Health • Region of Peel – Transportation (Public Works) • Region of Peel – Integrated Planning	**Region of Peel:** • Integrated Planning • Development Services (Public Works) • Transportation (Public Works) • Peel Public Health **Municipal Planning and Transportation departments**	• Health Services will work with Planning to amend the Regional Official Plan • Support the development and implementation of sustainability guidelines • Apply the Health Index to various municipal development applications

Workgroup: **Active Schools and Parks**		
Lead(s)	**Members**	**Projects**
• Peel Public Health • Cities of Mississauga and Brampton, and Town of Caledon	**Region of Peel:** • Peel Public Health **Peel District and Dufferin-Peel Catholic School Boards** **Municipal recreation departments**	• City of Mississauga – adding exercise equipment, posting shared signage to promote physical activity • City of Brampton – partnering to promote informal physical activity • Town of Caledon – using the Community Improvement Plan to promote infrastructure changes to increase physical activity • Creating demonstration sites (St. Alfred Catholic School and Gordon Graydon)

APPENDIX B - CREATING ACTIVE TRANSPORTATION-FRIENDLY DEVELOPMENTS AND COMMUNITIES

Section 5.2.5 of the Region's Active Transportation Plan (2011) identifies the following policies to encourage local municipalities in supporting development of walkable and bicycle-friendly communities and developments:

- Encourage the local municipality to develop live/work land-use strategies that shorten trip lengths and promote active transportation
- Encourage the local municipalities, in developing community plans and in the review of development applications, to create walkable and bicycle-friendly plans that link with public transit and reduce the reliance on the private automobile and associated expansion of the Regional road network
- Encourage and support local municipalities to require transportation demand management strategies to be incorporated into the development approval process, explicitly addressing ways to increase active transportation mode share and link active transportation to public transportation services
- Require transportation studies and traffic impact studies for new development or re-development to explicitly analyze, the needs of active transportation users and priority populations, the impact of the development on Active Transportation (AT), and AT facilities required to service the development
- Encourage local municipalities to require new AT facilities to be built and open for use at the same time that other new transportation systems and new development are opened for use
- Support the area municipalities in adopting end-of-trip facilities for AT, such as bicycle parking (both number of spaces and type of rack, locker or lock-up room/cage), and change rooms, in their zoning by-laws and adopting appropriate guidelines for their design based on land-use type and size.
- Encourage the area municipalities through the site development plan approval process to review the requirements for active transportation design elements, such as public furniture, transit shelters, shade trees/canopies, bicycle parking, etc., in order to facilitate accessible, comfortable and attractive travel for pedestrians and cyclists, and priority populations.
- Work with area municipalities, school boards, and other key stakeholders to explore options to further enhance active transportation in new and existing areas in Peel. Examples of

project could be identifying schools or neighbourhoods to assess the potential for more walking and cycling and incorporating walkable and bicycle-friendly design concepts

APPENDIX C – HEALTH BACKGROUND STUDY TERMS OF REFERENCE

PREAMBLE

1.1 Purpose:

The purpose of the Health Background Study is to ensure that new development and re-development promotes and supports healthy and active communities. These Terms of Reference are designed to create a standardized method for development interests (applicants) to demonstrate their achievement of key healthy community design elements and, in turn, for municipalities to evaluate development proposals based on key community health objectives as specified by the municipality.

The concept of healthy communities is intrinsically tied to the Provincial planning policy's promotion of complete communities. Complete communities meet people's needs for daily living by providing convenient access to an appropriate mix of jobs, local services, a full rage of housing, opportunities for aging in place, and accessible community infrastructure including schools, recreation and open space for their residents. Convenient access to public transportation and options for safe, non-motorized travel is also provided. These considerations have been integrated into these terms of reference.

The Health Background Study is intended to serve as a checklist to evaluate the success of new developments in achieving minimum standards of community health and a forum to encourage applicants to justify their development decisions. It should not be applied alone as a means for approving or rejecting private development proposals, but rather as an informative tool in the application evaluation process.

There are many factors that influence the health of a community. The Health Background Study reflects six of the seven inter-related core elements as identified through the research and design of the Peel Healthy Development Evaluation Tool, which include:

1. Density
2. Service Proximity
3. Land Use Mix
4. Street Connectivity
5. Streetscape Characteristics
6. Parking

The seventh core element, Aesthetics and Human Scale, has been excluded due to its overlap with existing urban design policies and guidelines. The Health Background Study standards outlined in this terms of reference have further been shaped by the expert opinions of planners and urban designers. All developments should comply with local urban design standards.

1.2 How to use this Terms of Reference:

This terms of reference is divided into six main sections that correspond with the six core elements as described above. Each section is divided into the following components:

- **Rationale:** Description of the core element and why it is important from a community health perspective.

- **Objective:** Statement of desired development objective.

- **Standards:** Associated minimum development standards to be achieved by the proposed development. The application and achievement of standards will depend on the site-specific context and scale of the proposed development, and should not be considered as absolutes.

- **Key Questions:** List of key questions that the applicant should consider in the planning and preparation of their proposed development. These questions are intended to initiate dialogue within the development team and with the municipality on strategies/approaches to meet desired outcomes.

- **Reporting/Content Requirements:** Description of the minimum reporting requirements to demonstrate compliance/achievement of the objectives/standards.

1.3 Disclaimer:

It should be noted that the evaluation of a development proposal based on specific core elements may vary depending on the scale of the proposed development, as well as the overriding planning policies in place at the time the development application is made. The core elements are evaluated separately in these terms of reference; however, it is recognized that overlap does occur between elements and that all core elements should be considered holistically when evaluating a development proposal. Consider the question, “How is this contributing to healthy communities?” throughout the reading of these terms of reference.

It is at the discretion of the local municipality to determine the applicability of each core element and the precise evaluation parameters for a specific development proposal. This will occur during the pre-application phase.

Further, participating municipalities shall continue to update their official plan policies and other land use/development policies to reflect the important linkage between community design and community health to ensure that new development contributes to the achievement of key health objectives as the understanding of this linkage evolves over time.

CORE ELEMENT 1: DENSITY

a) Rationale:

Optimal development densities support and facilitate walkability. Interacting closely with other core elements, such as service proximity and land use mix, density influences the concentration and distribution of people and destinations within the built environment. Higher development densities, both residential and non-residential, are better able to support a variety of services, employment opportunities, transit and other community destinations/facilities within walking distance of where people live, work, play and learn. Achieving higher densities also contributes to a more efficient use of land, and encourages the protection of agricultural lands and natural areas that serve important ecological functions that benefit human health both directly and indirectly.

b) Objective:

To achieve effective and high quality density that supports walkable access to/from housing, employment, transit, schools and community services and facilities.

c) Minimum Standards:

All development on Designated Greenfield Areas shall achieve a minimum overall density target of 50 people and jobs per hectare.

☐ All development in designated Urban Growth Centres in the Region of Peel (including downtown Brampton and Mississauga City Centre) shall achieve a minimum overall density target of 200 people and jobs per hectare.

☐ Notwithstanding the above standards, where the local municipality has established higher density targets than those established by The Growth Plan, the higher density target should apply.

d) Key Questions:

What are the current density permissions for the subject lands?

Does the surrounding context reflect high quality and context appropriate density? Should this context be emulated?

Is the density of the proposed development compatible with the surrounding context?

What areas of the site have the opportunity to increase density?

What are the current and projected number of residents and jobs, and how will this influence future transit and service provision?

Based on the proximity of employment opportunities, transit, schools and community services and facilities, will the density of the proposed development support walkable communities and complete streets?

Have the specific additional needs of the elderly been considered?

e) Reporting/Content Requirements:

Greenfield Development – Density calculations that demonstrate unit counts, the type of units and unit size (residential), gross floor area (non-residential), land area and achieved density in relation to Provincial policy.

Redevelopment – Density calculations that demonstrate unit counts, the type of units and unit size (residential), gross floor area (non- residential), land area and achieved density in relation to existing development on the subject site or lands.
A short written description of achieved density and how it complies with objectives and minimum standards.

CORE ELEMENT 2: SERVICE PROXIMITY

a) Rationale:

Like density, proximity to services, employment opportunities and green space facilitates walking. Also, interacting closely with land use mix, proximity to services provides people with a feasible alternative to automobile use, and makes the community more inclusive for those who cannot drive (especially children or seniors).

While some people are willing to walk long distances, setting maximums ensures that a high incentive to walk is maintained through all seasons and weather conditions, and across a reasonable range of physical abilities.

Standard measures for proximity to transit have been well researched. The standard for proximity to continuous high-order transit (subway/light rail) is a 5 minute walk. For lower-order continuous transit (bus), the standard measure is a 2.5 minute walk. The standard measures for appropriate proximity include:

- A 2.5 minute walk (no more than 200 m), appropriate for very frequent, or spontaneous trips, such as access to transit.
- A 5 minute walk (no more than 400 m), appropriate for frequent trips, such as access to basic retail, grocery or community facilities or transit in some cases.
- A 10 minute walk (800 m), appropriate for longer, more deliberate trips to a wider range of retail or community facilities.
- A 15 minute walk (1.2 km) or a half an hour walk (2.4 km), appropriate for substantial trips to major destinations, such as schools or nearby employment clusters.

Distances must be calculated based on the shortest potential walking path of a pedestrian (network distance), as opposed to a straight line (Euclidean distance or “as the crow flies”).

b) Objective:

To achieve a reasonable proximity and cluster of uses, based on walking distance, of key services and employment opportunities to residences and transport nodes. This level of proximity promotes physical activity (walking or cycling), improves mental health by stimulating greater community interaction, and creates a feasible alternative to automobile use, while at the same time reducing greenhouse gas emissions. At the appropriate scale, a community should have a fully array of uses.

c) Minimum Standards:

Transit

☐ The distance between at least 50 per cent of the projected population of the development and a low-order transit stop shall be no more than 200 m. The transit service proposed should provide a direct route to a regional urban node, intensification corridor or smaller higher-density, mixed-use transit supportive activity centre with a maximum transit trip of 30 minutes.

☐ Where a high-order transit route bisects the development area, 75 per cent of the projected population should be within 400 m of it.

☐ Ensure design quality of both transit stops and the journey to the stop. Transit stops should, where appropriate, provide shelter from the sun and inclement weather and seating. High-order transit stops/stations should also include secure bicycle parking facilities.

Neighbourhood Community and Retail Services

- The distance between at least 75 per cent of the projected population and three or more of the following amenities and services must be no more than 800 m:
    - Childcare facility, community garden, park, hospital or health clinic, public library, places of worship, adult/senior care facility, social service facility, performance or cultural space, post office or recreation centre. (Multiple services of the same type may be counted.)
- The distance between at least 25 per cent of the projected population and a minimum of 5,000 m^2 of mixed service commercial and retail space shall be no more than 800 m.
- The distance between at least 75 per cent of the projected population and a minimum of 150 m^2 of mixed service commercial retail space shall be no more than 800 m.
- The distance between at least 90 per cent of the projected population and a playing field, park, square or natural open space should be no more than 400 m.
- The distance between 100 per cent of the projected population and a planned elementary school shall be no more than 1.2 km.
- The distance between 100 per cent of the projected population and a planned secondary school shall be no more than 2.4 km.
- Where appropriate, a new community should provide mixed service commercial retail facilities that can be used by adjacent communities.

Employment

- The development should be within reasonable proximity to an existing or planned employment centre or urban centre. Specifically, the distance should be no more than 10 km.

d) Key Questions:

What are the current zoning permissions, and land use designations (Secondary Plan and Official Plan) for the subject lands and their surroundings?

What is the existing service context of the subject lands? Are sufficient transit, employment and public and retail servicing available or planned?

Based on the proximity of employment opportunities, transit and community services and facilities, will the development support walkability and cycling access?

Have the specific additional needs of the elderly been considered?

e) Reporting/Content Requirements:

Site plans demonstrating the location of residential units within the surrounding context, including: transit stops (indicating higher or lower order), community and retail services (indicating types and Gross Floor Area, respectively), parks, schools (indicating elementary or secondary), and employment or urban centres.

A short written description of the achieved proximity, and how the development complies with the objectives and minimum standards.

CORE ELEMENT 3: LAND USE MIX

a) Rationale:

An equitable mix of household sizes and incomes contributes to a community's overall well -eing and quality of life in residential neighbourhoods. Providing a range of housing options also allows residents to remain with their community as their needs change; from living alone, to as a couple, to as a family, to without children, to as seniors. Proximity of these housing options allows extended families to remain close.

Furthermore, a range and mix of uses within a community, as well as within buildings themselves, provides the opportunity to support walkable communities. Locating employment, institutional and industrial uses in close proximity allows for the development of a more compact urban form, which supports the provision of public transit nodes, walkable neighbourhoods and safer communities. More specifically the location of these uses, such as the provision of retail uses on the ground floor, should be encouraged.

Certain commercial uses that discourage walking, such as drive-throughs, are also dealt with in this core element.

b) Objective:

Recognizing that land use mix is closely associated with service proximity and the surrounding context, the primary objective of this element is to promote a broad mix of land uses, with a particular focus on housing mix.

c) Minimum Standards:

- Where the scale of the residential community is large enough, a range of uses should be provided, as follows:
    - for communities of 5,000 people or more, provide neighbourhood-scale retail and services (such as corner stores, elementary school, library, etc.)
    - for communities of 10,000 people or more, provide a full-range of uses, including larger-scale retail, services and employment opportunities.

- Where the scale of employment lands is large enough, small scale commercial retail and services should be encouraged, where appropriate.

- Where the scale of the community permits, it should include dwelling structures from all three of the following housing type groups, with no group making up more than 50 per cent or fewer than 10 per cent of total units:

    i. Single detached, semi-detached, and duplex
    ii. Townhouses and multiplex
    iii. Apartment building

- Special housing types, such as group homes or seniors' residences, should be encouraged.
- Secondary suites should be encouraged where appropriate.
- Live-work units should be encouraged where appropriate.
- Drive-through uses shall generally not be permitted. Drive-through uses may be permitted where they do not impact sensitive land uses. In all cases, site design shall be pedestrian-oriented.
- The location of retail uses on the ground floor of multi-unit and mixed use buildings should be encouraged.

d) Key Questions:

What are the current zoning permissions and land use designations (Official Plan and Secondary Plan) for the subject lands?

Is there sufficient diversity of housing and unit types in the community to accommodate households of varying income, size and needs? Can the community accommodate a full life-cycle of housing needs for persons with varying physical abilities?

How can infill development contribute to ensuring a diversity of housing types?

How can a mix of uses be integrated into the development/redevelopment?

Have the specific additional needs of the elderly been considered?

d) Reporting/Content Requirements:

A count of proposed units and their types. A short written description of achieved mix and how the development complies with objectives and minimum standards.

CORE ELEMENT 4: STREET CONNECTIVITY

a) Rationale:

A connected street network is essential for encouraging active transportation. When a dense grid/connector network is achieved, pedestrians have access to the greatest freedom of movement and the most direct routes to their destinations. Connectivity is evaluated through the avoidance of certain street types (such as cul-de-sacs) and through block size. For infill development, the ability to influence street layout is limited. In this case, proposed infill development should strive to ensure a better street environment for pedestrians through attention paid to design details.

b) Objective:

To promote a highly connected network of streets and active transit nodes to support opportunities for active transportation.

c) Minimum Standards:

- Infill development should identify opportunities to increase street connectivity.
- Street networks and off-road paths in greenfields should always :
- Provide the maximum choice for how people will make trips; take full account of the kinds of movement a development will generate; and
- make clear connections to existing routes and facilities.
- Cul-de-sacs are not permitted unless required for technical reasons.
- Crescent streets, reverse frontage lots and loop roads must not constitute more than 20 per cent of total street frontage and should be discouraged.
- Blocks in the proposed development must not exceed 80 m x 150 m in size. Exceptions are made for blocks consisting solely of parkland or of employment uses.
- Intersections should be frequent, with street blocks decreasing in size as density increases.
- Sidewalks, bike lanes and multi-use paths should connect to street networks, major destinations and transport nodes.

d) Key Questions:

Does the proposed development have a sufficient density of intersections and sufficiently small block size to encourage active transportation?

How can infill development contribute to a higher level of street connectivity on the site and beyond?

How is the layout of parks and open spaces used to improve the directness and freedom of pedestrian and bicycle travel?

Has the proposed plan set out direct routes through a permeable and linked road and pedestrian network including trails, to ensure that short walking distances can be achieved?

Have the specific additional needs of the elderly been considered?

e) Reporting/Content Requirements:

Site plans demonstrating the number of intersections and block sizes within the proposed development, and a brief summary showing how it complies with the requirements.

CORE ELEMENT 5: STREETSCAPE CHARACTERISTICS

a) Rationale:

In order to encourage walking and cycling activity, streets must provide appropriate facilities for pedestrians and cyclists. While walking and cycling may be possible without specific amenities, a certain level of comfort and prioritization should be offered through design to create inviting public spaces and promote injury prevention. Core element five includes minimum standards for sidewalks and bicycle lanes, adequate shading, various traffic calming devices and sufficient lighting for pedestrian safety. Additionally, recognition and integration with cycling and trails facilities will ensure continuous links to key transport nodes and areas of interest.

b) Objective:

To promote active transportation through street and sidewalk design.

c) Minimum Standards:

Sidewalk Amenities

- All streets must have sidewalks on each side that are at least 1.5 m wide in low-density residential areas, and at least 2 m wide in medium- density residential neighbourhoods, high-density residential neighbourhoods, mixed use areas and commercial areas.

- A variety of street trees that are hardy, resilient and low maintenance should be planted at regular intervals (as specified by the municipality) adjacent to all streets.

- Transit shelters and other street furniture should be provided, especially on major pedestrian routes. Other street furniture may include benches, waste receptacles, newspaper outlets, community information boards, water fountains, public washrooms, bicycle parking and bicycle sharing system components.

Cycling Amenities

- A connected and destination-oriented bikeway network should be provided throughout the community, including a variety of on- and off-street bikeway facilities that provide an appropriate degree of separation from motorized traffic, given the speed and volume of traffic on the street. These on-street bikeway facilities may include (but are not limited to) bicycle lanes, cycle tracks, sharrows, signed routes, bicycle boulevards and multi-use paths on the boulevard.
- Where there is a local bicycle plan, the bikeway network proposed in the plan shall be implemented in the development area, and opportunities to enhance or connect to the proposed bikeway network should be identified.

- At a minimum, 100 per cent of the population should be within 150 m of a continuous and connected bikeway facility.

Intersections

- All intersections should be designed to increase the visibility of cyclists and pedestrians, give them priority, reduce crossing distance and provide adequate crossing time. Intersection design elements may include, but are not limited to:

- Pavement treatments and markings for pedestrian crossings (e.g., brick paving, zebra/ladder markings)
- Curb cuts/ramps
- Raised crosswalk
- Curb extension/bulb out
- Centre Median or refuge island
- Pedestrian scramble (a.k.a. Barnes dance)
- Bicycle box
- Conflict zone markings for bicycles (e.g., coloured lane, skip lines, chevrons, sharrows)
- Audible pedestrian crossing signals
- Countdown signals
- Leading pedestrian and/or bicycle signals (advance walk/bike signal)
- Pedestrian and/or bicycle actuated signals
- Right-turn on red light prohibitions
- Mid-block signalized crossings

Lighting

- All mixed-use streets must have an average luminance of 10 lux, with a minimum of 5 lux.

- Pedestrian-level street lamps of 4.6 m in height or less, spaced apart no more than 30 m, must be provided on all streets.

Wayfinding

- A wayfinding system should be implemented on a community-wide basis to allow residents and visitors to determine their location; identify key destinations (parks, transit stations, community and cultural facilities, shopping centres, off-road trails); and develop a plan to take them from their location to desired destination by walking or cycling. The wayfinding system may include maps, directional signs or other elements, and should be useful and easy to understand.

Traffic Calming

- In greenfield development, or where new streets are introduced through infill development, traffic calming will be achieved on neighbourhood streets by using:

    - Minimum traffic lane widths
    - Minimum number of traffic lanes in the roadway

        - Pedestrian-priority streets, woonerfs or home-zones (speed limit under 15 km/hr, vehicles must yield to pedestrians and cyclists)

- For infill development, traffic calming should be achieved on existing neighbourhood streets by using any of, but not limited to, the following elements:

    - Reduced/minimum traffic lane width
    - Reduced/minimum number of traffic lanes in the roadway
    - Pedestrian-priority streets, woonerfs or home-zones (speed limit under 15 km/hr, vehicles must yield to pedestrians and cyclists)
    - Speed humps
    - Bollards (short vertical posts)
    - Channelization islands (raised islands that force traffic to turn in a particular direction)
    - Chicane (curb bulges or planters or alternating sides, forcing motorists to slow down)
    - Choker (raised islands in parking zones that narrow a roadway)
    - Curb extension, planter, or centerline traffic island that narrows traffic lanes
    - Horizontal shift (a lane centerline that curves or shifts)
    - Rumble or warning strip
    - Semi-diverter or partial closure (restricts entry and limits traffic flow at intersections)
    - Signal timing to reduce traffic speeds
    - Radar trailer that shows drivers their current speed and the posted speed limit
    - Traffic circles or roundabouts
    - Speed table

- While increasing comfort and safety for pedestrians, the design of traffic calming elements should not create undue hazards or obstacles for cyclists.

d) Key Questions:

What are the municipally-designated standards for sidewalk and bicycle lane dimensions and design? What are the standards for other amenities?

Is there a local Bicycle/Walking/Active Transportation Plan? If yes, what bicycle or pedestrian facilities are designated or recommended within the development site?

Does the proposed community provide sufficient pedestrian and bicycle amenities to encourage active transportation?

How can intersections been designed to increase safety and comfort for pedestrians and cyclists?

Which neighbourhood streets should be targeted for traffic calming? How will traffic calming be achieved on these streets?

Have the specific additional needs of the elderly been considered?

e) Reporting/Content Requirements:

A detailed and integrated plan of the entire proposed community, demonstrating widths of sidewalks, bikeways, street tree planting, intersection treatments, traffic calming measures, pedestrian priority streets, bicycle amenities and pedestrian lighting fixtures (including illuminance level).

A short written description of road and sidewalk characteristics and how the development complies with objectives and minimum standards.

CORE ELEMENT 6: PARKING

a) Rationale:

Historically, planning has been overly accommodating to automobiles by providing very high parking requirements. However, large surface parking lots, oversized garages and significant front yard parking harm the aesthetic of the public realm. Likewise, abundant low-cost parking provides little incentive for residents, employees and shoppers to use other means of transportation. Logically, frequent transit, cycling and walking opportunities should facilitate lower parking requirements.

b) Objective:

To discourage automobile use and promote alternative modes of transit through modified parking standards.

c) Minimum Standards:

Automobile Parking

- Reductions in parking requirements should be given to:
  - buildings and other facilities within 400 m of a transit stop; and
  - apartments/condominiums offering car share parking spaces (with each car share space equivalent to 10 regular spaces).

- On-street parking should be included on all streets except where inappropriate for technical or safety reasons.

- Efficient use of parking should be promoted by identifying systems for sharing parking spaces by two or more user groups at different times of the day or week (for example, office staff during weekdays and restaurant clientele in the evenings and on weekends), and by providing preferential parking for carpool vehicles.

- Where available, economic incentives should be identified and utilized to provide structured parking, rather than surface parking.

- Where surface parking is provided, it should be designed to minimize negative aesthetic and environmental impacts. This can be achieved by locating the parking lot away from the street frontage and by incorporating the following into the parking lot design:

  - Tree planting
  - Landscaping
  - Stormwater management
  - Porous/permeable surfaces
  - Light-coloured materials (rather than black asphalt)
  - Pedestrian access and circulation

Bicycle Parking

- All new developments should meet or exceed the higher of: j

a) Local bicycle parking requirements (provided in local zoning by-laws, bicycle master plans); or
b) The minimum bicycle parking standards outlined in Table 1.

Table 1: Minimum Bicycle Parking Standards, by Use and Type

Use	Minimum Spaces by Bicycle Parking Type	
	Occupant/Employee*	**Visitor****
Multi-unit Residential	0.7/unit	0.8/unit
Retail, Services, & Community Facilities	0.1/100 m2	3 + 0.25/100 m2
General Office	0.15/100 m2	3 + 0.25/100 m2
Medical Office	0.15/100 m2	3 + 0.1/100 m2
Hospital	0.06/100 m2	3+ 0.06/100 m2
Elementary/Secondary School	0.06/100 m2	3+ 0.06/100 m2
Post-Secondary School	0.06/100 m2	3 + 0.2/100 m2
Other non-residential (e.g. Industrial)	0.06/100 m2	0.1/100 m2
High-order Transit Station	*Complete a bicycle parking demand estimate for the station, for example using boardings, alightings and local bicycle mode share data.*	

*Occupant/Employee (a.k.a long-term) parking refers to secure, enclosed bicycle storage that is locked, weather protected and easily accessible to residents and/or workers. Signage indicating the location and information on use of these parking facilities should be provided.

**Visitor (a.k.a short-term) parking refers to outdoor, covered/un-covered bicycle racks.

c) Key Questions:

Is infrastructure for transit in place, and what is the level of transit service currently provided?

Is the automobile parking for the proposed development sufficient or excessive, given the planned level of transit service, and pedestrian and cycling facilities?

Can automobile parking be provided more efficiently through an unbundled or shared system?

Has paid parking been considered to reflect the cost of providing parking?

How are the environmental and aesthetic impacts of surface parking being minimized or mitigated?

Is there sufficient visitor and occupant bicycle parking provided in the proposed development?

Have the specific additional needs of the elderly been considered?

d) Reporting/Content Requirements:

A plan showing the number and distribution of bicycle (visitor and occupant) and automobile parking (private and on-street), along with the proposed uses and Gross Floor Area (for industrial and commercial buildings) or number of residential units.

The location of transit stops, to give context to numbers of bicycle and automobile parking spaces.

A short written description explaining how the automobile parking supply is being minimized and used more efficiently.

References

(1) Sassi F, Cecchini M, Lauer J, Chisholm D. Improving lifestyles, tackling obesity: The health and economic impact of prevention strategies. OECD Health Working Papers No. 48. Paris: Organization for Economic Co-operationa and Development, 2009.

(2) Ontario Ministry of Health and Long-Term Care. Ontario Public Health Standards. Toronto: Queen's Printer for Ontario, 2008.

(3) Institute for Clinical Evaluative Sciences. Ontario Diabetes Database. 2007.

(4) Peel Public Health. A Picture of Health: A Comprehensive Report on Health in Peel. Brampton, ON: Peel Public Health, 2008.

(5) Health Canada. Canadian body weight classification in adults. 2006. Available from: www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/weight_book_tc-livres_des_poids_tm-eng.php#a2.4. Accessed: 6-7-2012.

(6) World Health Organization. Global database on body weight classification - BMI classification. 2012. Available from: http://apps.who.int/bmi/index.jsp?introPage=intro_3.html. Accessed: 6-7-2012.

(7) Peel Public Health. Student Health Survey. 2011. Available from: www.peelregion.ca/health/health-status-report/studenthealth2005/. Accessed: 6-7-2012.

(8) Katzmarzyk PT. The economic costs associated with physical inactivity and obesity in Ontario. Health Fitness J Can 2011; 4(4):31-40.

(9) Butland B, Jebb S, Kopelman P, McPherson K, Thomas S, Mardell J et al. Foresight. Tackling obesities: Future choices - project report. London: Department of Innovation Universities and Skills, 2007.

(10) Heath GW, Brownson RC, Kruger J, Miles R, Powell KE, Ramsey LT et al. The effectiveness of urban design and land use and transport policies and practices to increase physical activity: a systematic review. J Physical Activity Health 2006; 3(Suppl 1):S55-S76.

(11) Pucher J, Buehler R, Bassett DR, Dannenberg AL. Walking and cycling to health: a comparative analysis of city, state, and international data. Am J Public Health 2010; 100(10):1986-1992.

(12) Brody S. The characteristics, causes, and consequences of sprawling development patterns in the United States. Nature Educ Knowl 2013; 4(5):2.

(13) Brownson RC, Boehmer TK. Patterns and trends in physical activity, occupation, transportation, land use, and sedentary behaviors. Prepared for: The Transportation Research Board and the Institute of Medicine Committee on Physical Activity, Health, Transportation, and Land Use., 2005.

(14) Swinburn BA, Sacks G, Hall KD, McPherson K, Finegood DT, Moodie ML et al. The global obesity pandemic: shaped by global drivers and local environments. Lancet 2011; 378(9793):804-814.

(15) Samitz G, Egger M, Zwahlen M. Domains of physical activity and all-cause mortality: systematic review and dose-response meta-analysis of cohort studies. Int J Epidemiol 2011; 40(5):1382-1400.

(16) Department of Health. At Least Five a Week; Evidence on the Impact of Physical Activity and its Relationship to Health. A report from the Chief Medical Officer. London, England: Department of Health, 2004.

(17) Buehler R, Pucher J, Merom D, Bauman A. Active travel in Germany and the U.S. Contributions of daily walking and cycling to physical activity. Am J Prev Med 2011; 41(3):241-250.

(18) Mackett RL, Brown B. Transport, Physical Activity and Health: Present Knowledge and the Way Ahead. London, England: UK Transport Research Centre, 2011.

(19) Hamer M, Chida Y. Active commuting and cardiovascular risk: a meta-analytic review. Prev Med 2008; 46(1):9-13.

(20) Laverty AA, Mindell JS, Webb EA, Millett C. Active travel to work and cardiovascular risk factors in the United kingdom. Am J Prev Med 2013; 45(3):282-288.

(21) Frank LD, Andresen MA, Schmid TL. Obesity relationships with community design, physical activity, and time spent in cars. Am J Prev Med 2004; 27(2):87-96.

(22) Kahlmeier S, Cavill N, Dinsdale H, Rutter H, Gotschi T, Foster C et al. Health economic assessment tools (HEAT) for walking and cycling. Methodology and user guide. Copenhagen: WHO Regional Office for Europe, 2011.

(23) Grabow ML, Spak SN, Holloway T, Stone B, Mednick AC, Patz JA. Air quality and exercise-related health benefits from reduced car travel in the midwestern United States. Environ Health Perspect 2012; 120(1):68-76.

(24) Tremblay MS, Colley RC, Saunders TJ, Healy GN, Owen N. Physiological and health implications of a sedentary lifestyle. Appl Physiol Nutr Metab 2010; 35(6):725-740.

(25) The Region of Peel's Active Transportation Study. Active Transportation Plan. Region of Peel: 2011.

(26) Robert Wood Johnson Foundation. Signs of progress in efforts to reverse childhood obesity. 2013. Available from: http://www.rwjf.org/en/about-rwjf/program-areas/childhood-obesity.html. Accessed: 10-8-2013.

(27) Ewing R, Cervero R. Travel and the built environment: a meta-analysis. J Amer Planning Assoc 2010; 76(3):265-294.

(28) Canadian Mortgage and Housing Corporation. Comparing Canadian New Urbanist and Conventional Suburban Neighbourhoods. Socio-economic Series: 10-003. Ottawa: CMHC, 2010.

(29) Cao XJ, Mokhtarian PL, Handy SL. Examining the impacts of residential self-selection on travel behavior: a focus on empirical findings. Transport Rev 2009; 29(3):359-395.

(30) Giles-Corti B, Bull F, Knuiman M, McCormack G, Van NK, Timperio A et al. The influence of urban design on neighbourhood walking following residential relocation: longitudinal results from the RESIDE study. Soc Sci Med 2013; 77:20-30.

(31) U.S.Environmental Protection Agency. Smart growth: a guide to developing and implementing greenhouse gas reduction programs. Washington: EPA, 2011.

(32) Norman J, MacLean HL, Kennedy CA. Comparing high and low residential density: Life-cyle analysis of energy use and greenhouse gas emissions. J Urban Plann Dev 2006; 132(1):10-21.

(33) Metrolinx. Costs of Road Congestion in the Greater Toronto and Hamilton Area: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan. Greater Toronto Transportation Authority, 2008.

(34) Metrolinx. The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area. Strategy #7 – Build Communities that are Pedestrian, Cycling and Transit-Supportive. 2012. Available from: http://www.metrolinx.com/thebigmove/en/strategies/strategy7.aspx. Accessed: 18-6-2013.

(35) Ontario Ministry of Transportation. Southern Highways Program: 2012-2016. 2012.

(36) Smart Growth America. Building Better Budgets. A National Examination of Fiscal Benefits of Smart Growth Development. 2013.

(37) IBI Group. The implications of Alternative Growth Patterns on Infrastructure Costs. Calgary: City of Calgary, 2009.

(38) Frank, L., Chapman, J., Kershaw, S., and Kavage, S. City and Regional Residential Preference Survey Results for Toronto and Vancouver: a CLASP Final Report. 2012. Available from: www.toronto.ca/health/hphe/pdf/clasp.pdf. Accessed: 10-9-2013.

(39) Belden Russonello and Stewart. The 2011 Community Preference Survey: What Americans are Looking for When Deciding Where to Live. 2011. Available from: www.stablecommunities.org/sites/all/files/library/1608/smartgrowthcommsurveyresults2011.pdf . Accessed: 10-9-2013.

(40) CAA. Driving Costs. Beyond the Price Tag: Understanding Your Vehicle's Expenses. 2012.

(41) Peel Public Health. Changing Course: Creating Supportive Environments for Healthy Living in Peel. Region of Peel, 2012.

(42) Ontario Ministry of Municipal Affairs and Housing. Provincial Policy Statement Review: Under the Planning Act. Draft policies. Toronto: 2012.

(43) Tandon S. The evolution and contradiction of Ontario's land-use oversight mechanisms and their implications for urban sprawl. CURE Policy Brief 2011.

(44) Ontario Ministry of Infrastructure. Places to Grow: The Growth Plan for the Greater Golden Horseshoe. Toronto: 2006.

(45) Buechler R, Pucher J. Walking and cycling in Western Europe and the United States: Trends, policies and lessons. Transit News 2012; 280(May-June):34-42.

(46) Complete Streets for Canada: City of Mississauga. 2012. Available from: http://completestreetsforcanada.ca/case_study/city-mississauga. Accessed: 15-8-2013.