



**2014 PETERBOROUGH CITY AND COUNTY**

# **ACTIVE TRANSPORTATION & HEALTH**

**INDICATORS REPORT**









# ACTIVE TRANSPORTATION & HEALTH

## ..... INDICATORS REPORT .....

*This report is a project of:*

***the PETERBOROUGH COUNTY-CITY HEALTH UNIT***  
**GREENUP**  
**&**  
***the CITY OF PETERBOROUGH***

*Partial funding for this report was provided by:*









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# ACKNOWLEDGMENTS

The authors of this report would like to extend a sincere thank you to all of the individuals and organizations who have contributed to this project. The development of the 2014 *Peterborough City and County Active Transportation & Health Indicators Report* was a substantial undertaking and we're grateful for all of the time and energy that has been dedicated to its production.

We would like to acknowledge the following people who were directly involved in providing us with the data and details contained in this report:

Charmalee Sandanayake, GIS Technologist, City of Peterborough  
Tammy Sikma, GIS Manager, County of Peterborough  
Andrew Burdett, Transit Operations Supervisor, Peterborough Transit  
Tegan Moss, Executive Director, B!KE: the Peterborough Community Cycling Hub  
Lindsay Stroud, Chair, Active and Safe Routes to School Peterborough  
Stephen Hill, Associate Professor, Trent University  
Todd Barr, Executive Director, Trent Centre for Community-Based Education

We would also like to thank the following organizations, who contributed supporting information:

Peterborough Bicycle Advisory Committee  
Peterborough Lakefield Community Police Service  
Peterborough Regional Health Centre  
General Electric Peterborough  
Kawartha Pine Ridge District School Board  
Fleming College  
Trent University  
Ontario Public Service  
Greyhound Canada  
Metrolinx, GO Transit  
Coach Canada

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# EXECUTIVE SUMMARY

Across the region, rates of active transportation are on the rise. That's good news, but how can this momentum be sustained?

The transportation decisions individuals make are complex. They're informed not only by personal considerations, but also by the patterns and policies that shape one's social landscape, and the built and natural forms that shape one's physical landscape. Understanding how to influence these landscapes in order to facilitate safe, healthy, sustainable, and economically beneficial travel is a challenge that all urban and rural communities will face in the coming years. Each solution to this challenge will necessarily be rooted in the needs of the local population.

This means that before one can meaningfully address these challenges, it is first necessary to understand the local determinants of travel; to consider how local policy, infrastructure, and programming interventions influence levels of use; and, to evaluate the impact active transportation has on the health of individuals and the environment.

## TO THIS END, THIS REPORT SEEKS TO ACHIEVE THE FOLLOWING OBJECTIVES:

- To increase awareness about the impact transportation has on personal health, the health of the community, and the health of the natural environment;
- To enhance understanding regarding factors that influence levels of walking, cycling, and transit ridership;
- To identify critical issues and trends that can inform the development of evidence-based policies;
- To establish indicators that can be used to meaningfully measure progress toward a more walkable, bikeable, and transit-friendly community; and,
- To highlight successes and opportunities for future intervention.

For *elected officials and community decision-makers*, the development of robust pedestrian, cyclist, and transit indicators will provide the information necessary to support informed and grounded decision-making processes. For *planners, advocates, health professionals and other stakeholders working within the field*, this report will provide metrics to evaluate the efficacy of projects and strategies, and to better communicate the relationship between health, safety, and levels of use. For *members of our community*, this report helps to better illustrate the complexity of local travel decisions, and to demonstrate the impact these decisions have on individual health and the health of the community. Travel behaviour matters and, most of all, this report demonstrates why.

## DETERMINANTS OF TRAVEL

Chapter One establishes demographic travel trends, and makes the connection between personal characteristics and transportation choices. Across the region, the use of active transportation is strongly linked to age, gender and income. Males between the ages of 15 to 25 years are two times more likely to cycle than any other age group, while persons who earn less than the

city-wide median income are ten times more likely to ride transit to work than persons earning more. While distance remains a significant barrier to walking and cycling in the County, there is great potential to replace vehicle trips with walking and cycling in the City. Eighty percent of City residents commute to work within the City limits, and more than one quarter of all trips made for any purpose are less than 2 km - a distance widely considered to be walkable. The potential for cycling in the City is ever greater - nearly three quarters of all trips made by City residents are within a bikeable 5 km distance.

## BUILT ENVIRONMENT

So why aren't people walking and biking more often? Chapter One explores how density and land-use mix influence perceived walkability and bikeability, and highlights neighbourhoods in our community where the built environment is supporting elevated rates of active transportation. Chapter Two provides a snapshot of travel behaviour across the City and County, while Chapter Three presents an overview of walking, cycling and transit facilities in both the City and County. The impact these facilities have on levels of use is demonstrated using data collected in the Peterborough Pedestrian and Cyclist Counts. Chapter Four examines the impact local and provincial policies have had on our built environment and discusses how they are helping to inform the development of more walkable and bikeable communities.

## PROGRAMMING & ADVOCACY

Although the presence of supportive infrastructure influences transportation decisions, changes to the built environment will not happen over night. Chapter Five showcases a sample of the community-based programming and advocacy initiatives that are helping to create a culture of walking, cycling and transit ridership in Peterborough City and County. Many of these programs and initiatives have received national acclaim. They have been helping to increase levels of active transportation use through broad-based engagement and have also helped to establish the groundswell of support necessary to rationalize more significant investments in supportive infrastructure.

## HEALTH & SAFETY

Investments made in active transportation infrastructure and programming can have a measurable impact on physical activity levels. Increases in walking and cycling positively contribute to one's health, which contributes to lower incidence of chronic disease and obesity. Chapter Six highlights the relationship between physical activity and chronic disease in the Peterborough region. Chapter Seven outlines some of the risks associated with the use of active transportation, identifies who is most adversely impacted by these risks, and considers how these risks might be mitigated.

The 2014 *Peterborough City and County Active Transportation & Health Indicators Report* was developed to advance progress toward a healthy, efficient, and environmentally sustainable transportation system in the Peterborough region. Its release is an exciting opportunity to reflect on the progress that has been made and to chart a course forward. Thank you again to all of the individuals and organizations who contributed to the development of this project.



# OVERVIEW OF DATA SOURCES

## **STATISTICS CANADA, MANDATORY SHORT-FORM CENSUS, 1996, 2001, 2006 & 2011**

Canada's mandatory Short-Form Census includes 8 questions and probes basic household composition information. The Short-Form Census is sent to 100% of Canadians. The Short-Form Census is conducted every five years. 70% of respondents received a paper survey by mail, while the remaining 30% received a form from an enumerator. The form could be completed online or in hard copy and returned by mail to Statistics Canada. In 2011, the response rate for the Short-Form Census was 98%, up from 96.5% in 2006.

## **STATISTICS CANADA, MANDATORY LONG-FORM CENSUS, 1996, 2001 & 2006**

Canada's mandatory Long-Form Census included an additional 53 questions, probing respondents on a variety of demographic, social, and economic subjects, including things like education, income and housing, labour market activities, and transportation. Until 2010, the long-form was sent to 1 in 5 Canadians. While it was mandatory, the response rate was approximately 94%. Results are available for geographic areas as small as the census tract level. Global response rates are determined for each of the census geographic areas. Geographic areas with a non-response rate higher than or equal to 25% are suppressed from the tabulations. Geographic areas with a global non-response rate of higher than 5% but lower than 25% are flagged as being of lower quality, but are not suppressed.

The Long-Form Census was also conducted every five years, in combination with the Short-Form, and was distributed in the same manner. Transportation data collected through the Long-Form Census related to the trip to work exclusively. Nineteen ninety-six was the first year 'mode of transportation to work' data was collected. Data from the 1996, 2001 and 2006 censuses has been used extensively in the 2014 *Peterborough City & County Active Transportation & Health Indicators Report* to develop many of the indicators as well as the travel trend maps.

## **STATISTICS CANADA, NATIONAL HOUSEHOLD SURVEY (NHS), 2011**

The first voluntary NHS was undertaken in 2011, replacing the mandatory Long-Form Census. Although this survey was sent to 1 in 3 households, the larger sampling size did not equate to a greater response rate. The response rate for the NHS was 68.6%, with much lower responses in many smaller and rural communities. Although Statistics Canada increased the point of suppression to a non-response rate of 50%, they were unable to report data for approximately 25% of census subdivision or municipalities. If the non-response rate standards from the 2006 census had been maintained, responses from 67% of tracts would have been suppressed - and at the census tract level, data for more than 90% of tracts would have failed to meet the 2006 standards. Indeed, even by the new standards, Peterborough had the highest non-response rate for any Census Metropolitan Area in Canada, at 36.3%. While the global non-response rate for the City alone was somewhat lower, at 32.4%, data for one of the City's census tracts was suppressed. In the County, where the non-response rate was 38.1%, data for half of all census tracts was suppressed. In all cases, the global non-response rate for County census tracts exceeded what would have been considered acceptable in 2006.

In recognition of the low local response rates to the NHS and the increase in acceptable maximum global non-response rates, which could contribute to unknown biases, the data from the NHS has been used minimally in this report. It has not been used at all in relation to previous Long-Form Census data, for instance in the development of travel trends over time. In the context of this report, the unreliability

of the NHS at a local level compromises our ability to track and predict travel behaviour over time and to produce timely documents. While there are other data sources available, they are more limited in scope or of lower quality.

### **UNIVERSITY OF TORONTO, TRANSPORTATION TOMORROW SURVEY, 1996, 2001 & 2006**

The Transportation Tomorrow Survey is the largest and most comprehensive travel survey conducted in Ontario. The Transportation Tomorrow Survey is conducted every five years on behalf of municipalities and has been undertaken in the Peterborough area since 1996. Trip data is collected for persons over the age of 11 years. Collected trip data details a ledger of travel information over an entire week-day, including: mode selection; trip start times; origin and destination points; and, trip purpose, which includes various personal trip categories as well as work-based trips. Demographic data related to household and personal characteristics are also collected. In 1996, 2001 and 2006, data samples were expanded to represent the total population of the survey area using dwelling counts from the Short-Form census collected during the corresponding year. Data are available for areas as small as census tracts.

The Transportation Tomorrow Survey is undertaken by telephone survey. Respondents are called on listed residential telephone numbers. In 2006, the 18 to 27 age group was underrepresented by 20%, which was higher than previous surveys. While the data quality was deemed to be acceptable in the 2006 survey, the increasing use of cell phones as a substitute for landlines has become an even more significant concern for obtaining a representative sample in the 2011 survey. When the 2011 data was expanded by dwelling unit, distortions in the age distribution of the population were discovered. As a result, the 2011 data was expanded by population, with age adjustment factors applied to correct for distortions related to sample bias. The University of Toronto has cautioned against using the 2011 data in comparison with earlier data to elucidate trends over time. In most cases, only the 1996, 2001 and 2006 data has been included in this report.

### **CITY OF PETERBOROUGH, HOUSEHOLD TRANSPORTATION SURVEY, 2010**

The City of Peterborough Household Transportation Survey (HTS) was undertaken in autumn, 2010. The survey was a telephone survey, conducted using randomly selected, listed residential telephone numbers. A sample of 410 residents was achieved. Participants were required to live in the City of Peterborough and to be 19 years of age or older. The sample size provides a 95% confidence level. The survey included a detailed ledger of travel information collected over an entire weekday, and also asked respondents to indicate perceived barriers to the use of various travel modes. Only data relating to travel barriers has been included in this report.

### **PETERBOROUGH PEDESTRIAN AND CYCLIST COUNTS, 2012 & 2013**

Annual, manual pedestrian and cyclist counts were completed in September 2012 and 2013 at 24 intersections across the City of Peterborough. These counts are undertaken using the count and expansion methodologies published by the National Documentation Project in the US, as there are very few Canadian municipalities engaging in counts and no published national methodologies. Counts are recorded in 15-minute intervals over a period of two hours at morning and evening peak periods for two days within the same week. Pedestrians are simply counted as they pass through the intersection. Cyclist data indicates a count, but also expresses the direction of travel (which allows us to determine the facility-type they're riding on), whether they were riding on the sidewalk, and if they were wearing a helmet.

This data allows for evaluation of site-specific cycling and pedestrian infrastructure interventions and also for corridor analysis. While little comparative analysis of this data has been included in the report,

given the limited count period, it has been used extensively to map cyclist and pedestrian patterns and frequency across the City. These counts are a partnership of the City of Peterborough, GreenUP, Trent University and the Trent Centre for Community-Based Education.

### **STATISTICS CANADA, CANADIAN COMMUNITY HEALTH SURVEY, 2011/2012**

The Canadian Community Health Survey (CCHS) is an annual survey designed to gather data at sub-provincial levels of geography. The survey covers the population 12 years of age or over. A sample of 65,000 respondents is collected on an annual basis. The sample is selected using a combination of methods, including selecting from an area frame, a list of phone numbers, and a Random Digit Dialing frame. Responding to the survey is voluntary. Estimates from CCHS data are made by using the Ontario Share File provided by the Ministry of Health and Long-Term Care. Statistical significance was assessed using confidence intervals. Data included in the report is from the most current available survey, 2011/2012.

### **CANADIAN INSTITUTE FOR HEALTH INFORMATION (CIHI), NATIONAL AMBULATORY CARE REPORTING SYSTEM, 2003 - 2012**

The data collected through the National Ambulatory Care Reporting System includes information for hospital-based and community-based ambulatory care, day surgery, outpatient clinics and emergency departments. For the purposes of this report, only emergency department visits were collected. For persons injured in a transportation-related incident, the mode of transportation and cause of incident is recorded.

### **CIHI, DISCHARGE ABSTRACT DATABASE, 2003 - 2012**

The data collected through the Discharge Abstract Database captures administrative, clinical and demographic information on hospital inpatient discharges (persons who have been admitted to the hospital for an overnight stay). For persons injured in a transportation-related incident, the mode of transportation and cause of incident is recorded.

### **STATISTICS CANADA, ONTARIO REGISTRAR GENERAL, 2003 - 2009**

The Ontario Registrar General provides Vital Statistics Mortality Data, which includes cause of death. For persons killed in a transportation-related incident, the mode of transportation and cause of incident is recorded. Death data were extracted by lead cause group on the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD10) code for the primary cause of death. Data are provided by the Ministry of Health and Long-Term Care.

### **ONTARIO MINISTRY OF TRANSPORTATION, COLLISION REPORTING STATISTICS, 2006 - 2010**

The Ministry of Transportation compiles information completed on standardized collision reporting forms at local police departments. These data indicate mode of transportation, traveler action and condition, fault, as well as accident location. Collision reporting forms are completed at collision centres or when police are called to the scene of an incident. In most cases, these represent collisions between a motor vehicle and a pedestrian/cyclist. In cases where a pedestrian/cyclist is injured but not killed in a non-vehicular incident (such as a fall), the police will usually not be notified and relevant data will be collected within the National Ambulatory Care Reporting System or the Discharge Abstract Database.



# CHAPTER ONE

## COMMUNITY PROFILE & LOCAL DETERMINANTS OF TRAVEL

Walking, cycling and transit are good for our personal health, our local economies, and the environment. Understanding the factors that influence the transportation decisions being made by Peterborough City and County residents can help us to support a transition to active, healthy and sustainable travel in our region. However, the transportation decisions individuals make are complex. They are informed by physical factors such as city, town, or region size, geography and composition (e.g., amounts of vegetation, waterways, bike paths, roadways and building densities); by personal factors such as age and income; and, by the kinds of supportive resources and services that are available locally.

The first chapter of this report evaluates how personal and physical factors influence levels of walking, cycling, and transit ridership. These trends are interpreted with reference to relevant health and transportation studies. Chapter Two then illustrates levels of use for all modes across the City and County.



Photo Credit: Brianna Salmon

## OUR COMMUNITY

The City of Peterborough is the regional employment and shopping hub.

The City of Peterborough is located on the banks of the Otonabee River and has an urban population of 78,698 (Statistics Canada 2011 Census). Peterborough's land area is 64 square kilometers, extending 13.9 kilometers from north to south and 9 kilometers from east to west (City of Peterborough, 2012a). The City is situated within Peterborough County, which contains eight townships and two First Nations communities, and is home to approximately 54,000 persons (County of Peterborough 2013). The County of Peterborough is more than 4,000 square kilometers in size.

## LOCAL DETERMINANTS OF TRAVEL

This section will consider how the following factors influence travel in a local context:

- **AGE & GENDER**
- **INCOME & SPENDING**
- **EMPLOYMENT**
- **DISTANCE**
- **VEHICLE OWNERSHIP**
- **DENSITY & LAND-USE MIX**
- **WEATHER**

Reflecting on the local determinants of travel and demographic patterns in the Peterborough region will help to frame conversations around observed travel trends for all modes of transportation in the City and County of Peterborough, and can help to isolate the drivers and barriers that underlie those trends.

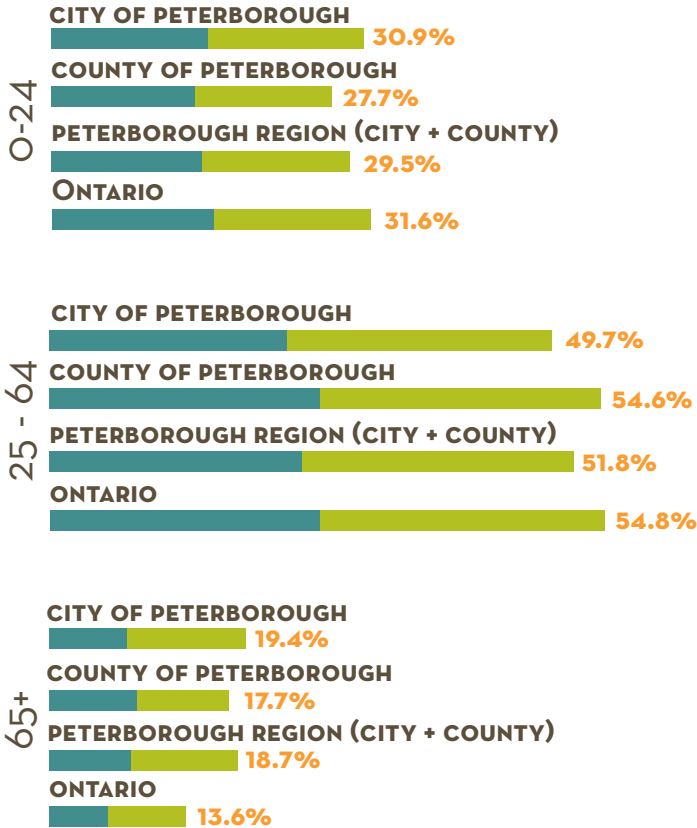


Photo Credit: Susan Sauvé



## POPULATION DEMOGRAPHICS

● MALE ● FEMALE



Source: Statistics Canada, 2006 Census

The City and County of have a higher proportion of individuals 65 years and older when compared to Ontario. Recent studies show that as licensed drivers get older, they tend to rely on their car for a higher number of trips than any other age group (Scott et al. 2009, Rosenbloom 2001, Pucher and Renne 2003). However, local statistics show that the proportion of licensed drivers in the City and County begins to decline at 65 years, with only 46% of women and 70% of men retaining their license after age 85. (Transportation Tomorrow Survey 2006). Additionally, many individuals 65 years and older confine their driving trips to daytime hours as a result of difficulty with their vision during low-light conditions (Rubin 1999). Self-imposed driving restrictions or the loss of a license can have a significant impact on the ability of an older adult to remain independent.

The presence of high-quality pedestrian infrastructure or transit services can reduce age-related travel inequities and can enhance mobility for seniors in the community.

MALES 15 - 25 YEARS ARE

**2X** 

MORE LIKELY TO BIKE  
THAN ANY OTHER  
DEMOGRAPHIC



Photo Credit: Rod Pierce

Studies also indicate that cycling levels decline with age (Winters et al. 2007, Heinen et al. 2010, Pucher et al. 1999, Dill and Voros 2007, Pucher and Renne 2003, Parkin et al. 2008, Pucher and Buehler 2008). In the City and County of Peterborough, commuters who are between 15 and 24 years old are the most likely demographic group to walk, cycle or ride transit on their trip to work.

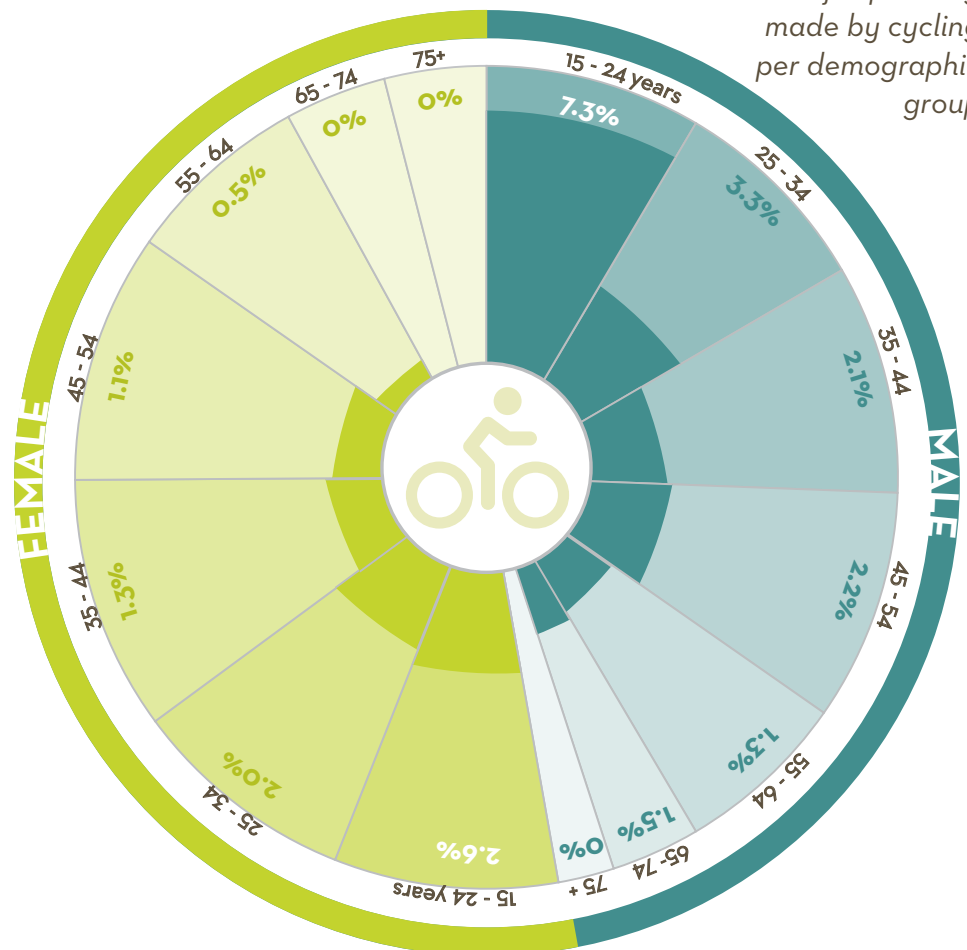
Within any age group, women are more likely than men to walk and ride transit, while men are more likely to commute by bicycle. Across North America, we see this trend repeated – men are, on average, more likely to commute by bicycle than women (Pucher and Buehler 2008, Sener et al. 2009, Winters et al. 2007). However, in communities where cycling is well established and there is an extensive cycling network, levels of cycling among women (Stinson and Bhat 2004, Garrard et al. 2008, Pucher and Buehler 2008) and people over 65 years (Sener et al. 2009, Pucher and Buehler 2008) are significantly increased, helping to narrow gaps in levels of use between genders and ages.

Across North America, recent trends have shown a decline in the percentage of young people obtaining their driver's license. A study from the University of Michigan found that a drop in younger licensed drivers occurred in more than half of the 15 countries studied, including Canada. Additionally, Schoettle and Sivak (2013) found that between 1999 and 2009, the number of licensed Canadian drivers between the ages of 16 to 54 years decreased. This study also concluded that the primary factors influencing an individual's decision to not obtain a license was increasing urbanization and the availability of alternative modes of transportation (Schoettle and Sivak 2013). Young people intending to get a license often cited vehicle ownership and maintenance costs as primary reasons for a delay in doing so (Schoettle and Sivak 2013).

## CYCLING TO WORK

### Peterborough City and County

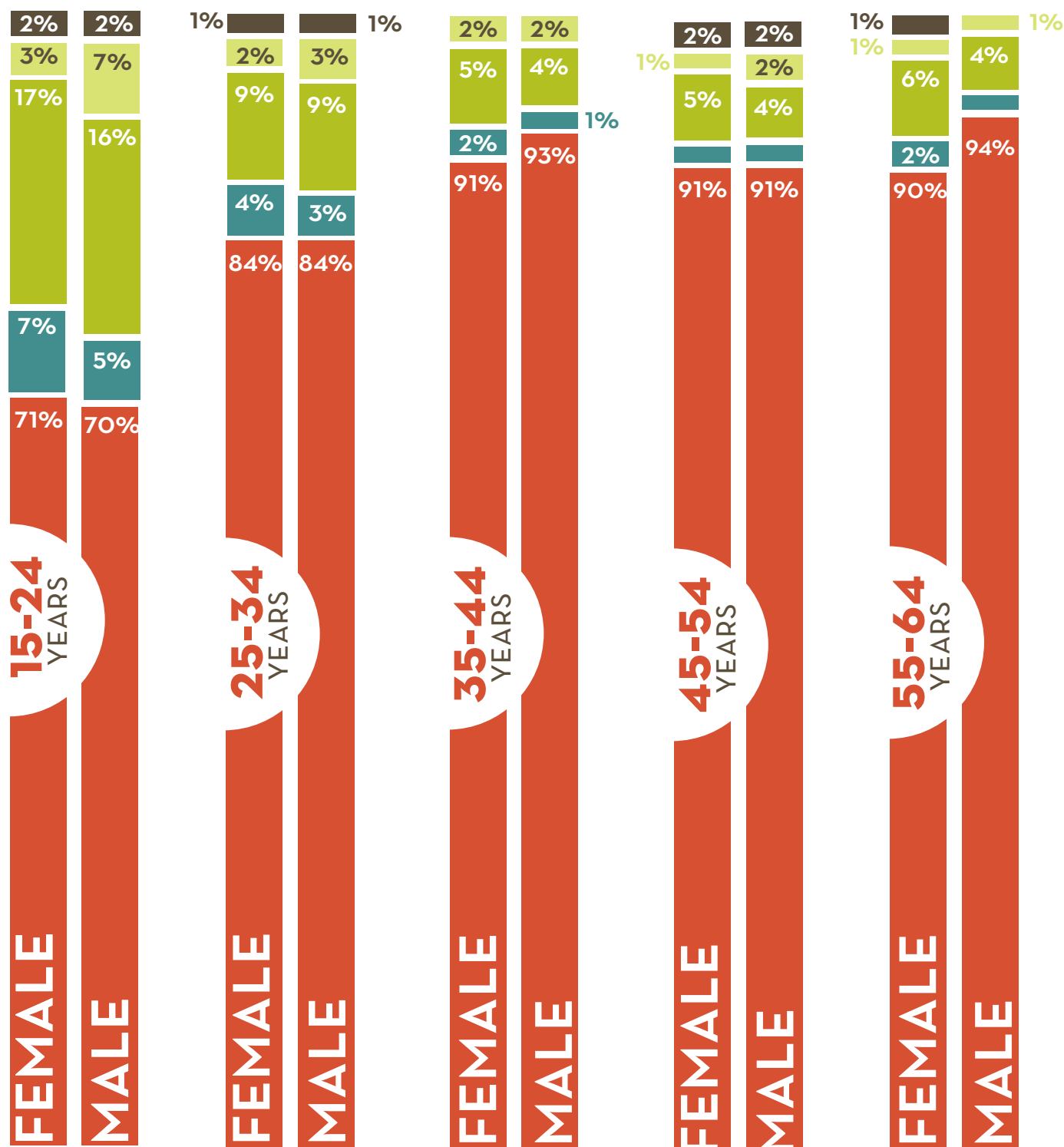
Share of trips being  
made by cycling  
per demographic  
group



# DEMOGRAPHIC TRAVEL TRENDS

## Peterborough City and County

% OF COMMUTE TRIPS MADE BY:



Source: Statistics Canada, 2006 Census



## INCOME & SPENDING

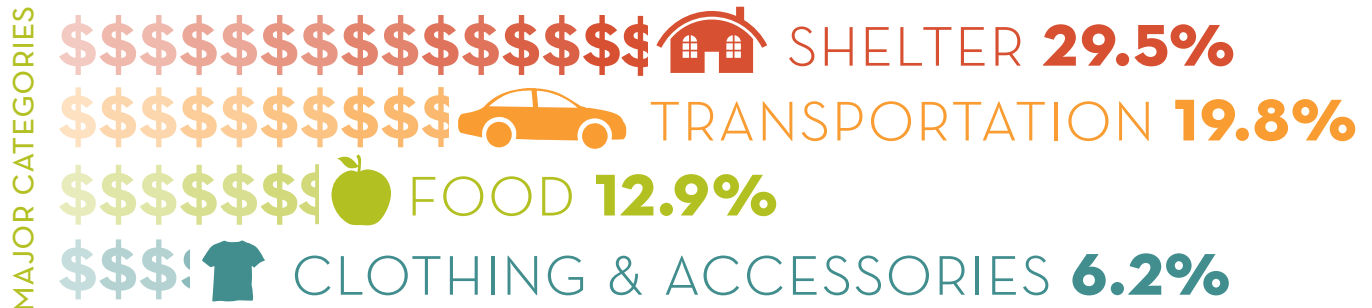
In Ontario, the average household spends nearly one-fifth of their income on transportation. Across Canada, 90% of that spending is dedicated to private transportation – primarily vehicles and their operating costs – while only 10% is spent on public transportation.

IN CANADA, HOUSEHOLDS  
SPENT AN AVERAGE OF:

# \$11,216

ON TRANSPORTATION IN 2012.

*Average household expenditures in Ontario (as % of overall income)*



Survey of Household Spending, Statistics Canada, 2012

## Transportation expenditures by income quintile

Average Canadian household income quintiles, before tax (average income within each quintile)

% of Peterborough City and County households that fall within each income quintile

Average percent spent on transportation

Average amount spent on transportation

<b>LOWEST</b> (\$29,921)	<b>18%</b>	<b>13.8%</b>	<b>\$4,129</b>
<b>SECOND</b> (\$43,507)	<b>21%</b>	<b>16.0%</b>	<b>\$6,961</b>
<b>THIRD</b> (\$64,008)	<b>19%</b>	<b>17.2%</b>	<b>\$11,009</b>
<b>FOURTH</b> (\$88,061)	<b>23%</b>	<b>16.0%</b>	<b>\$14,090</b>
<b>HIGHEST</b> (\$151,506)	<b>19%</b>	<b>13.1%</b>	<b>\$19,847</b>

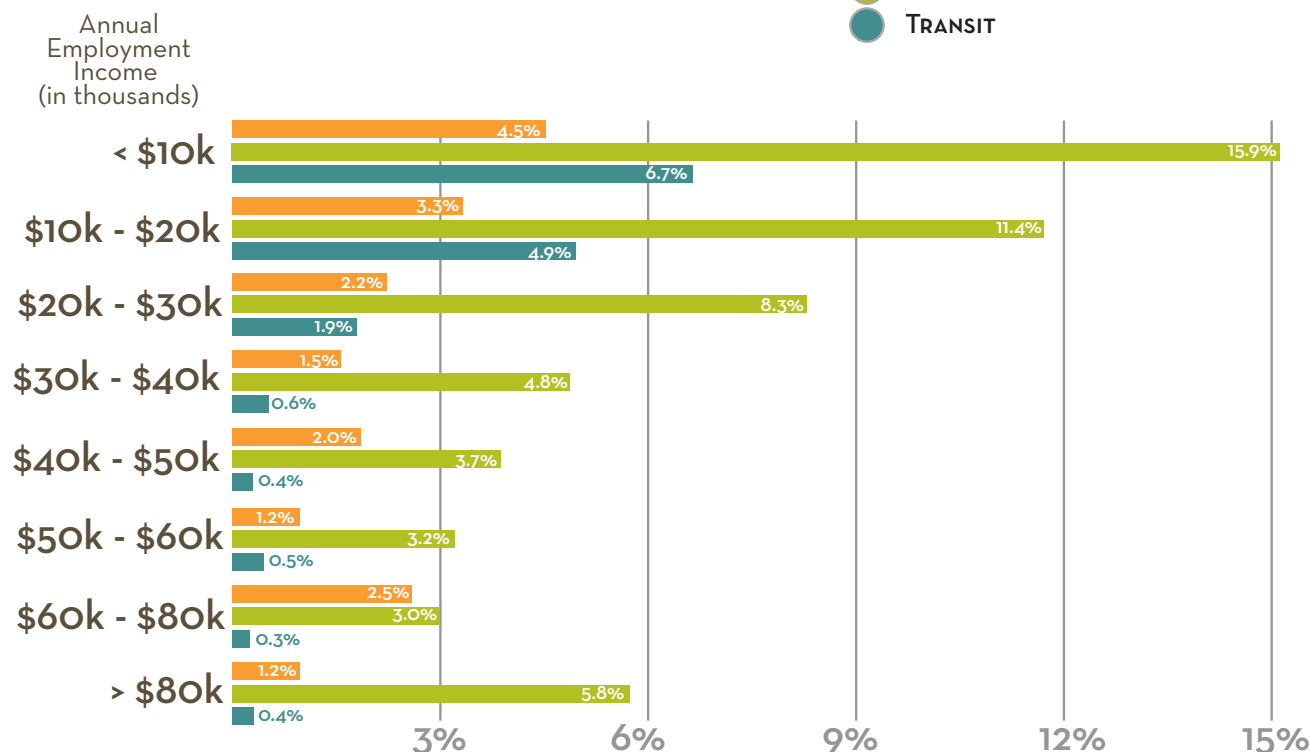
Survey of Household Spending, Statistics Canada, 2012  
National Household Survey, Statistics Canada, 2011

# INCOME & TRAVEL BEHAVIOUR

## City of Peterborough

% OF EMPLOYED PERSONS,  
OVER 15 YEARS, USING EACH MODE:

- CYCLING
- WALKING
- TRANSIT



Persons who earn less than the city-wide median employment income (\$29,980 in 2006 dollars) are:

**3x** more likely to walk,  
**2x** more likely to bike, and  
**10x** more likely to ride transit  
 on the trip to work than those persons earning more than the median.

A study of Ontario municipalities found that the Greater Peterborough Area (City and County) has a relatively low average income (GPA EDC 2010). Census information shows that for people living in the City of Peterborough, there is a strong connection between annual employment income and how a person travels to and from work. People who make less than \$10,000 per year are the most likely group to walk, bike, or ride transit to work when compared to individuals in other income brackets. Additionally, people who earn less than the City's median income are three times more likely to walk, two times more likely to bike, and ten times more likely to ride transit.

Source: Statistics Canada, 2006 Census

Notes: Employment income refers to total income received by persons 15 years of age and over during calendar year 2005 as wages and salaries, net income from a non-farm unincorporated business and/or professional practice, and/or net farm self-employment income. These figures are before tax.

In the City of Peterborough, the use of public transit is found to be closely tied to income (Statistics Canada 2006 Census). The relationship between income and active transportation is not as predictable as transit use. Generally, local statistics show that the percentage of people walking to work decreases as income increases; however, for persons in the highest income bracket, there are unexpectedly high rates of walking. This may be because people within this income bracket have the financial flexibility to live closer to their work when compared to people whose housing budget is more restricted. Alternatively, this local trend may reflect the proximity of some of Peterborough's higher income neighborhoods (such as the Old West End and The Avenues) to the downtown. Cycling is also linked with income level; however, in recent years there has been a surge in cycling to work among individuals who make between \$60,000 and \$80,000 per year. This growth reflects trends observed across North America, where middle aged, moderate-to-high income men are the fastest growing demographic of bicycle commuters (Pucher, et al. 2011).



IN THE CITY OF PETERBOROUGH, IN 2011...

A PERSON  
LIVING ALONE WAS  
CONSIDERED LOW  
INCOME IF THEY  
EARNED LESS THAN

**\$16,328**  
AFTER TAX

IF A PERSON EARNING \$16,328  
BOUGHT A MONTHLY  
TRANSIT PASS FOR A YEAR\*,  
IT WOULD REQUIRE...

\*Based on the cost of  
monthly transit pass in 2011

**4.0%**  
OF THEIR EARNINGS

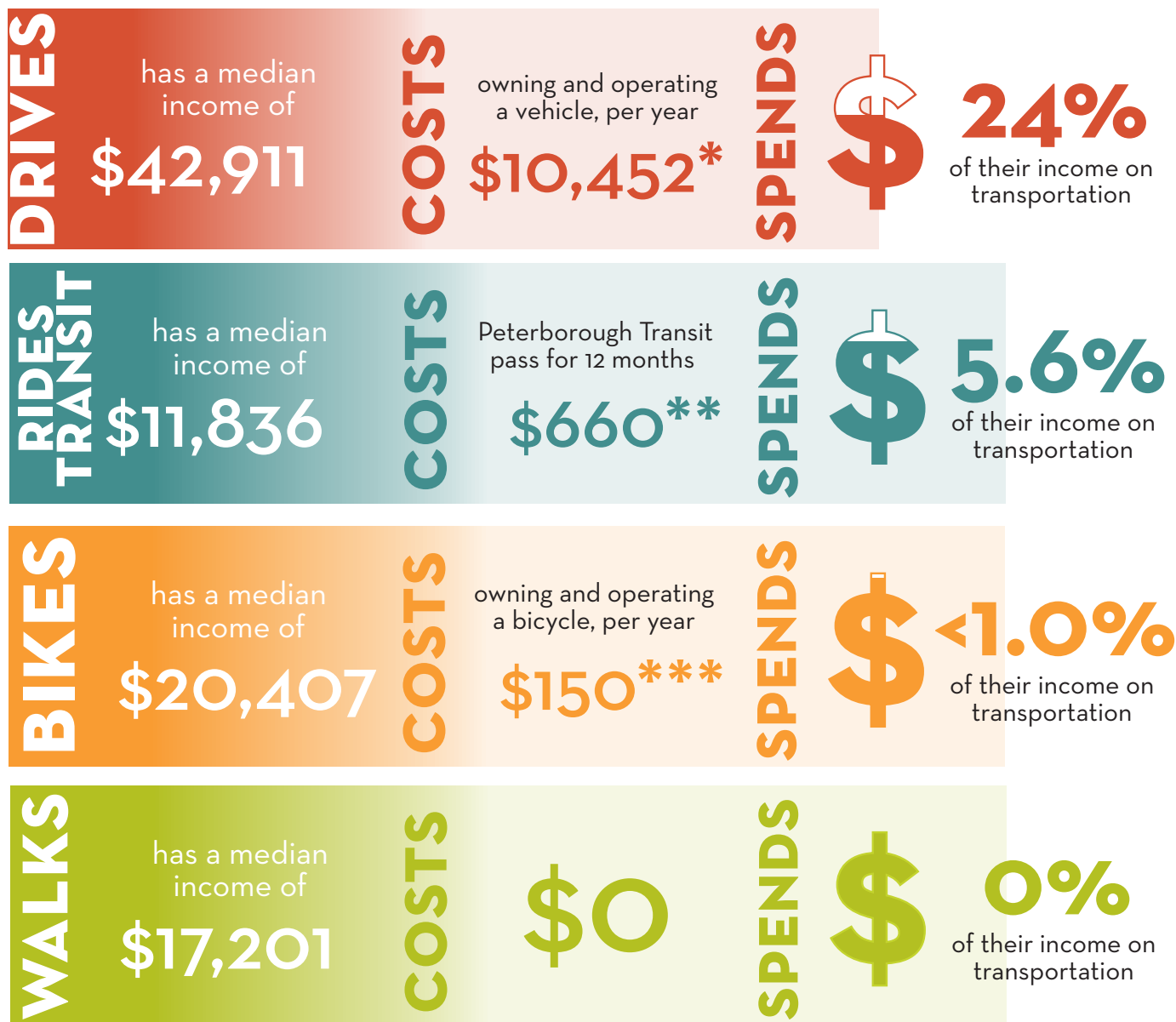
National Household Survey,  
Statistics Canada, 2011  
City of Peterborough, 2011

Photo Credit: Brianna Salmon

# CONSUMER SPENDING ON TRANSPORTATION

City of Peterborough

*In 2011, a commuter who...*



Sources: Statistics Canada, 2006; \* Canadian Automobile Association, 2012; \*\* City of Peterborough, 2011; and, \*\*\* Share the Road, 2010

Notes: Based on the average employed person, 15 years and over, having a usual place of work. All numbers have been adjusted to 2011 figures using the Employment and Social Development Canada average income growth, by income bracket, between 2006 -2011

# INCOME & TRAVEL BEHAVIOUR

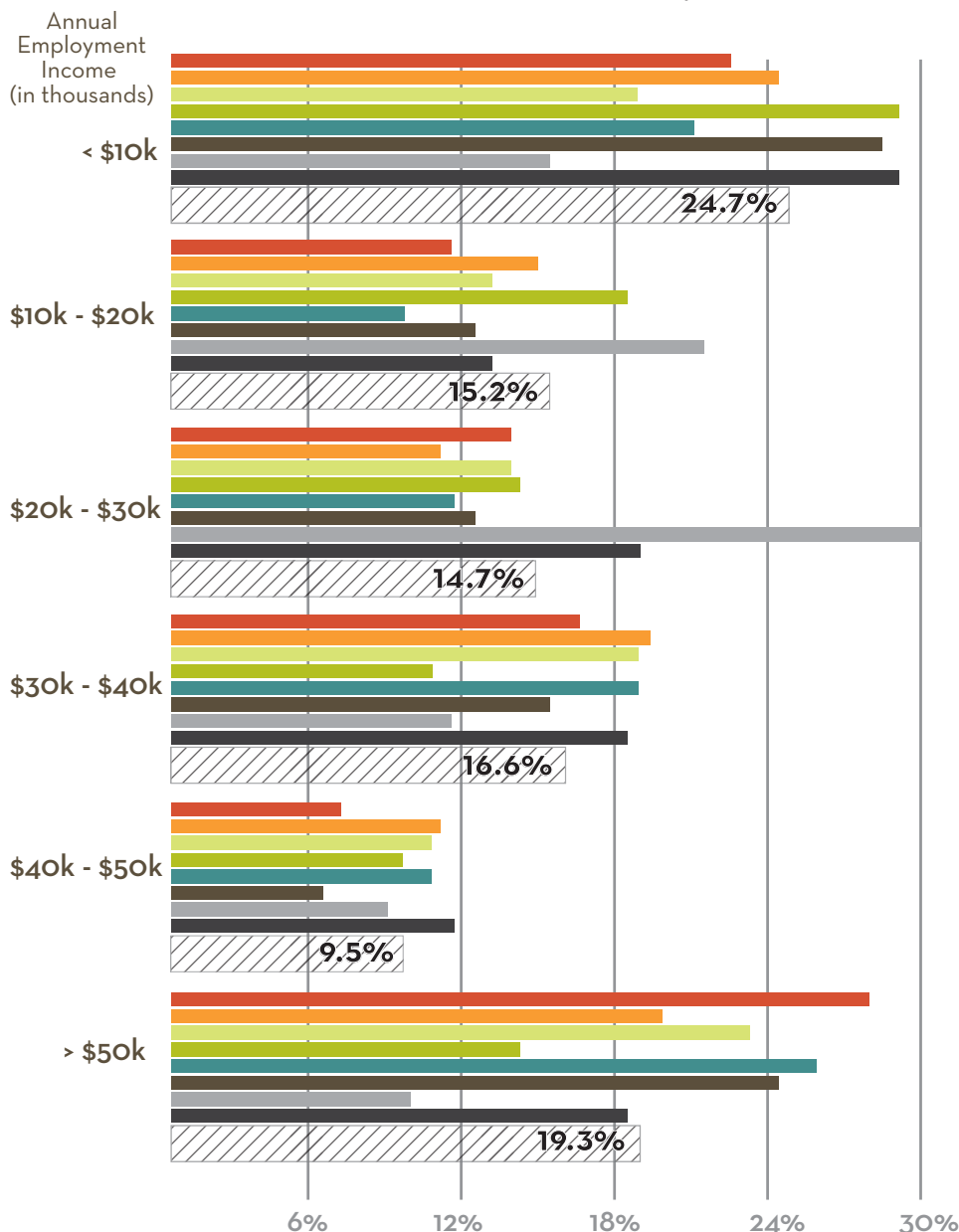
## County of Peterborough

% OF EMPLOYED PERSONS,  
OVER 15 YEARS, IN EACH TOWNSHIP:

- Asphodel-Norwood
- Otonabee-South Monaghan
- Cavan Monaghan
- Selwyn
- Douro-Dummer
- Havelock-Belmont-Methuen
- North Kawartha
- Trent Lakes
- County of Peterborough Average

There is insufficient data available to assess relationships between income and travel behaviour in the County. However, a review of income data reveals that over 50% of the County's population earns less than \$30,000 each year. According to the Canadian Automobile Association, the cost of owning and operating a vehicle is approximately \$10,452 per year. Knowing this cost provides insight into the number of County residents who may not have the financial resources to own and operate a vehicle. In rural and semi-rural settings, where there is typically limited or no transit service available and minimal infrastructure that supports active transportation, County residents without access to a vehicle are at a

disadvantage relative to their City counterparts who can access employment and services using alternative modes of transportation. Because of this, transportation equity in the County is strongly linked to income.



Source: Statistics Canada, 2006 Census

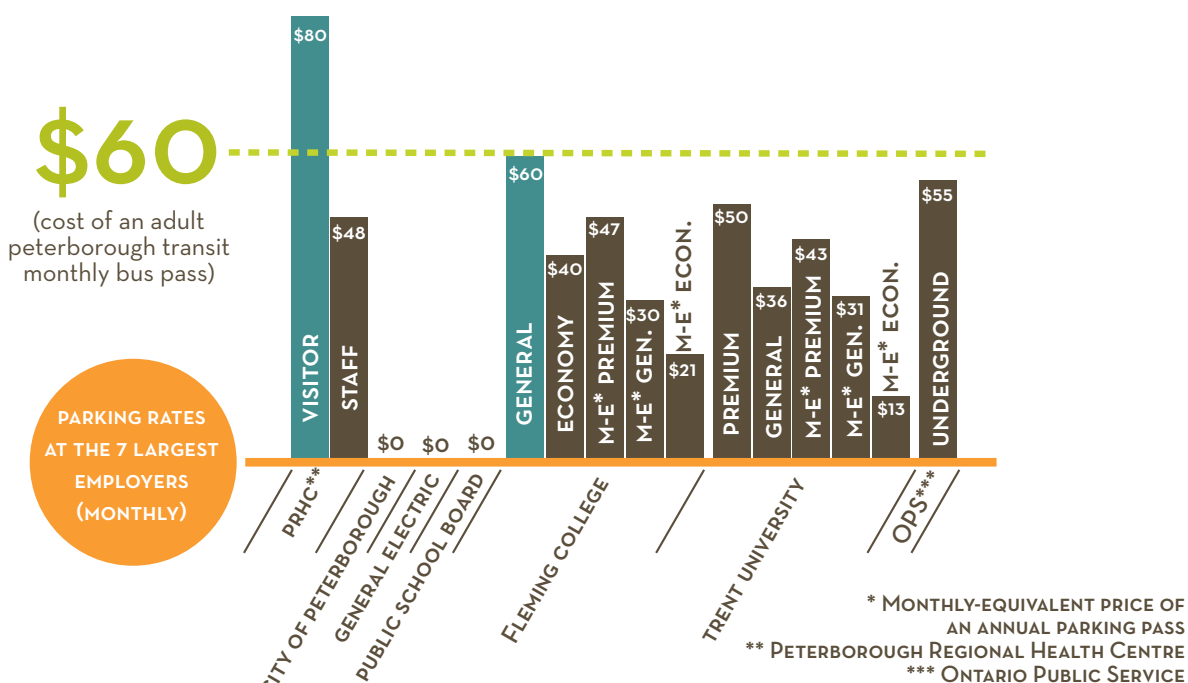
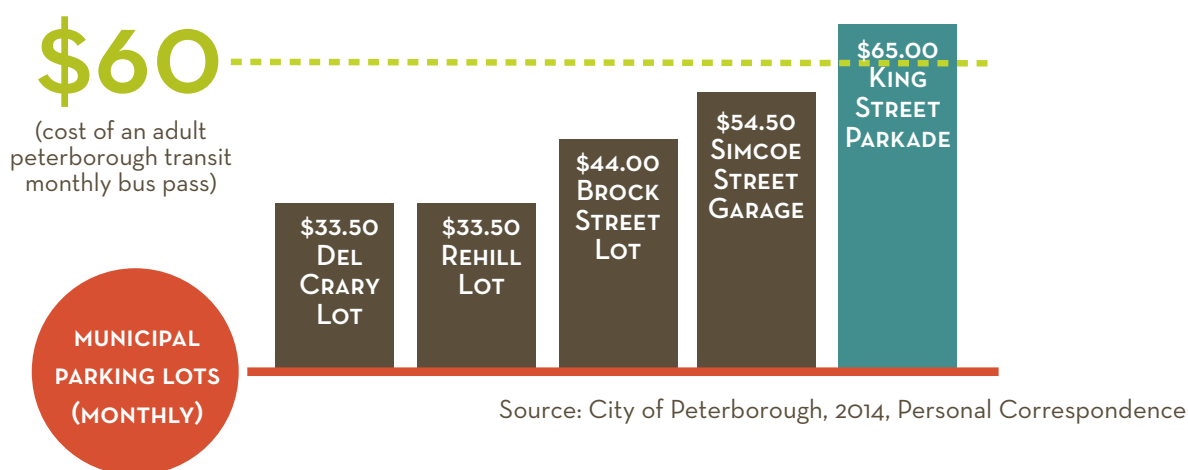
Notes: Employment income refers to total income received by persons 15 years of age and over during calendar year 2005 as wages and salaries, net income from a non-farm unincorporated business and/or professional practice, and/or net farm self-employment income. These figures are before tax.



# TRANSIT PASS RELATIVE TO PARKING COSTS

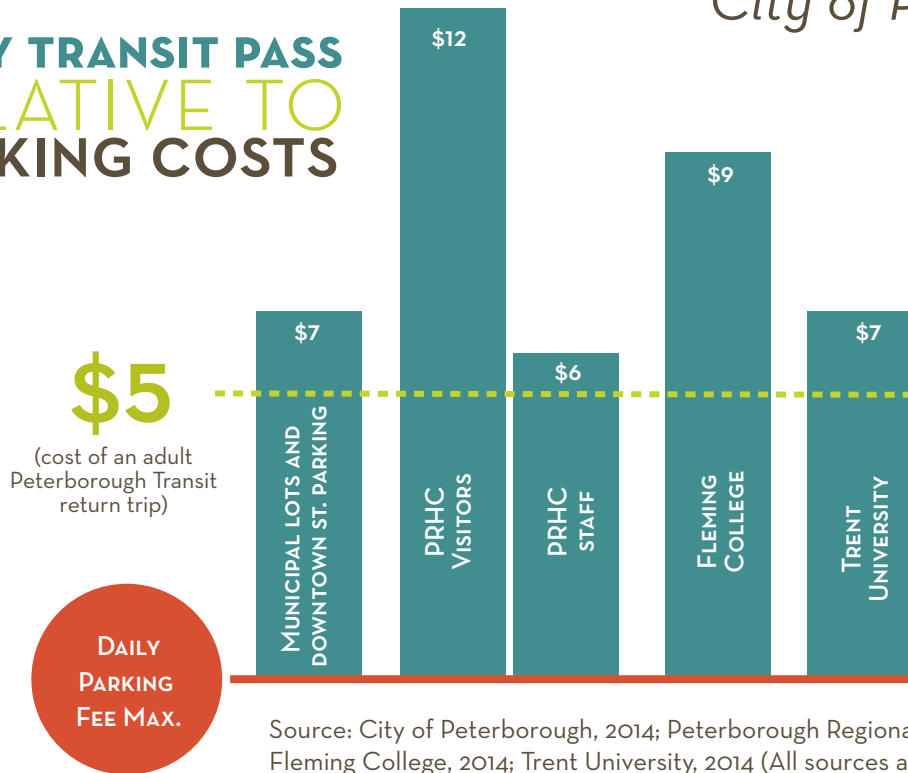
City of Peterborough

Owning a vehicle is associated with many costs, and parking fees is one of the most commonly recognized. The immediate out-of-pocket costs associated with parking are often used to compare the perceived cost-effectiveness of transit. In the downtown core, monthly parking passes at four of five municipally-owned parking lots are less than the cost of a monthly transit pass. For persons who work at one of Peterborough's seven largest employers, monthly parking passes are also less than the cost of a monthly transit pass. However, for persons visiting these institutions on a less frequent basis, the cost of a daily parking pass relative to the cost of an adult return trip on Peterborough Transit appears more favourable, with parking costs ranging from \$6 to \$12 per day and a two-way adult return transit ticket costing only \$5.



Source: City of Peterborough, 2014; Peterborough Regional Health Centre, 2014; General Electric, 2014; Kawartha Pine Ridge District School Board, 2014; Fleming College, 2014; Trent University, 2014; Ontario Public Service, 2014 (All sources are Personal Correspondence)

## DAILY TRANSIT PASS RELATIVE TO PARKING COSTS



## EMPLOYMENT

The type of job someone has and whether they work part-time or full-time has an impact on their mode of travel. Part-time employees earn less than full-time employees and thereby tend to walk, cycle or use transit more often.

Additionally, individuals who are required to travel great distances for work, such as real estate agents, or employees who may be required to transport goods, such as those working in the construction sector, are among the least likely to walk, cycle or use transit



Photo Credit: Susan Sauvé

# EMPLOYMENT CLASSIFICATION, TYPE & TRAVEL BEHAVIOUR

City of Peterborough

*In 2006,*

PART TIME EMPLOYEES WERE



**1.6x**

MORE LIKELY TO RIDE TRANSIT  
THAN FULL-TIME EMPLOYEES

&

PART TIME EMPLOYEES WERE



**1.8x**

MORE LIKELY TO WALK OR BIKE  
THAN FULL-TIME EMPLOYEES

HOWEVER, THE DIFFERENCE BETWEEN FULL-TIME AND PART-TIME  
EMPLOYEE TRAVEL BEHAVIOUR HAS BEEN NARROWING.

*In 1996,*

PART TIME EMPLOYEES WERE



**2.9x**

MORE LIKELY TO RIDE TRANSIT  
THAN FULL-TIME EMPLOYEES

&

PART TIME EMPLOYEES WERE



**2.5x**

MORE LIKELY TO WALK OR BIKE  
THAN FULL-TIME EMPLOYEES

Source: Transportation Tomorrow Survey, 1996 & 2006

EMPLOYEES IN THE FOLLOWING  
SECTORS ARE THE MOST LIKELY TO:

- Retail
- Accommodation & Food Services
- Educational Services



EMPLOYEES IN THE FOLLOWING  
SECTORS ARE THE LEAST LIKELY TO:

- Real Estate
- Finance & Insurance
- Manufacturing

- Accommodation & Food Services
- Administrative & Support Services
- Information & Cultural Industries



- Transportation & Warehousing
- Finance & Insurance
- Construction



Source: Statistics Canada, 2006 Census

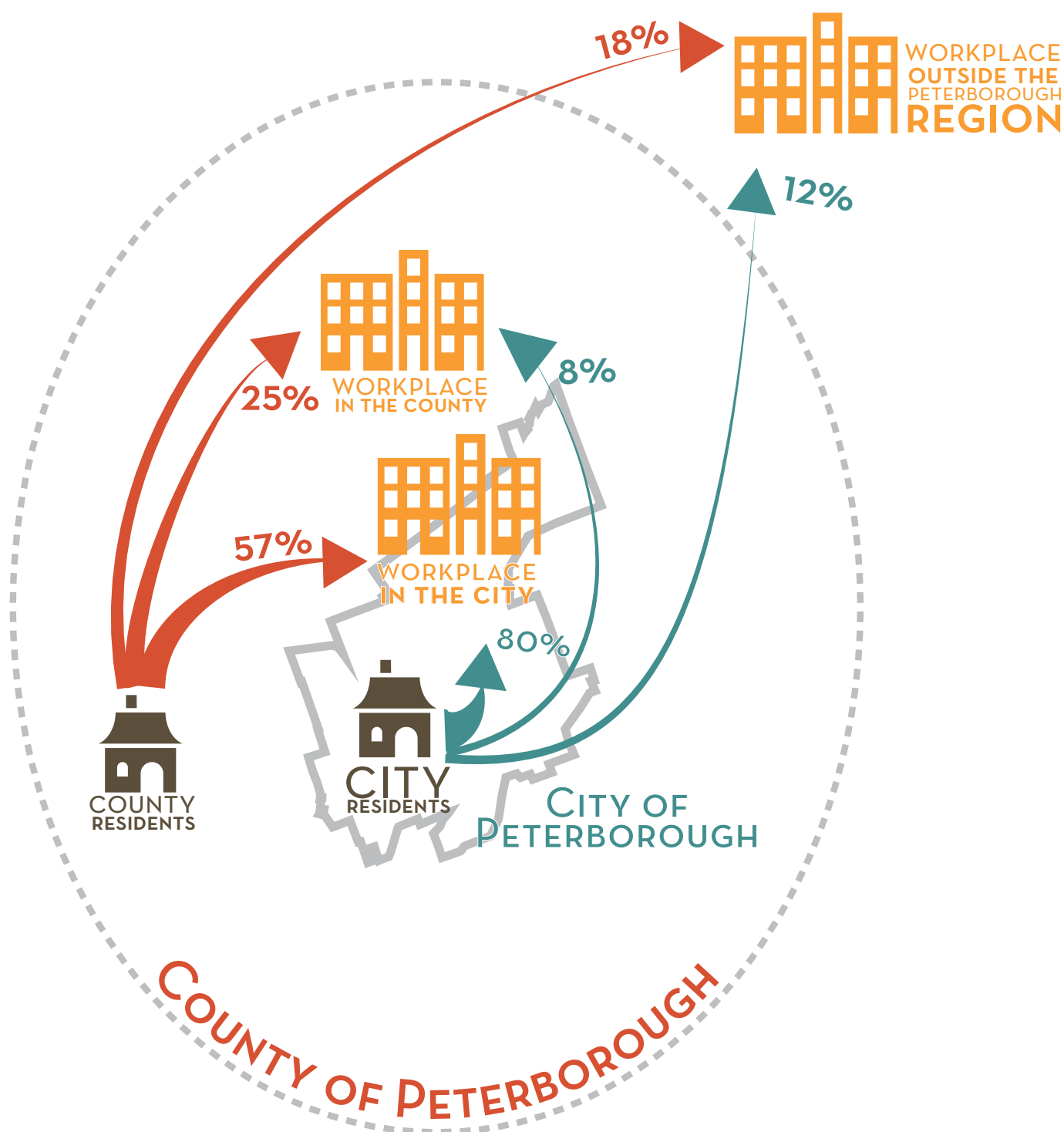




Photo Credit: PCCHU

# WHERE WE TRAVEL FOR WORK

 Travel destinations for City of Peterborough residents  
 Travel destinations for County of Peterborough residents



Source: Transportation Tomorrow Survey, 2006

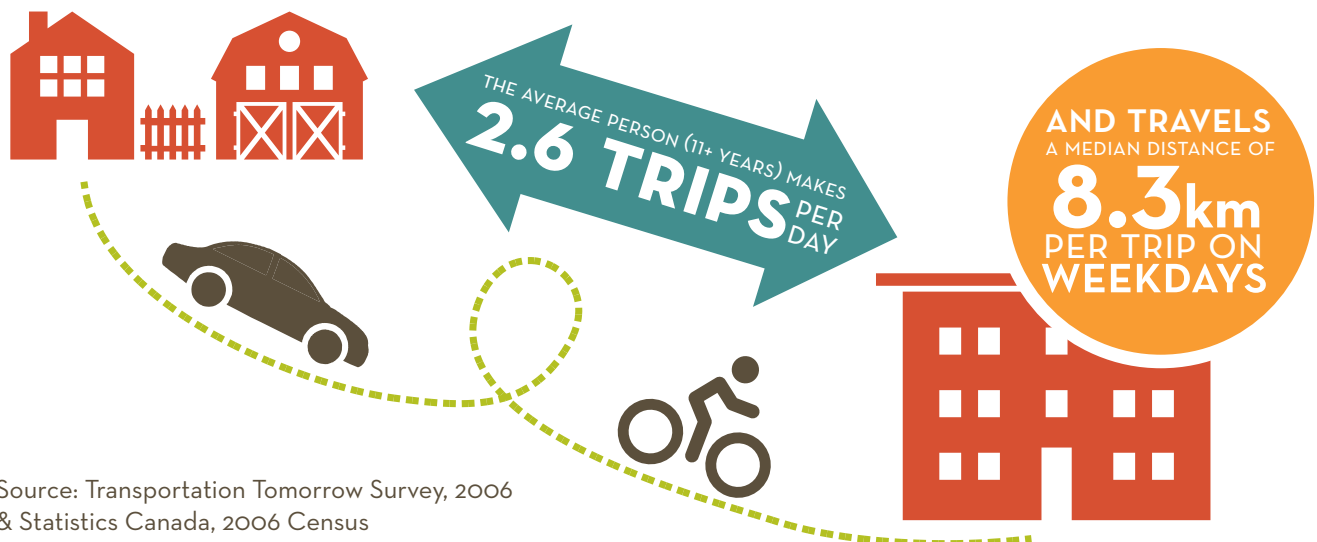


The distance between the start and end point of a trip can be a major deterrent to using active transportation (Pucher and Buehler 2006, Parkin et al. 2008, Stinson and Bhat 2004, Sener et al. 2009, Dill 2009, Gatersleben and Appleton 2007). For residents in the City and County of Peterborough, the average person makes slightly fewer than 3 trips per day. However, in the City, those trips are an average distance of 2.7 kilometers on weekdays, while in the County the average weekday trip distance is 8.3 kilometers. The average trip distance in the City is significantly smaller than the County due to the proximity of amenities as well as the fact that 80% of City residents work in the City.

## City of Peterborough



## County of Peterborough



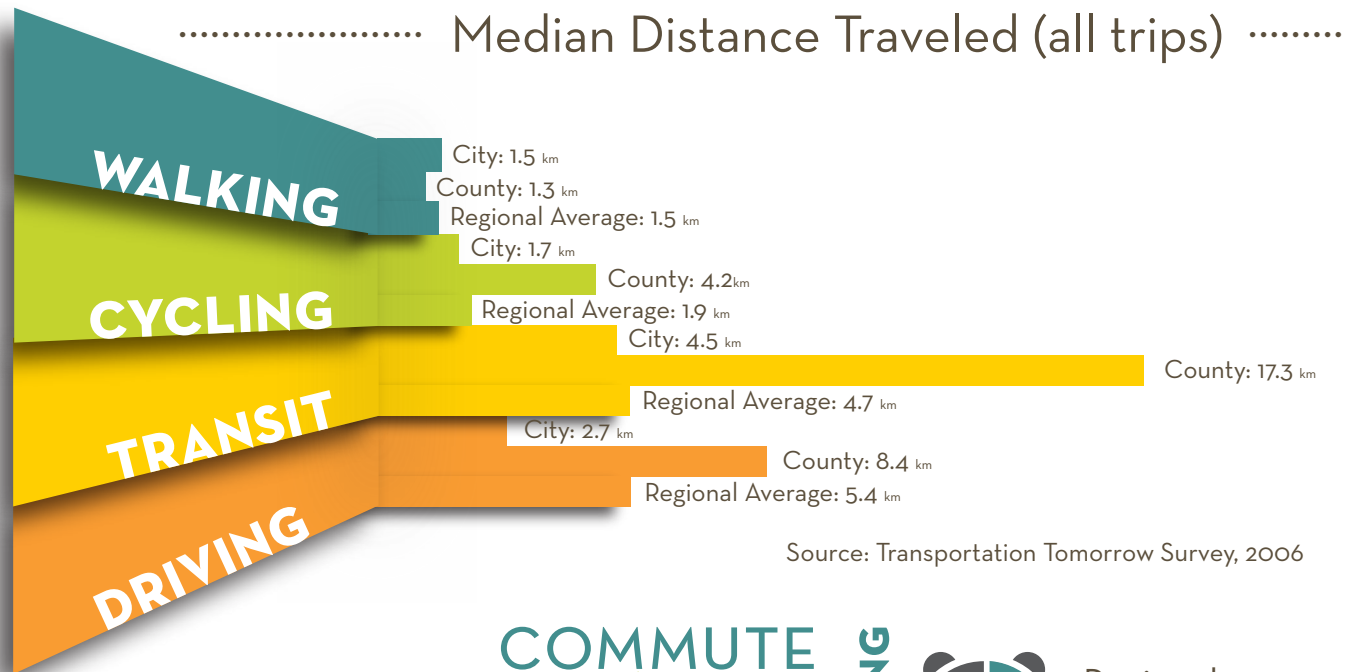
Source: Transportation Tomorrow Survey, 2006  
& Statistics Canada, 2006 Census



Photo Credit: PCCHU

# COMMUNITY TRIP DISTANCE

## City & County of Peterborough



Source: Transportation Tomorrow Survey, 2006

Across the Peterborough region, the average distance traveled using active transportation is less than the average distance traveled by bus or driving. In the County of Peterborough, where transit service is only available between towns rather than within towns, the average distance traveled by bus is very high relative to other modes of travel. For work trips, average commute times are also largely a function of the distance traveled, although travel speed and traffic congestion are influencing factors. The average commute time for walkers is the lowest, however their distance traveled is also quite short. For persons riding transit and cycling, overall travel speed is almost equivalent, although persons cycling generally cover less distance door-to-door and therefore have shorter commute times. The higher travel time for transit users may contribute to a lower share of commute trips being made by transit in the City of Peterborough.

# COMMUTE TRAVEL TIME

WALKING



Regional average:  
**15** minutes  
(average distance covered:  
1.25 km at 5 km/hr)

CYCLING



Regional average:  
**20** minutes  
(average distance covered:  
5 km at 15 km/hr)

TRANSIT



Regional average:  
**37** minutes  
(average distance covered:  
10.5 km at 17 km/hr)

DRIVING



Regional average:  
**22** minutes  
(average distance covered:  
14.5 km at 40 km/hr)

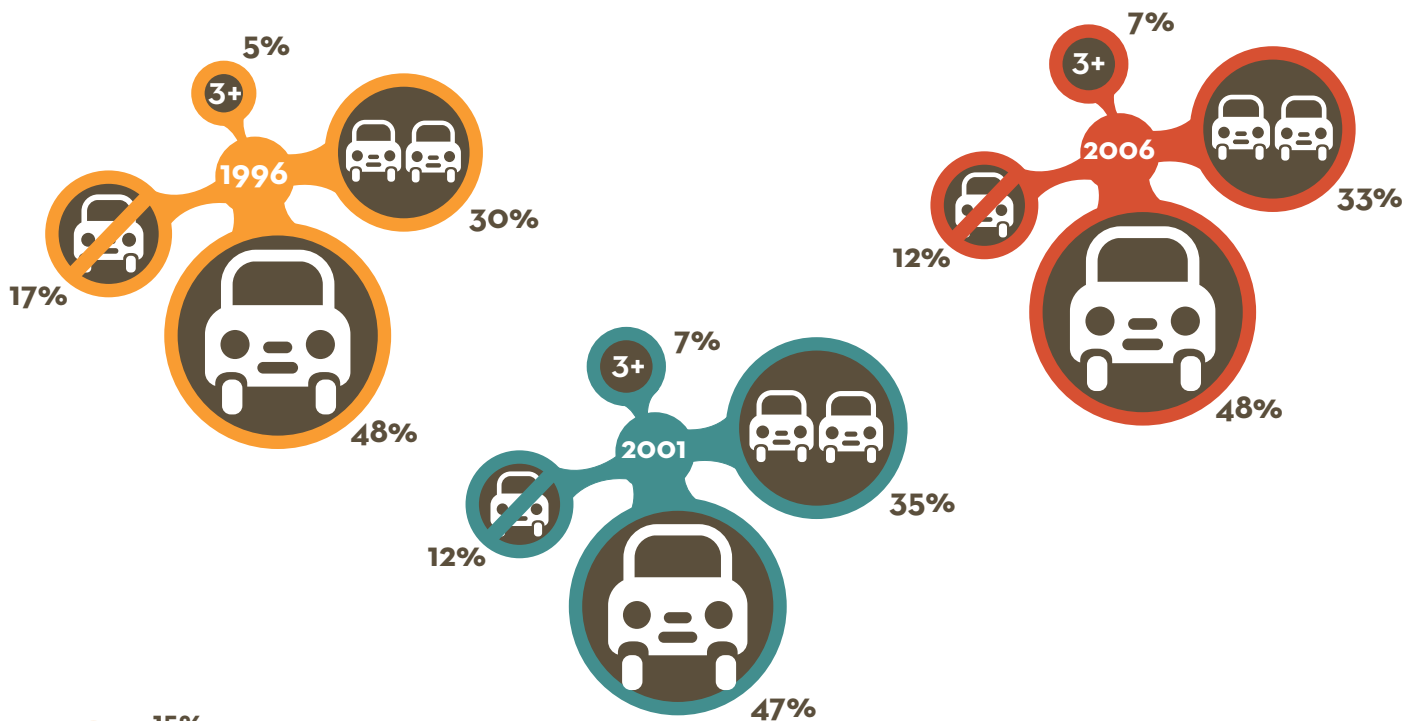
Source: Statistics Canada, 2006 Census

## VEHICLE OWNERSHIP

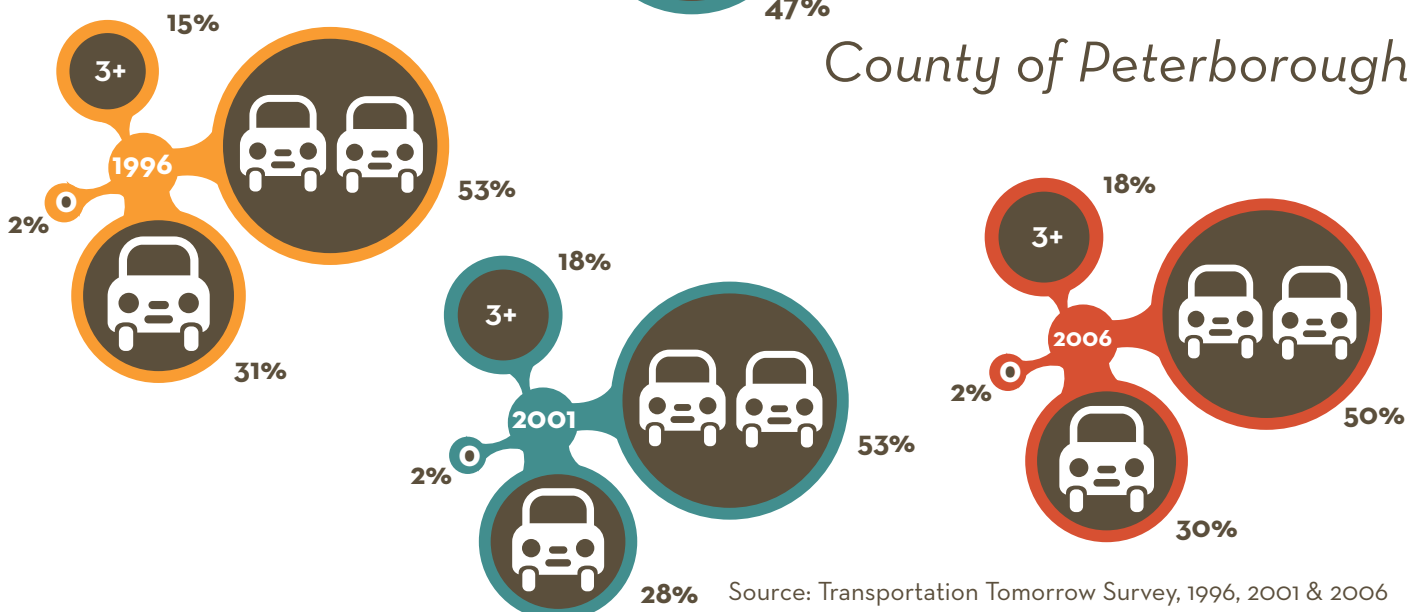
In the City and County of Peterborough, the majority of households own one or two vehicles - a trend that has remained fairly constant over the past two decades. Consistently, statistics show that the more vehicles a household owns, the less likely those residents are to walk or cycle for transportation. In the County, there is also a notable decrease in rates of carpooling as vehicle ownership increases. When a household purchases one vehicle, carpool trips drop by 30% and then drop an additional 10% after the purchase of a second.

### VEHICLE OWNERSHIP

#### City of Peterborough

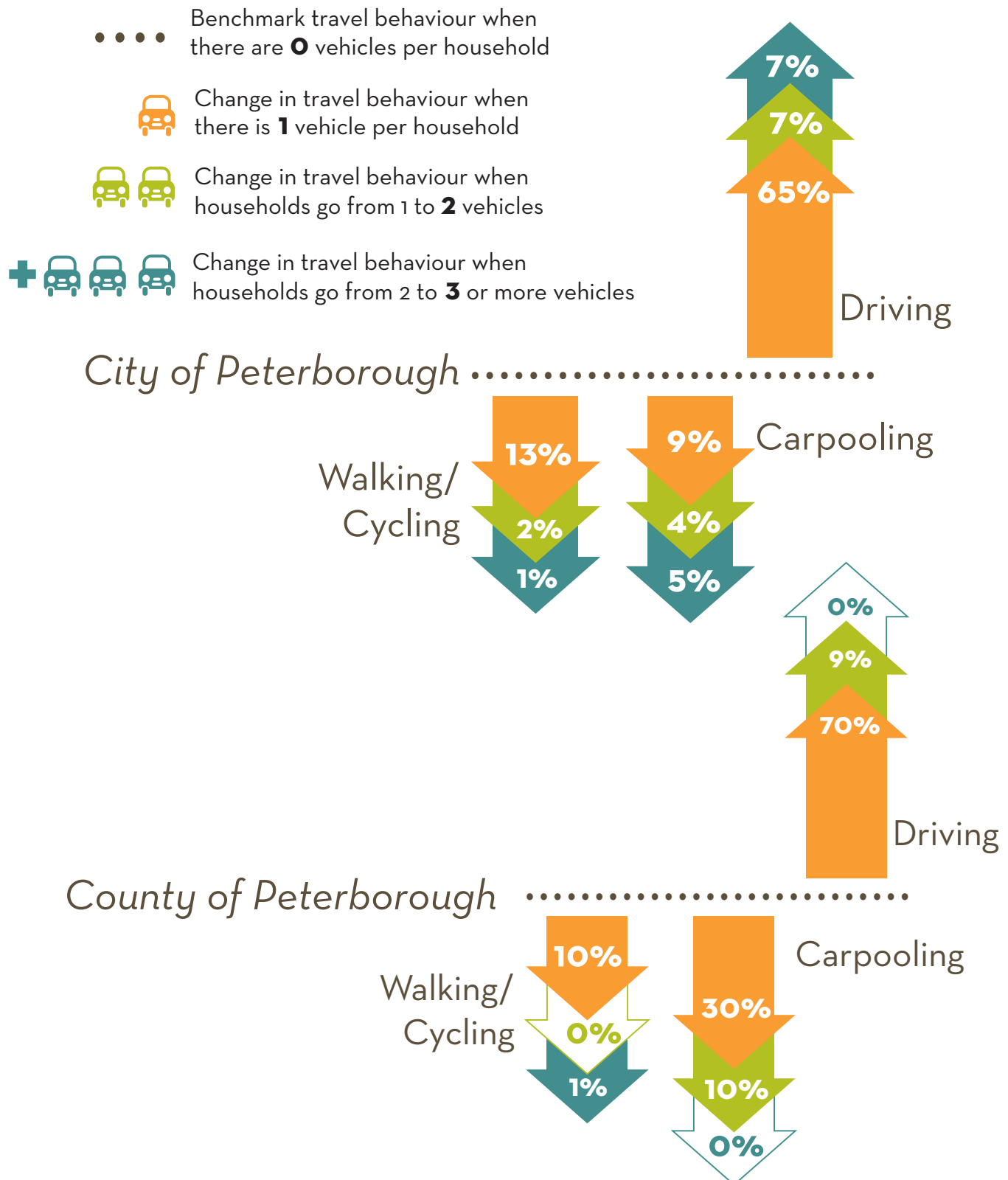


#### County of Peterborough



Source: Transportation Tomorrow Survey, 1996, 2001 & 2006

# VEHICLE & OWNERSHIP TRAVEL BEHAVIOUR



Source: Transportation Tomorrow Survey, 2006





Photo Credit: Susan Sauvé



## DENSITY & LAND USE MIX

The way a community is designed and built dictates the possibility of active transportation. Low-density, single-use, vehicle-dependent communities make walking and cycling between destinations time consuming and unrealistic for many people. To encourage use of alternative modes of travel, communities should be built with all amenities and services within a comfortable walking distance. While this may seem self-evident, low-density single-use suburban developments that often require people to drive to their destinations are still very much the norm in communities across North America, including Peterborough.

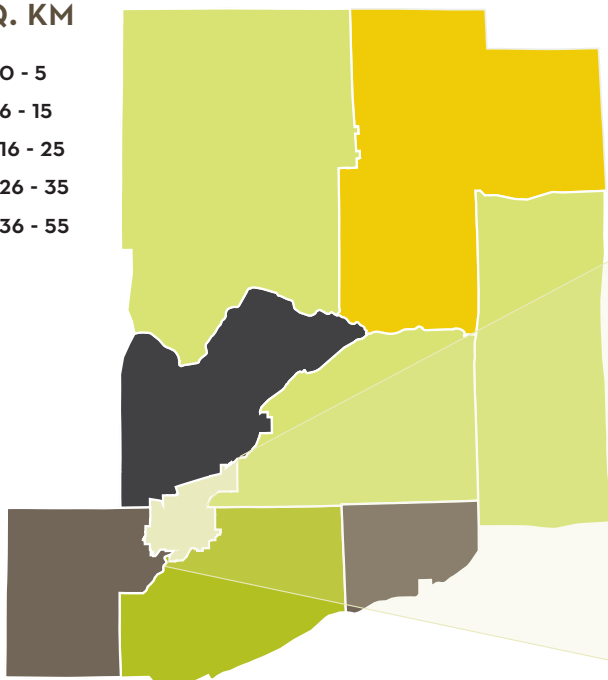
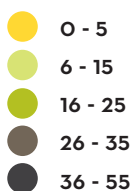
Communities across the world are, however, starting to redesign their cities with walkability in mind. And, in areas with higher densities and mixed land uses, rates of walking and cycling are shown to be higher (Dill and Carr 2003, Parkin et al. 2008; Winters et al. 2007, Bonham and Koth 2010, Brandenburg et al. 2007).

The County has low population densities, which is characteristic of rural areas. The City, on the other hand, has high/medium densities in the downtown core and lower densities in the peripheries (Statistics Canada, 2006 Census).

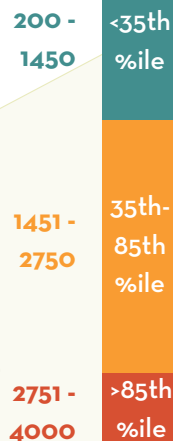
## POPULATION DENSITY

### COUNTY DENSITY

PEOPLE/  
SQ. KM

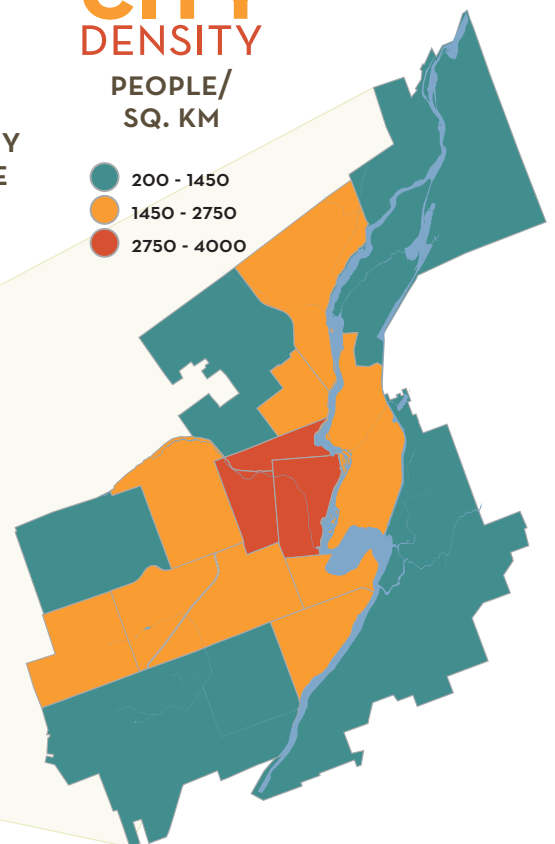
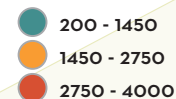


DENSITY  
RANGE



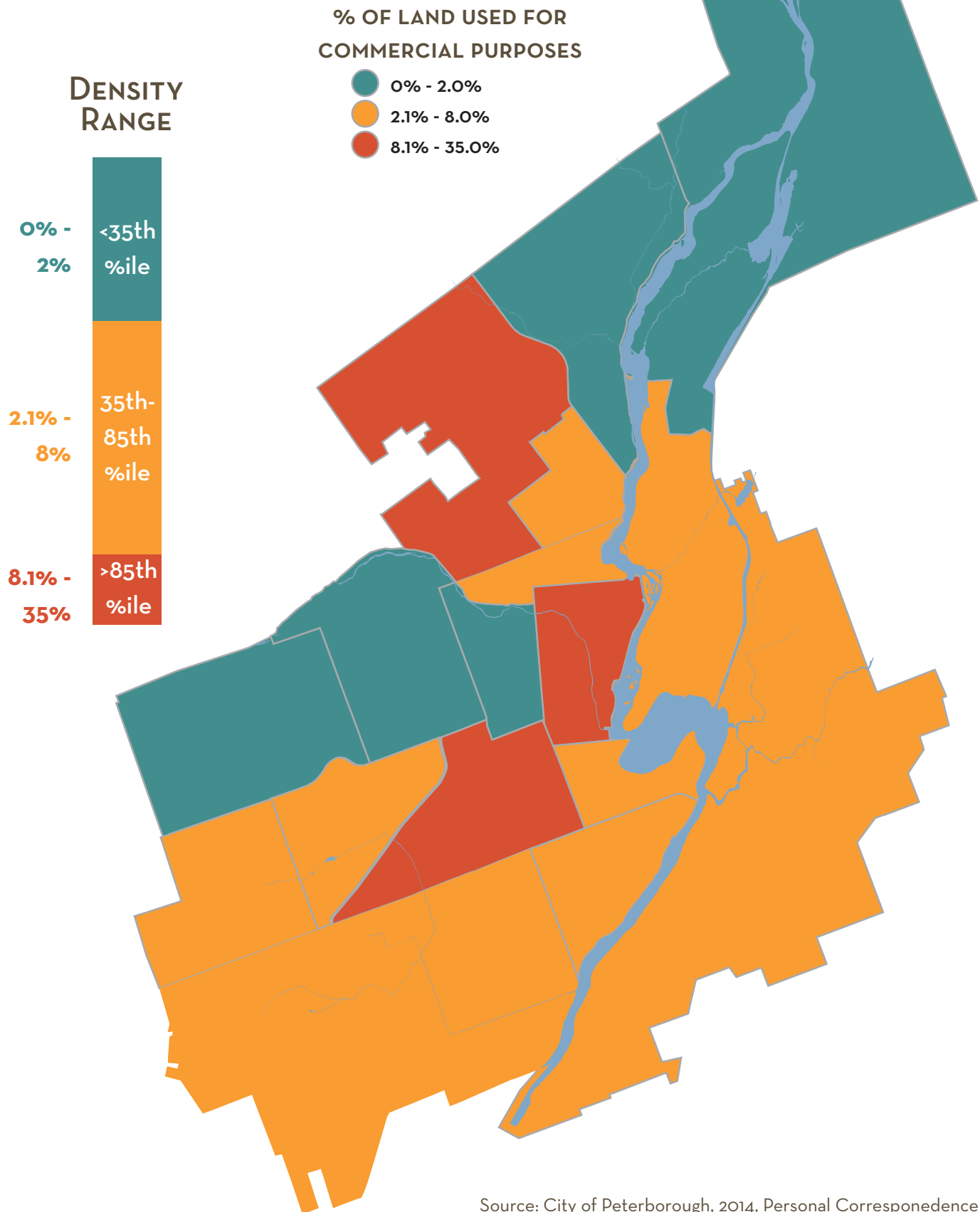
### CITY DENSITY

PEOPLE/  
SQ. KM



# COMMERCIAL DENSITY

City of Peterborough



Source: City of Peterborough, 2014, Personal Correspondence

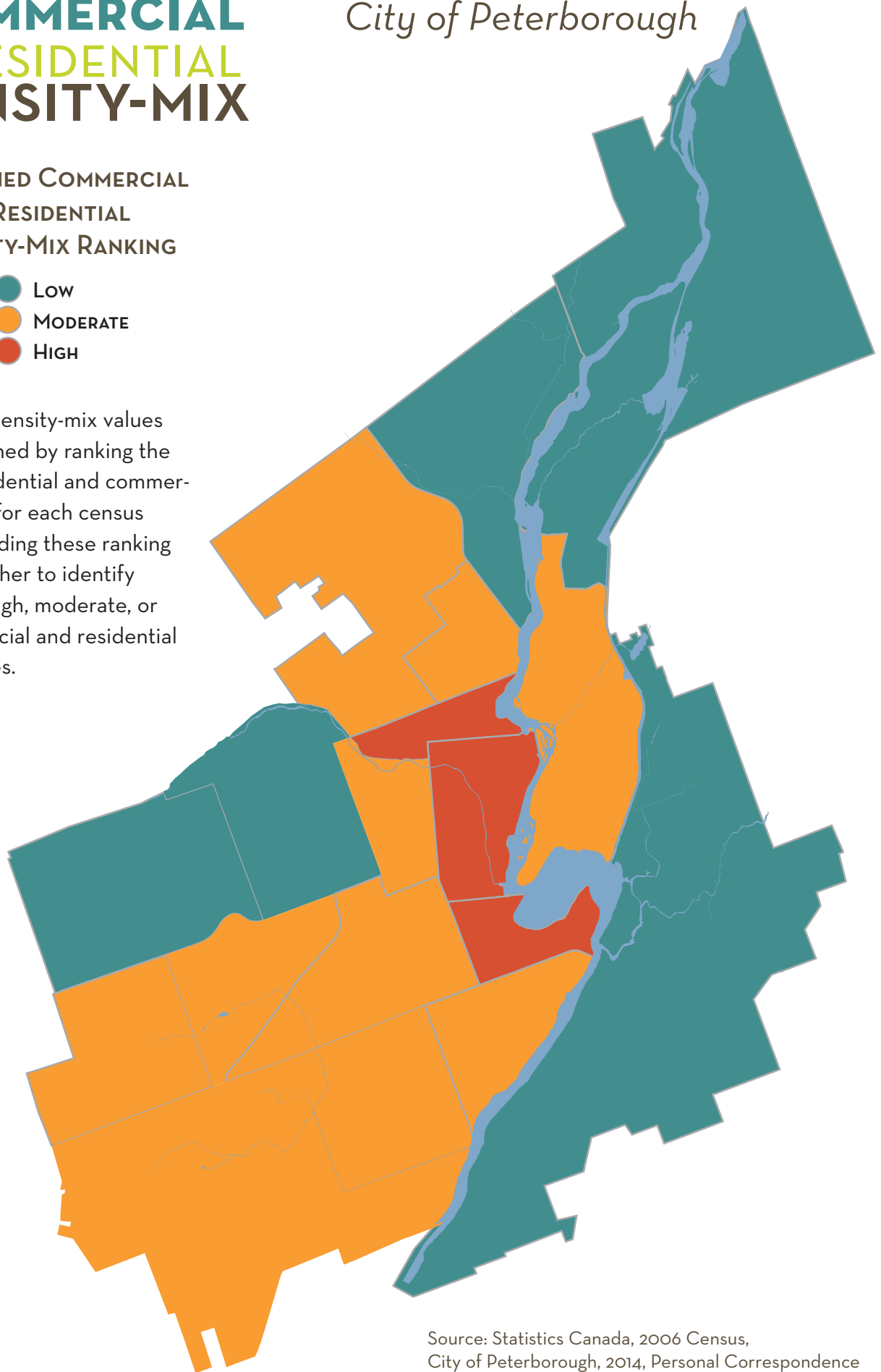
# COMMERCIAL & RESIDENTIAL DENSITY-MIX

*City of Peterborough*

## COMBINED COMMERCIAL & RESIDENTIAL DENSITY-MIX RANKING

- Low
- MODERATE
- High

Combined density-mix values are determined by ranking the relative residential and commercial density for each census tract and adding these ranking scores together to identify areas with high, moderate, or low commercial and residential density mixes.



Source: Statistics Canada, 2006 Census,  
City of Peterborough, 2014, Personal Correspondence

Based on findings from other communities (Glazier et al. 2014), mixed-use density ratings (e.g., high residential and commercial densities) should correspond to higher rates of active transportation. With the exception of two areas, density and land-use mix are an accurate predictor of active transportation rates in the City. This finding has significant implications for future land use planning in the City of Peterborough.

## DENSITY-MIX AS AN INDICATOR OF ACTIVE TRANSPORTATION USE

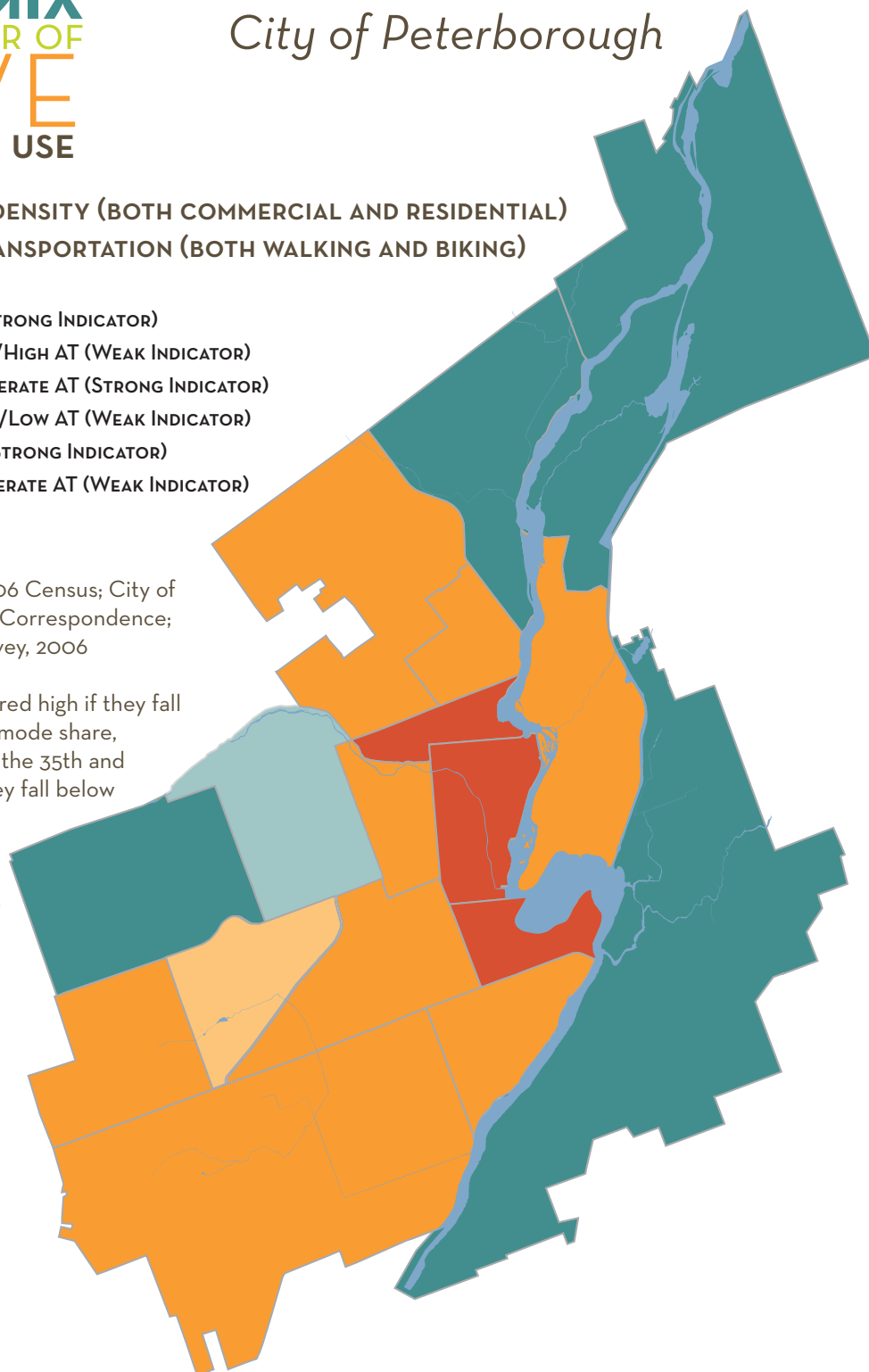
### City of Peterborough

RELATIONSHIP BETWEEN DENSITY (BOTH COMMERCIAL AND RESIDENTIAL)  
AND RATES OF ACTIVE TRANSPORTATION (BOTH WALKING AND BIKING)

- LOW DENSITY AND LOW AT (STRONG INDICATOR)
- LOW DENSITY AND MODERATE/HIGH AT (WEAK INDICATOR)
- MODERATE DENSITY AND MODERATE AT (STRONG INDICATOR)
- MODERATE DENSITY AND HIGH/LOW AT (WEAK INDICATOR)
- HIGH DENSITY AND HIGH AT (STRONG INDICATOR)
- HIGH DENSITY AND LOW/MODERATE AT (WEAK INDICATOR)

Source: Statistics Canada, 2006 Census; City of Peterborough, 2014, Personal Correspondence; Transportation Tomorrow Survey, 2006

Note: Rates of AT are considered high if they fall above the 85th percentile AT mode share, moderate if they fall between the 35th and 85th percentile, and low if they fall below the 35th percentile. Density is considered high if it falls above the 85th percentile population density per square kilometer, moderate if it falls between the 35th and 85th percentile, and low if it falls below the 35th percentile.





# WEATHER & TRAVEL BEHAVIOUR

USUAL MODE OF TRANSPORTATION  
FOR PERSONS OVER 15 YEARS, FOR  
THE TRIP TO WORK, CANADA-WIDE

DRIVING

TRANSIT

WALKING  
& BIKING

WARMER MONTHS

73%

10%

14%

COLDER MONTHS

81%

11%

6%

Source: Households and the Environment, Statistics Canada, 2006

Another important factor that serves to influence rates of active transportation in the City and County of Peterborough is the weather. Although there is no available data to demonstrate seasonal fluctuations in active transportation locally, national data indicate that rates of walking and cycling decrease by more than half in the winter months. When surveyed, City residents indicated that weather was one of the top three factors influencing their decision to walk or cycle for transportation.

## IN A RECENT TRAVEL STUDY OF PETERBOROUGH RESIDENTS...



37%

indicated that poor weather conditions would influence their decision to walk

3<sup>rd</sup>

Weather was the 3<sup>rd</sup> most frequently cited barrier after 'time' and 'distance'



24%

indicated that poor weather conditions would influence their decision to cycle

2<sup>nd</sup>

Weather was the 2<sup>nd</sup> most frequently cited barrier after bicycle ownership



8%

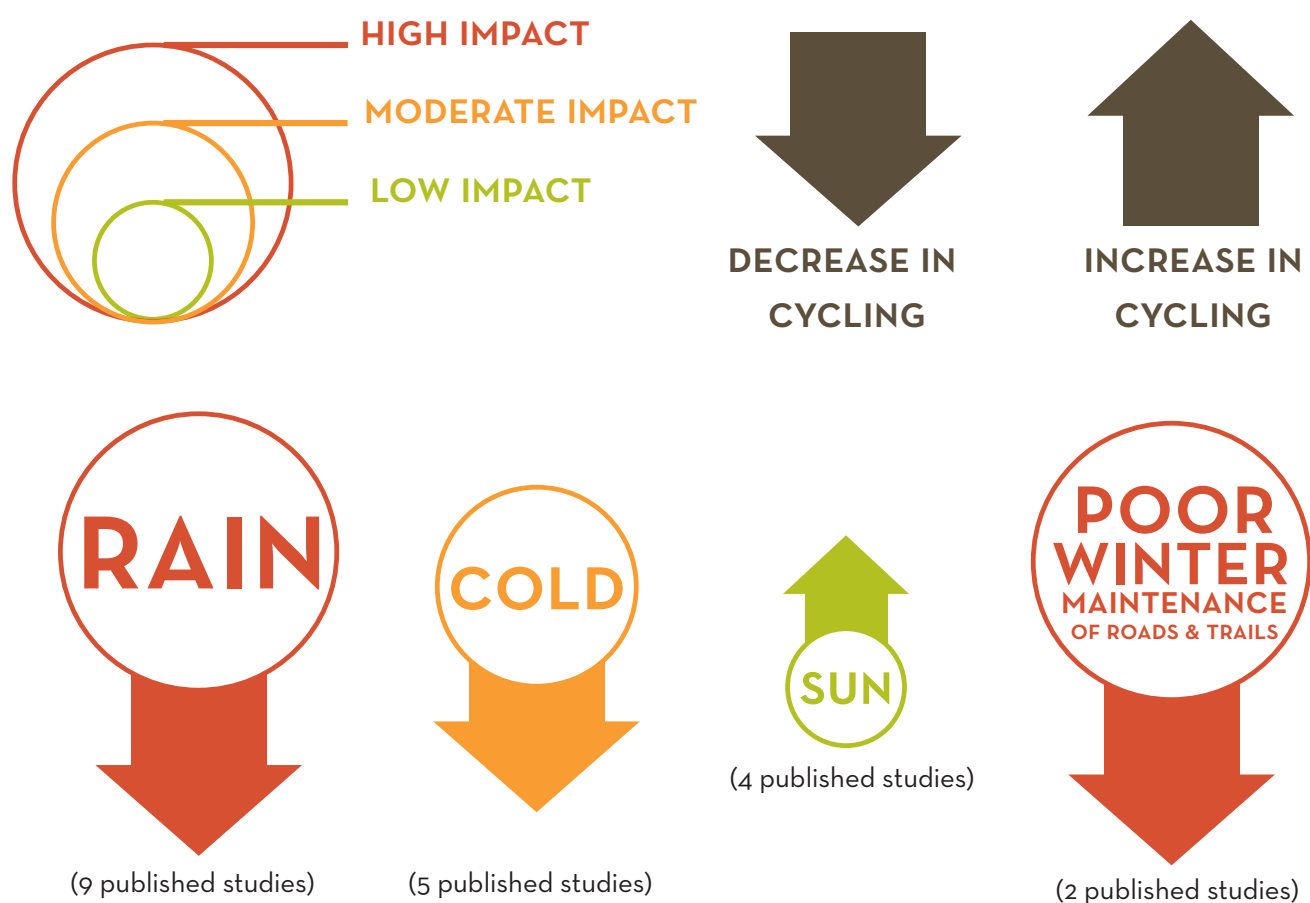
indicated that poor weather conditions would influence their decision to ride transit

8<sup>th</sup>

Weather was not seen as a barrier that significantly impacted transit ridership

Source: City of Peterborough Household Transportation Survey, 2010

Studies indicate that rain has a negative impact on active commuting (Dill and Carr 2003, Parkin et al. 2008, Winters et al. 2007, Bonham and Koth 2010, Brandenburg et al. 2007). In Peterborough, rainfall is most significant, on average, during the months of May and September. While there are fewer studies conducted in countries that receive significant snowfall, winter weather has also been shown to have a negative impact on rates of walking and cycling (Winters et al. 2007, Bergstrom and Magnusson 2003, Parkin et al. 2008). However, some of these studies have noted that comprehensive and consistent snow clearing on cycling and walking routes has helped to sustain higher levels of active transportation during winter months (Bergstrom and Magnusson 2003). Finally, shorter winter days characteristic of higher latitude cities can also decrease rates of active transportation, cycling in particular (Stinson and Bhat 2004, Bergstrom and Magnusson 2003, Gatersleben and Appleton 2007).



While much of the literature focuses on the impact to purpose-driven cycling rates, the sensitivity of recreational cyclists to weather-related factors is likely to be even more significant.





Photo Credit: Clifford McCarten



# CHAPTER TWO

## LEVELS OF USE

This section presents trends in the levels of use for all modes of transportation since 1996. Travel trends focus primarily on the trip to work. For many adults, traveling to work is among the most habitual and frequently made trip. The trip to work is also important from a community design perspective, because it is during peak commute periods that our roadways are at their maximum capacity, creating pressures to expand the existing infrastructure and accommodate demand. Although it is important to reflect on the ways in which residents travel for all trips, exploring work-specific travel behaviour can provide us with a sense of how transportation decisions across our communities are evolving over time. The impact infrastructure, policy, and programming have on local travel trends is explored in greater detail in Chapters Three, Four, and Five.



Photo Credit: Susan Sauvé

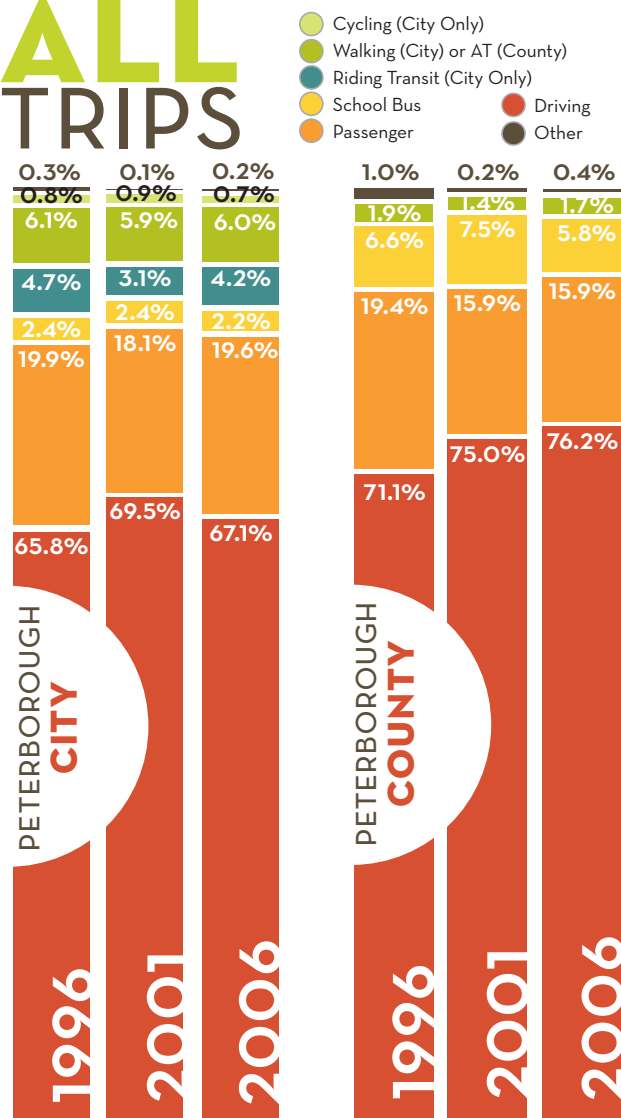


## HOW WE TRAVEL

In both the City and County of Peterborough, driving remains the most common way residents travel, with riding as a passenger ranking as the second most frequent travel type. For persons of all ages and for trips of any nature, driving and riding as a passenger account for more than 85% of all trips for City residents and greater than 90% of all trips for County residents.

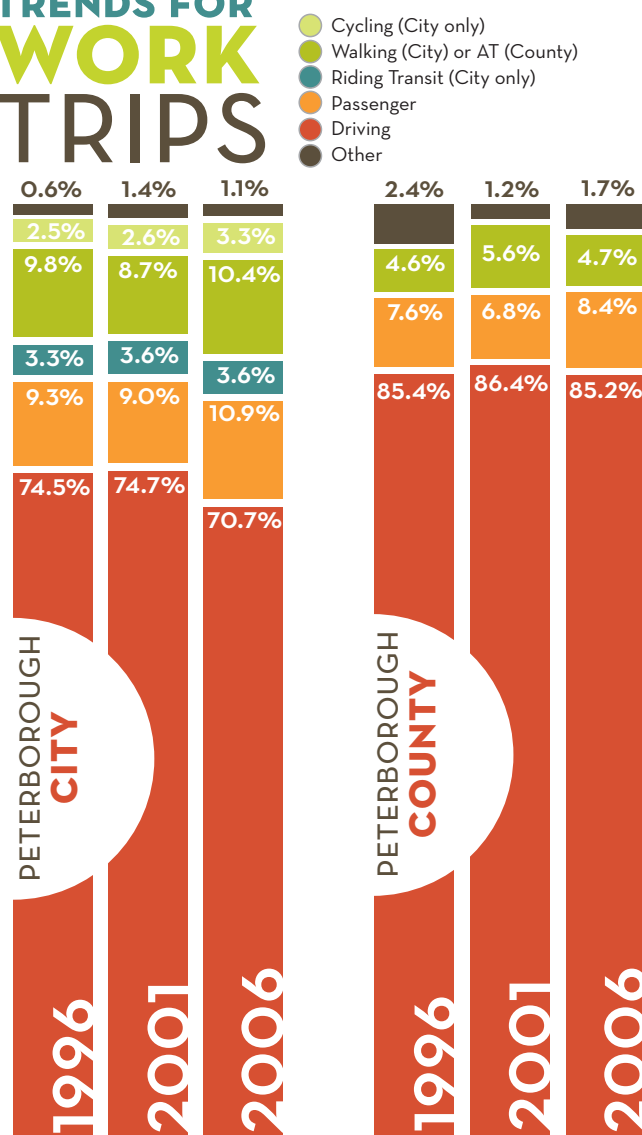
In the City and the County of Peterborough, overall incidence of walking and cycling have remained relatively stable since 1996. However, when one considers only commute to work trips for employed persons over the age of 15 year, an increase in rates of walking and cycling with time is observed among City residents. In 2006, 10.4% of City residents walked to work and 3.3% cycled to work - this is substantially higher than the provincial average where 5.6% of residents walked and 1.2% cycled to work.

### TRENDS FOR ALL TRIPS



Source: Transportation Tomorrow Survey 1996, 2001, 2006  
Notes: Community mode shares represent all trips made for persons 11 years and older.

### TRENDS FOR WORK TRIPS



Source: Canadian Census 1996, 2001, 2006  
Notes: Commuter mode shares represent only the trip to work for employed persons with a regular place of work who are over 15 years of age.

## WALKING TO WORK

# WALKING TO WORK

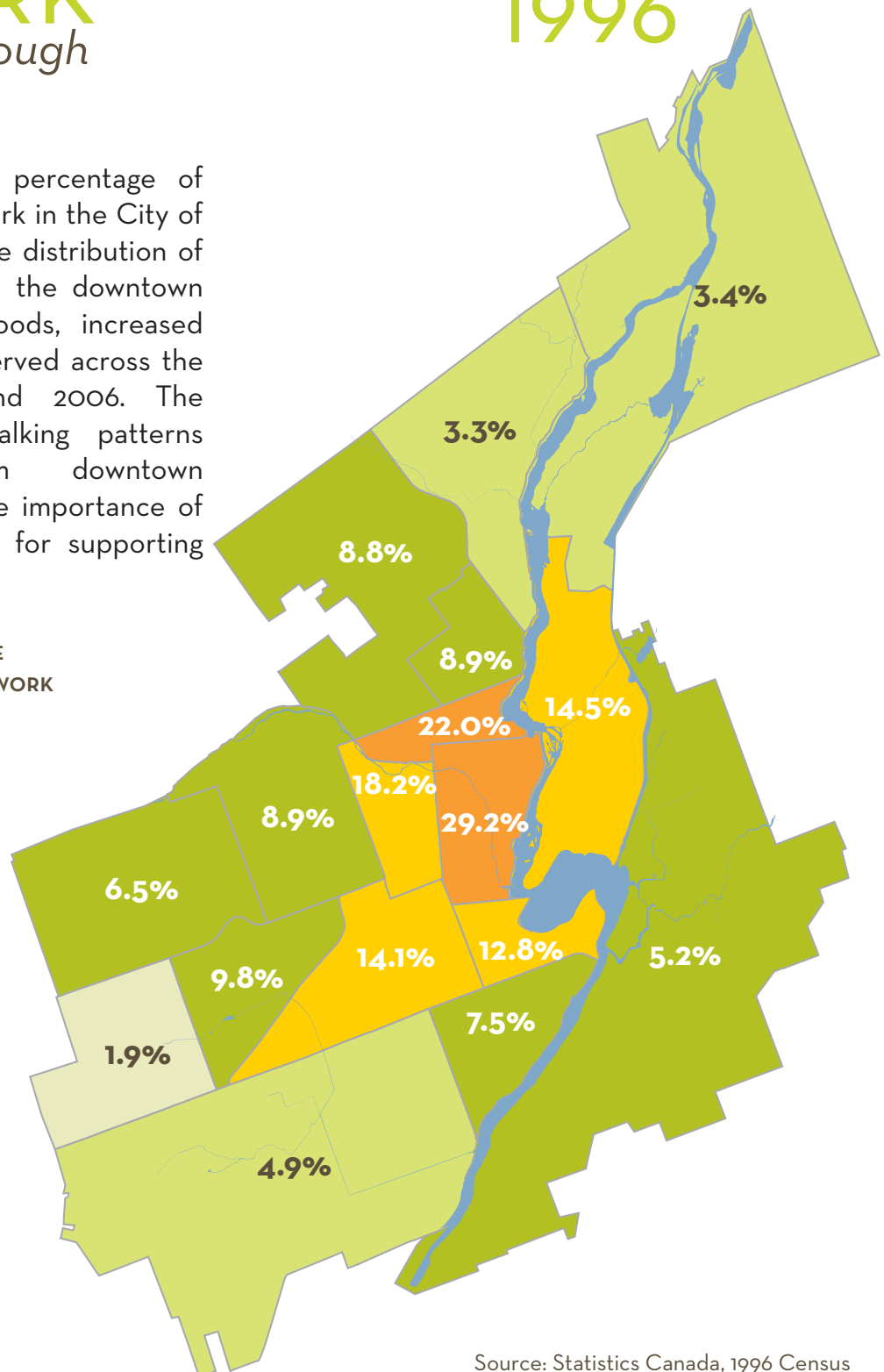
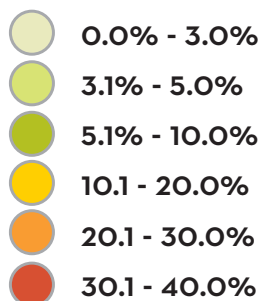
City of Peterborough

1996

### CITY

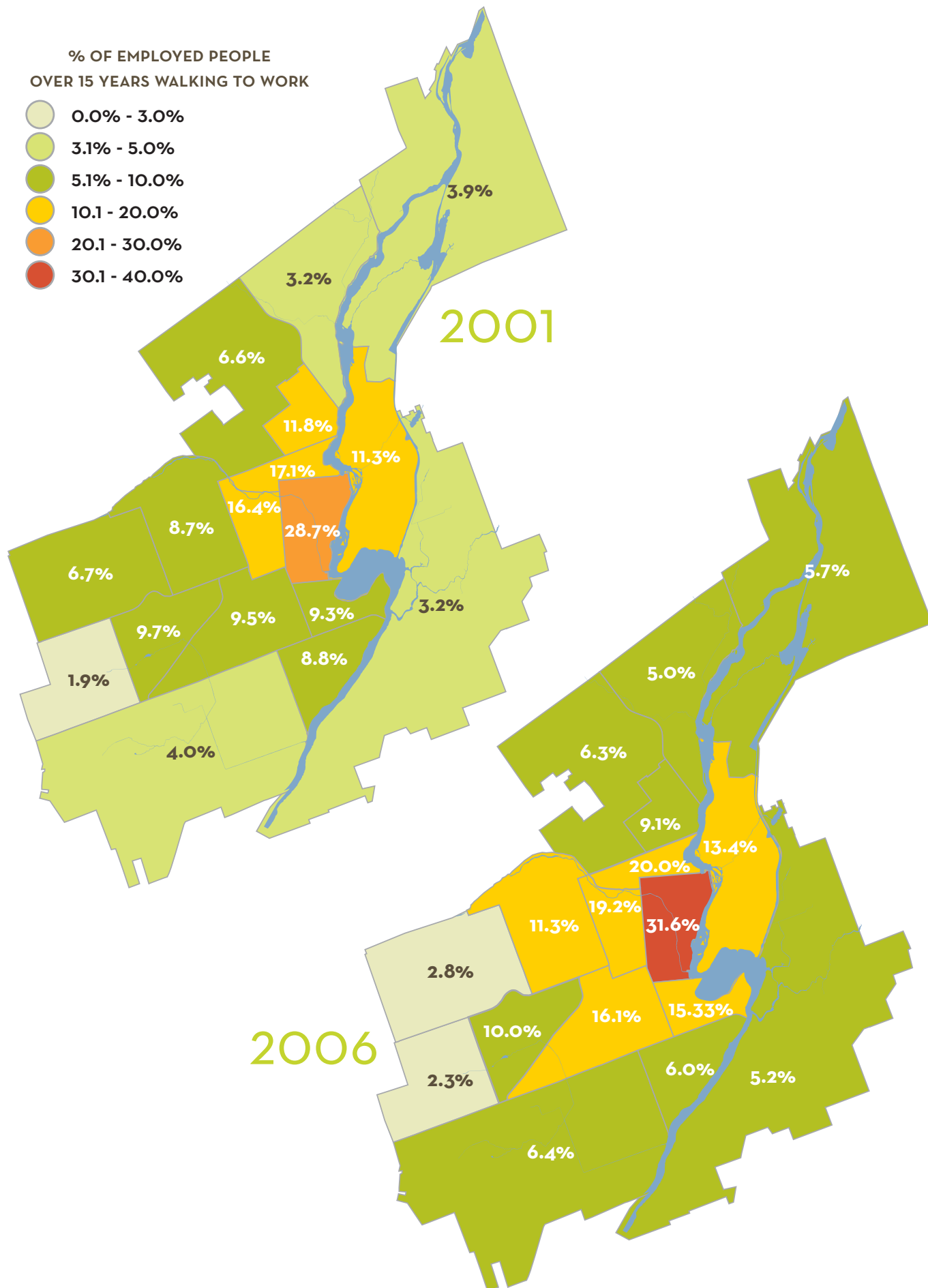
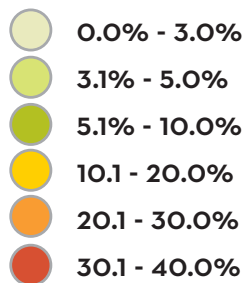
These maps display the percentage of commuters who walk to work in the City of Peterborough. Although the distribution of walkers is concentrated in the downtown and adjacent neighbourhoods, increased rates of walking were observed across the City between 2000 and 2006. The concentric circles of walking patterns emanating out from downtown Peterborough reinforce the importance of vibrant mixed-use centres for supporting active transportation.

% OF EMPLOYED PEOPLE  
OVER 15 YEARS WALKING TO WORK



Source: Statistics Canada, 1996 Census

% OF EMPLOYED PEOPLE  
OVER 15 YEARS WALKING TO WORK



Source: Statistics Canada, 2001, 2006 Census

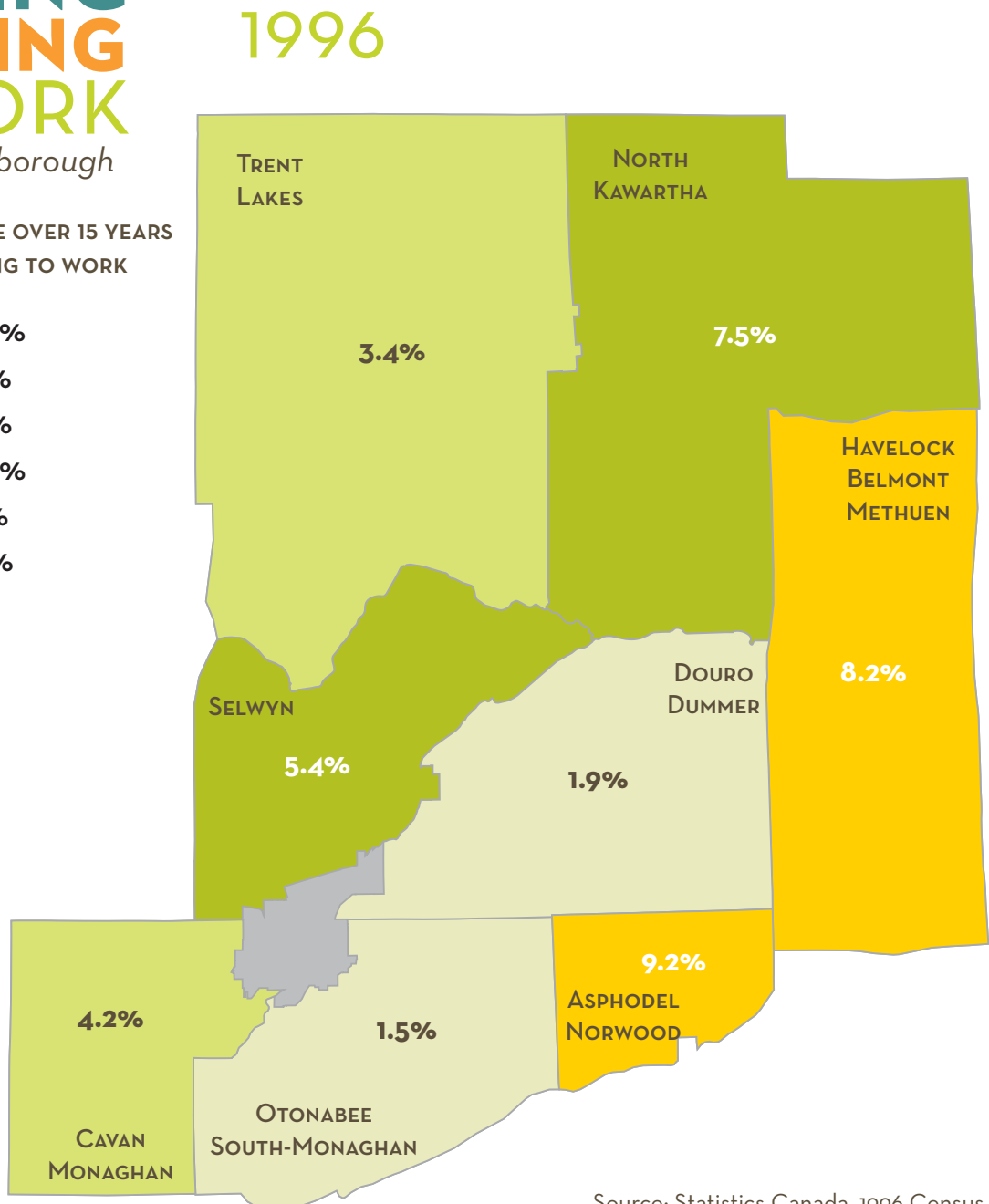
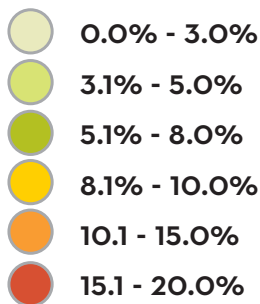
## COUNTY

The percentage of County residents that walk and cycle to work has varied quite substantially between 2000 and 2006. While one might expect that the Townships with larger settlement areas would have a higher percentage of people who walk and cycle to work, this has not consistently been the case. While more urbanized Townships such as Selwyn, Asphodel Norwood, and Havelock Belmont Methuen maintain consistently high rates of walking and cycling, rates of active transportation in 2001 were observed to be highest in North Kawartha, a relatively rural and sparsely developed Township. Combined walking and cycling rates in some Townships are higher than the provincial average.

## WALKING OR CYCLING TO WORK

County of Peterborough

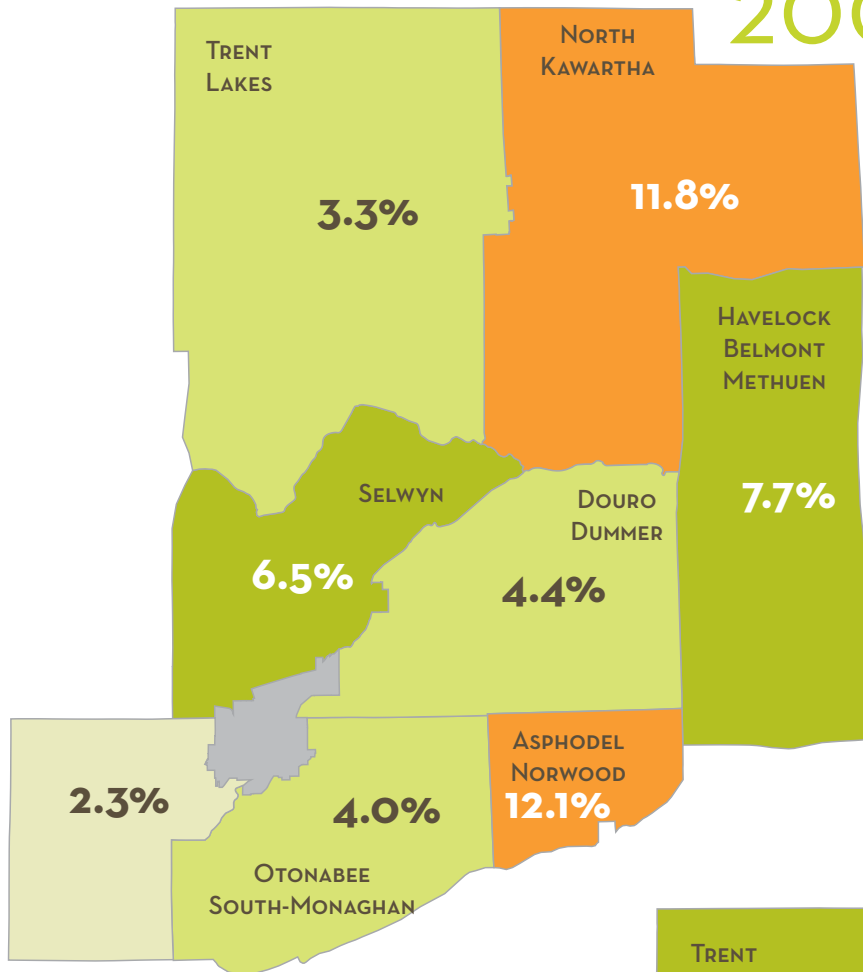
% OF EMPLOYED PEOPLE OVER 15 YEARS  
WALKING OR CYCLING TO WORK



Source: Statistics Canada, 1996 Census

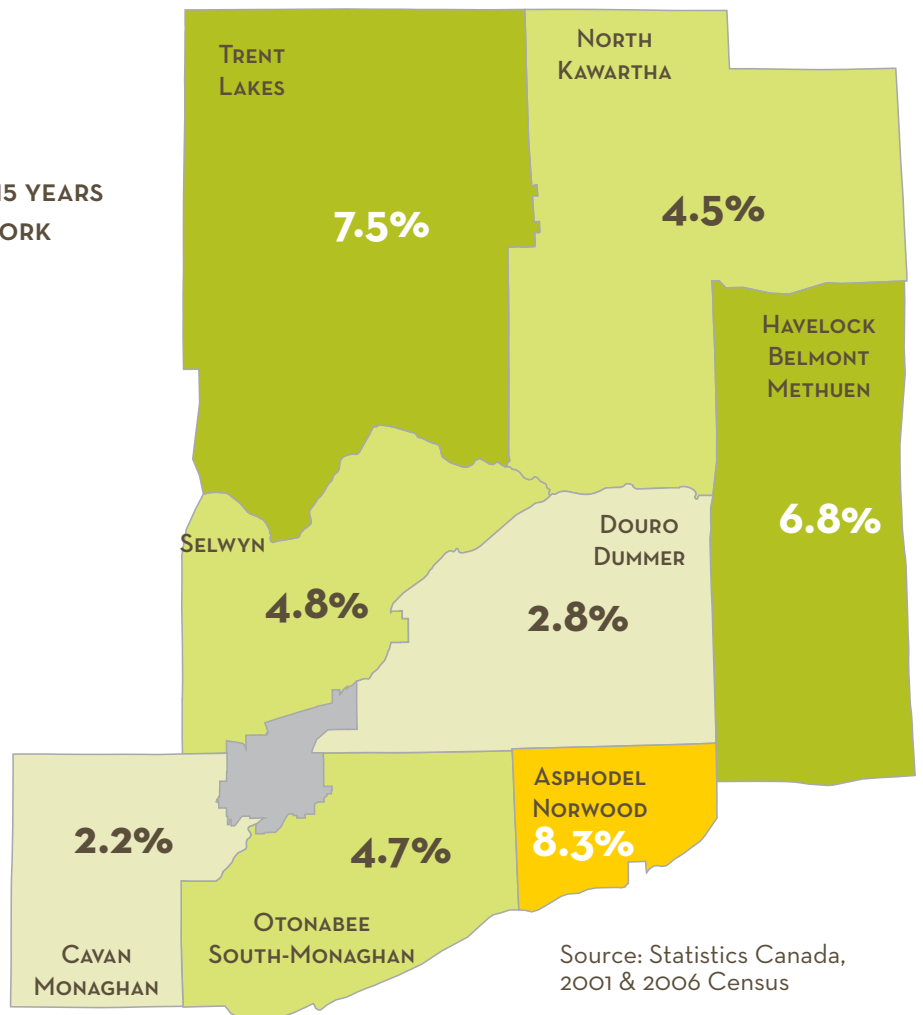
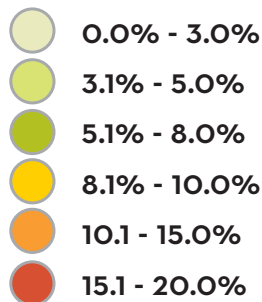


# 2001



# 2006

% OF EMPLOYED PEOPLE OVER 15 YEARS  
WALKING OR CYCLING TO WORK



Source: Statistics Canada,  
2001 & 2006 Census

# CYCLING TO WORK

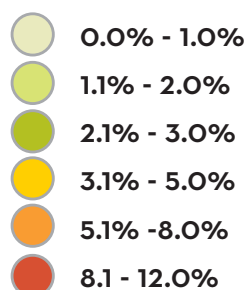
City of Peterborough

## CYCLING TO WORK

1996

These maps display rates of cycling over time, and also display the development of cycling-specific facilities over the same period. While trends for different neighbourhoods are variable, in general we see an increase in the number of Peterborough residents cycling to work. In recent years, we have seen a particular increase in neighbourhoods to the north of downtown where the Rotary Trail passes through; this route is particularly popular amongst Trent University students and staff.

### % OF EMPLOYED PEOPLE OVER 15 YEARS CYCLING TO WORK

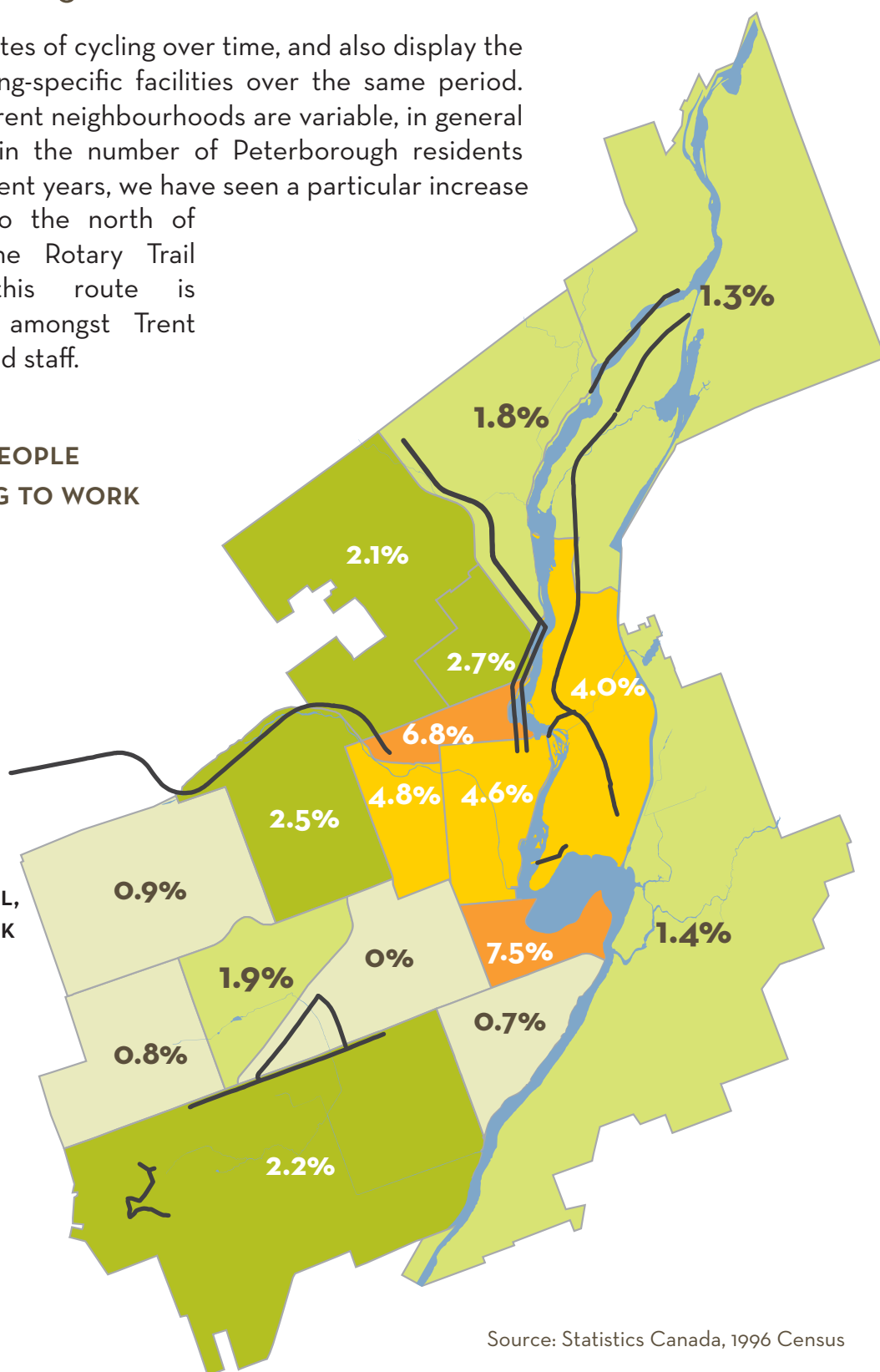


### EXISTING CYCLING INFRASTRUCTURE

— BICYCLE LANE, TRAIL,  
OR SHARED SIDEWALK

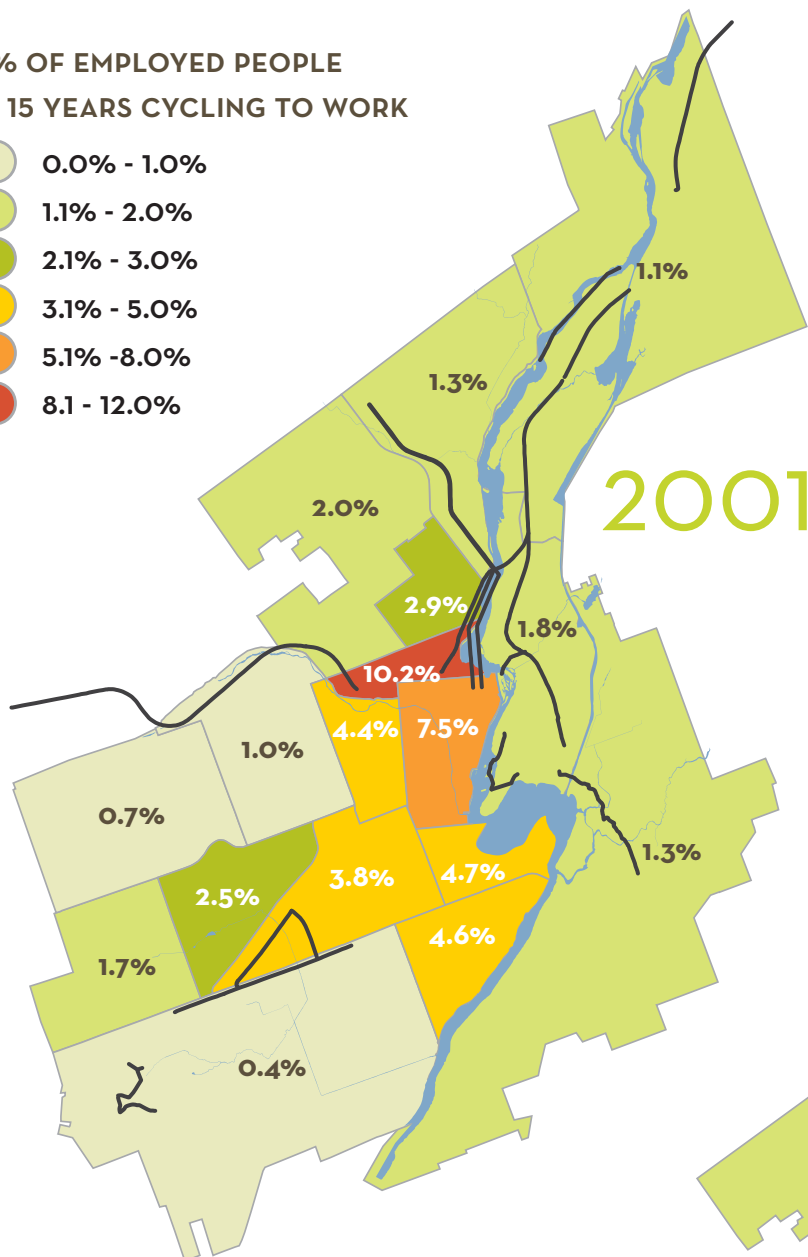
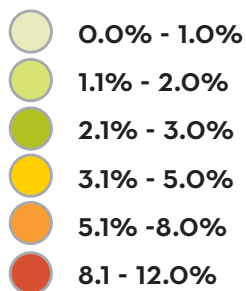
TOTAL LENGTH:

**21.9 km**



Source: Statistics Canada, 1996 Census

**% OF EMPLOYED PEOPLE  
OVER 15 YEARS CYCLING TO WORK**



2001

**EXISTING CYCLING  
INFRASTRUCTURE**

— BICYCLE LANE, TRAIL,  
OR SHARED SIDEWALK

**TOTAL LENGTH:**

**34.4 km**

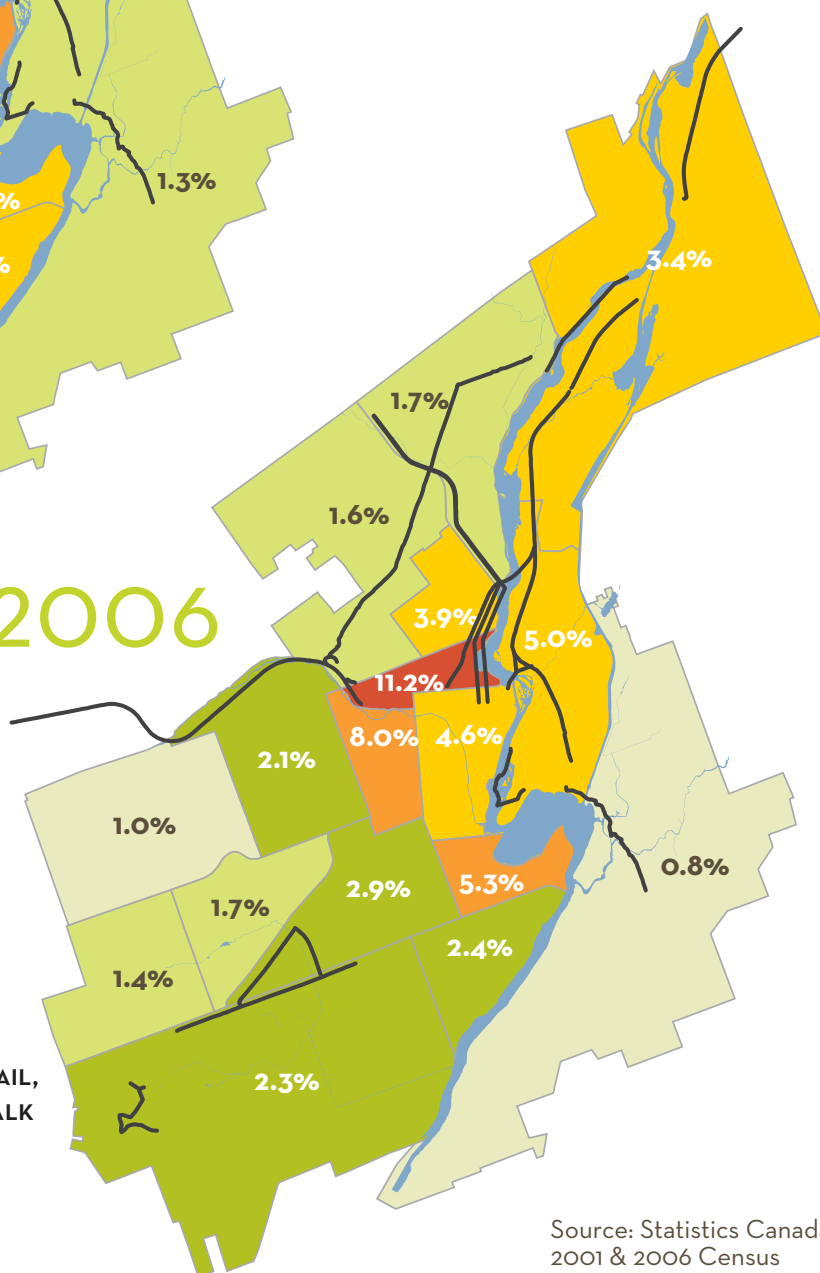
2006

**EXISTING CYCLING  
INFRASTRUCTURE**

— BICYCLE LANE, TRAIL,  
OR SHARED SIDEWALK

**TOTAL LENGTH:**

**38.7 km**



Source: Statistics Canada,  
2001 & 2006 Census

# RIDING TRANSIT TO WORK

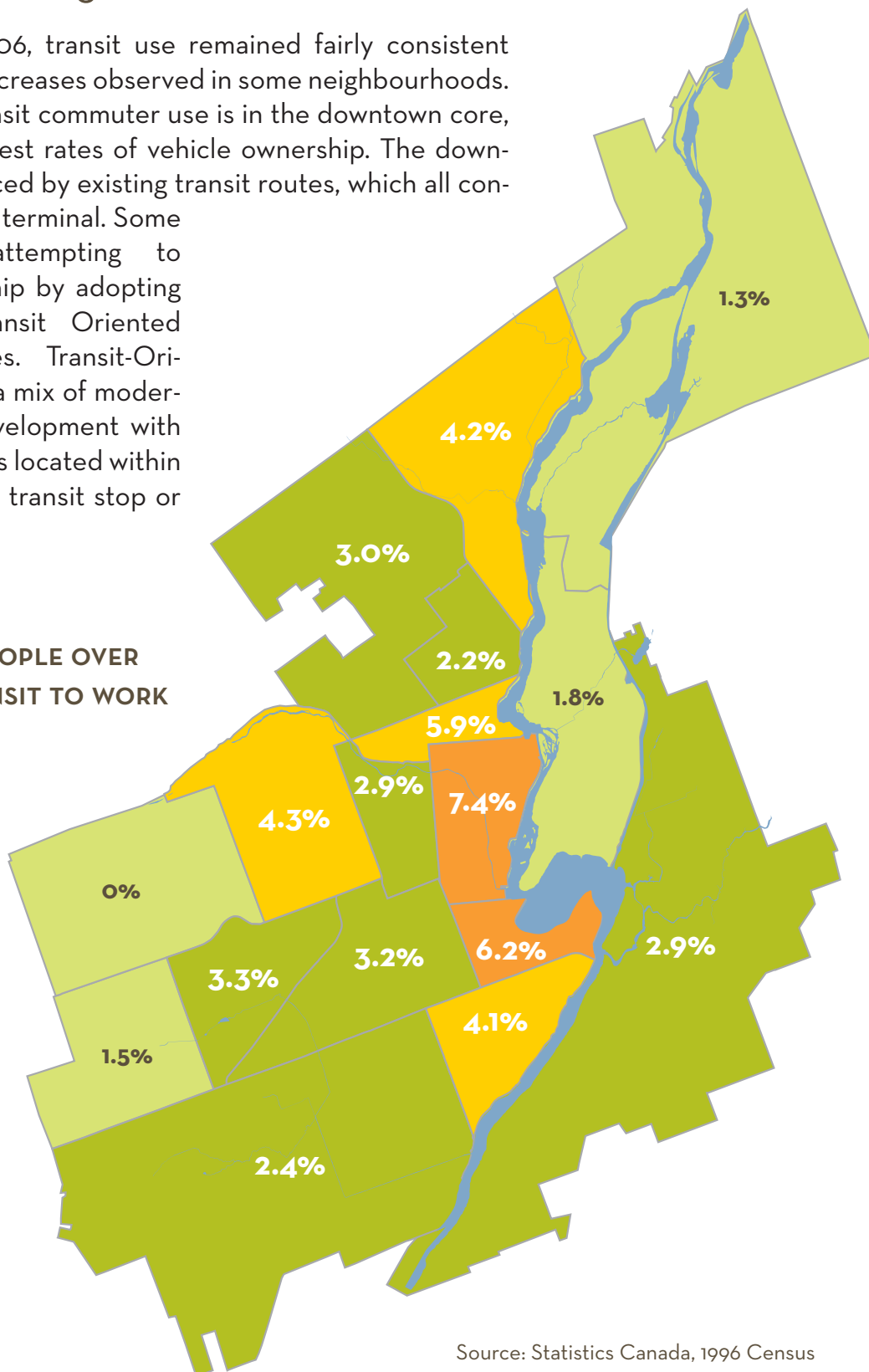
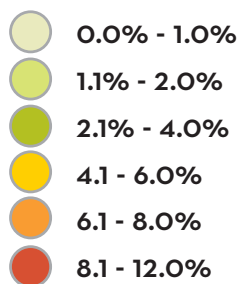
City of Peterborough

## RIDING TRANSIT TO WORK

1996

Between 1996 and 2006, transit use remained fairly consistent across the City, with decreases observed in some neighbourhoods. The highest rate of transit commuter use is in the downtown core, which also has the lowest rates of vehicle ownership. The downtown core is best serviced by existing transit routes, which all converge at the downtown terminal. Some municipalities are attempting to increase transit ridership by adopting and adhering to Transit Oriented Development guidelines. Transit-Oriented Development is a mix of moderate to high-density development with varied land-use patterns located within an easy walk of a rapid transit stop or station.

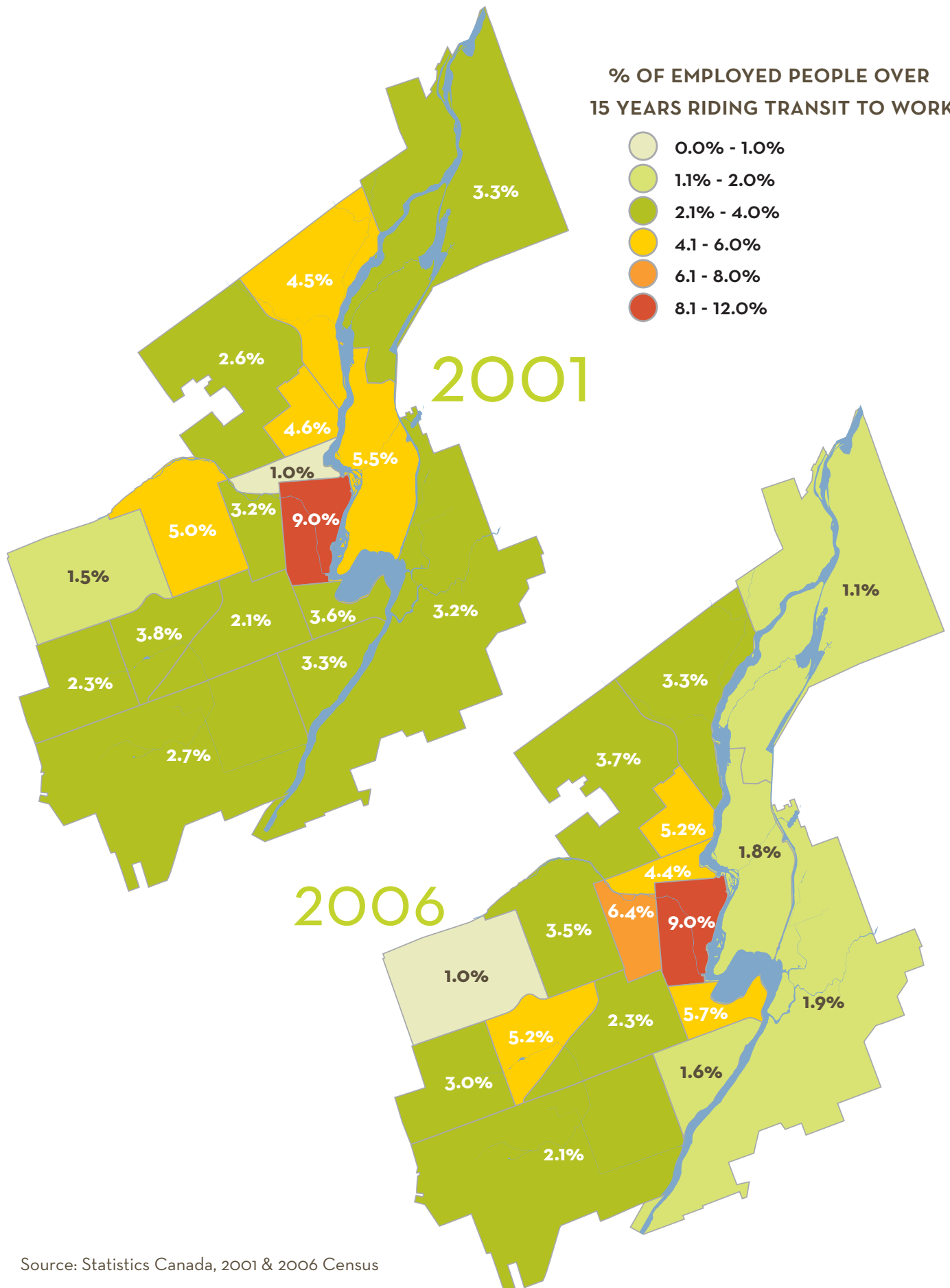
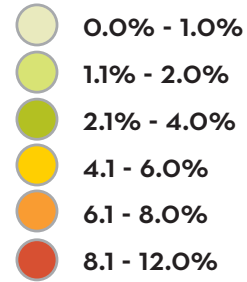
### % OF EMPLOYED PEOPLE OVER 15 YEARS RIDING TRANSIT TO WORK



Source: Statistics Canada, 1996 Census



**% OF EMPLOYED PEOPLE OVER  
15 YEARS RIDING TRANSIT TO WORK**



Source: Statistics Canada, 2001 & 2006 Census

# CARPOOLING TO WORK

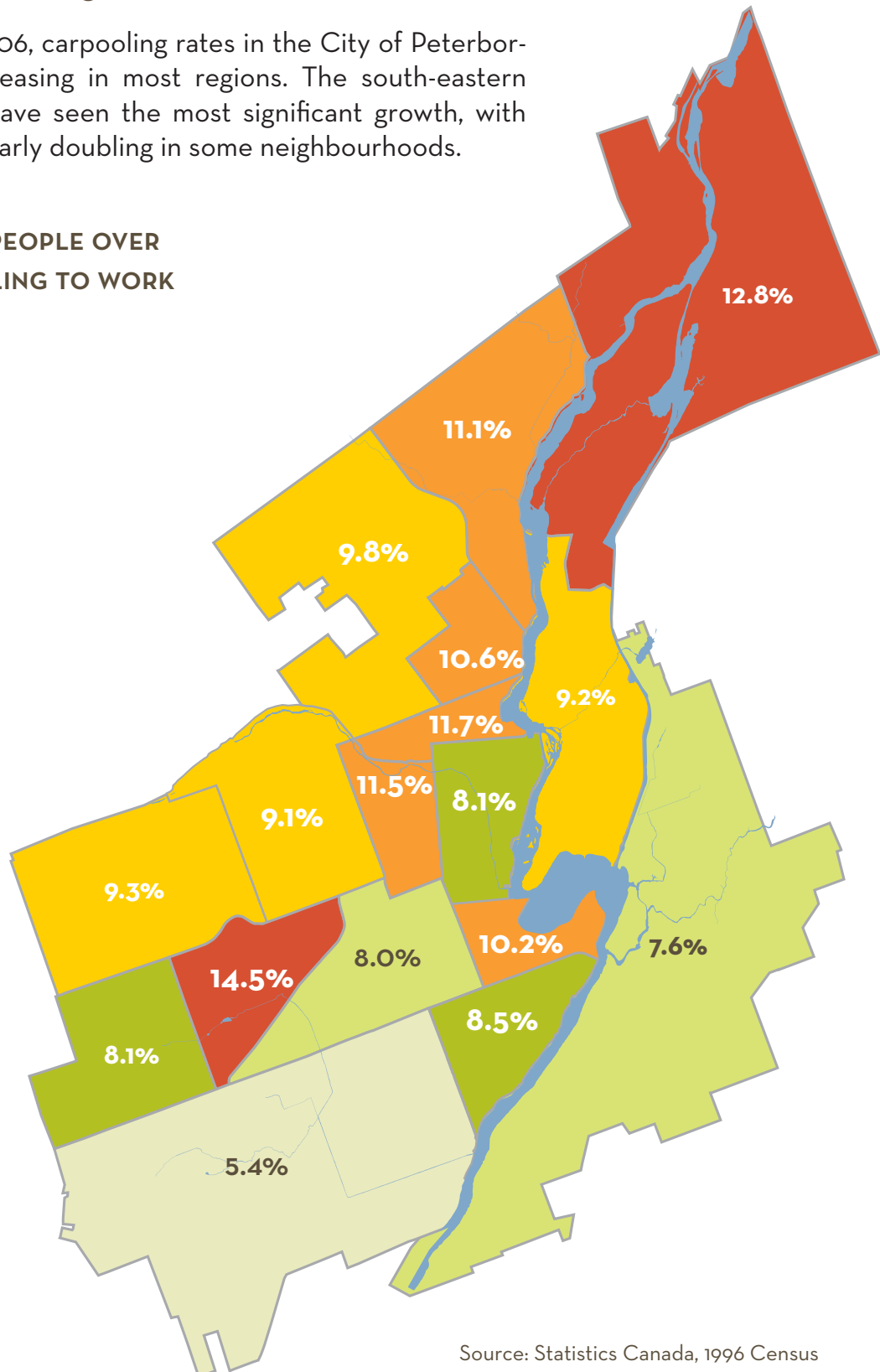
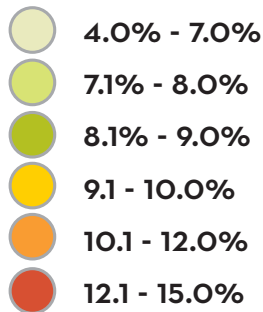
City of Peterborough

## CARPOOLING TO WORK

1996

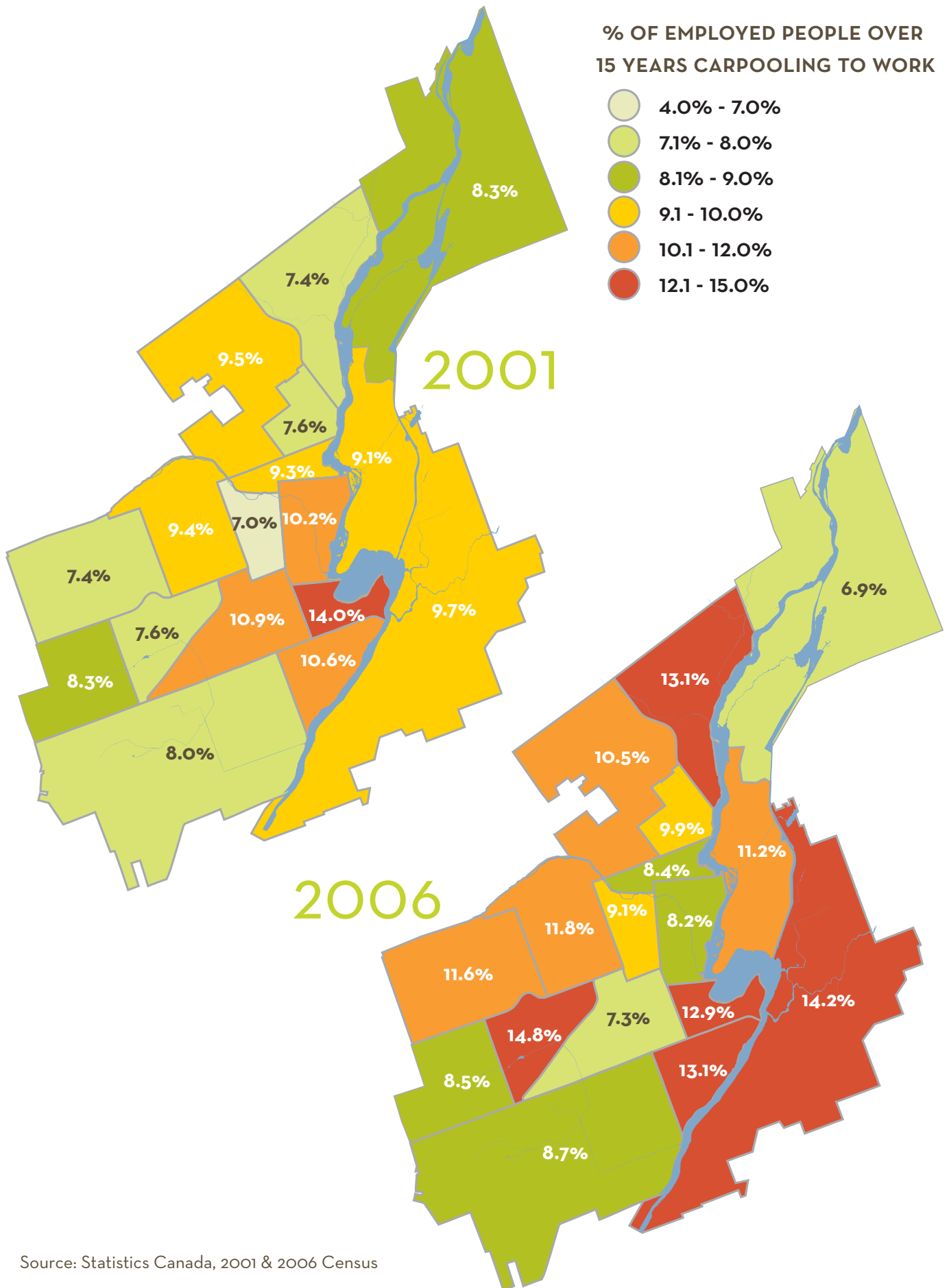
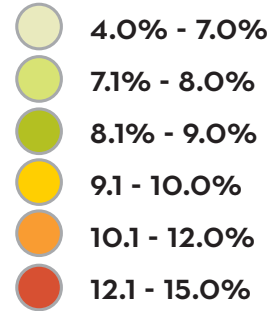
Between 1996 and 2006, carpooling rates in the City of Peterborough have been increasing in most regions. The south-eastern regions of the City have seen the most significant growth, with rates of carpooling nearly doubling in some neighbourhoods.

### % OF EMPLOYED PEOPLE OVER 15 YEARS CARPOOLING TO WORK



Source: Statistics Canada, 1996 Census

% OF EMPLOYED PEOPLE OVER 15 YEARS CARPOOLING TO WORK



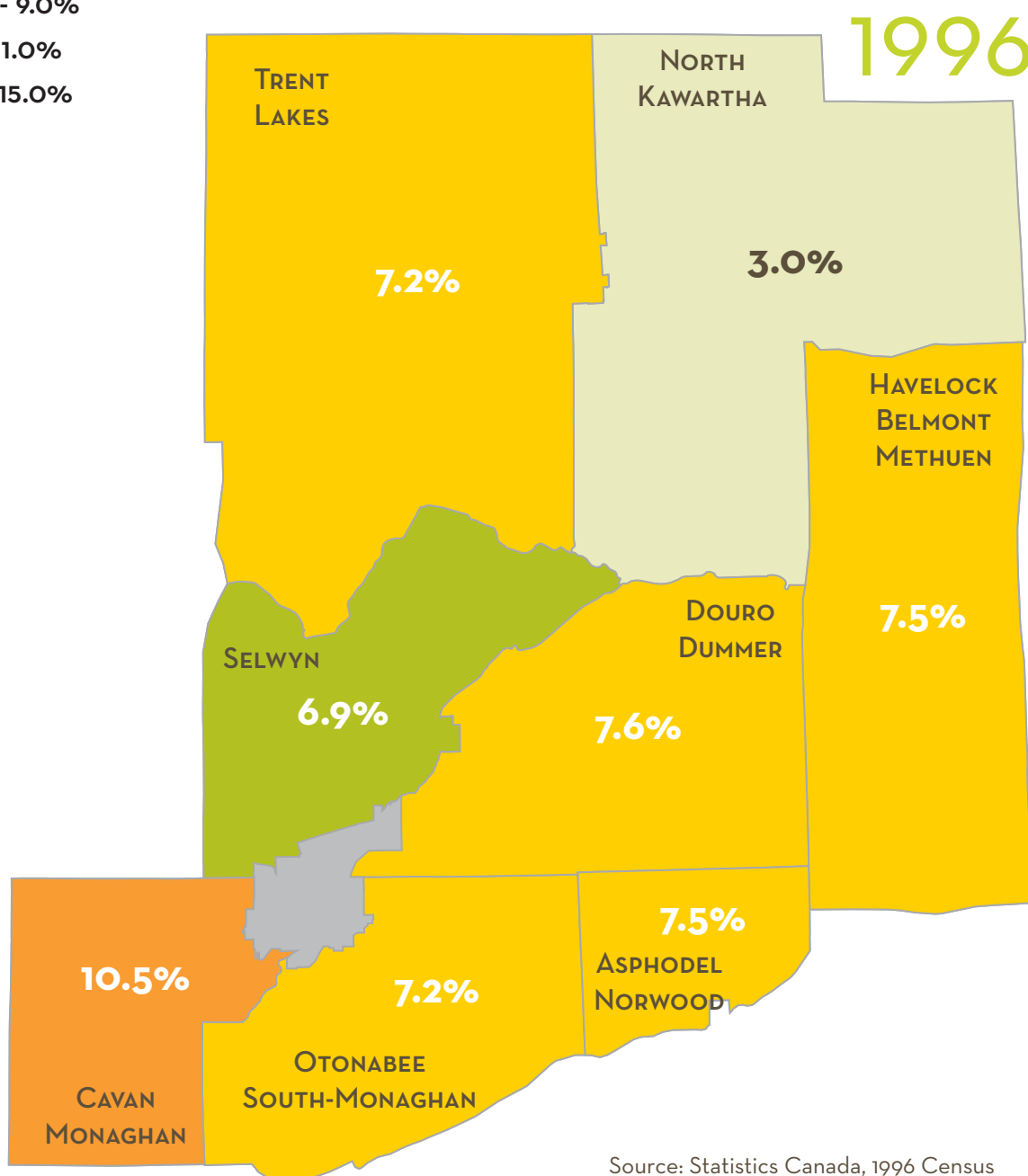
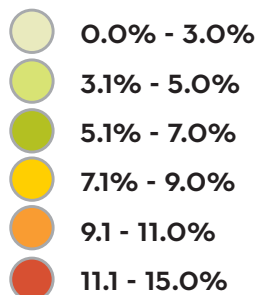
Source: Statistics Canada, 2001 & 2006 Census

# CARPOOLING TO WORK

County of Peterborough

In the County, there was an increase in the percentage of people who carpooled to work, which coincides with the reduction in those who reported driving to work. Many people who live in the County work in the City or commute to areas outside of the Peterborough region, and recent fuel price increases, combined with City and Provincial programs designed to support the shift to carpooling, may be influencing these results.

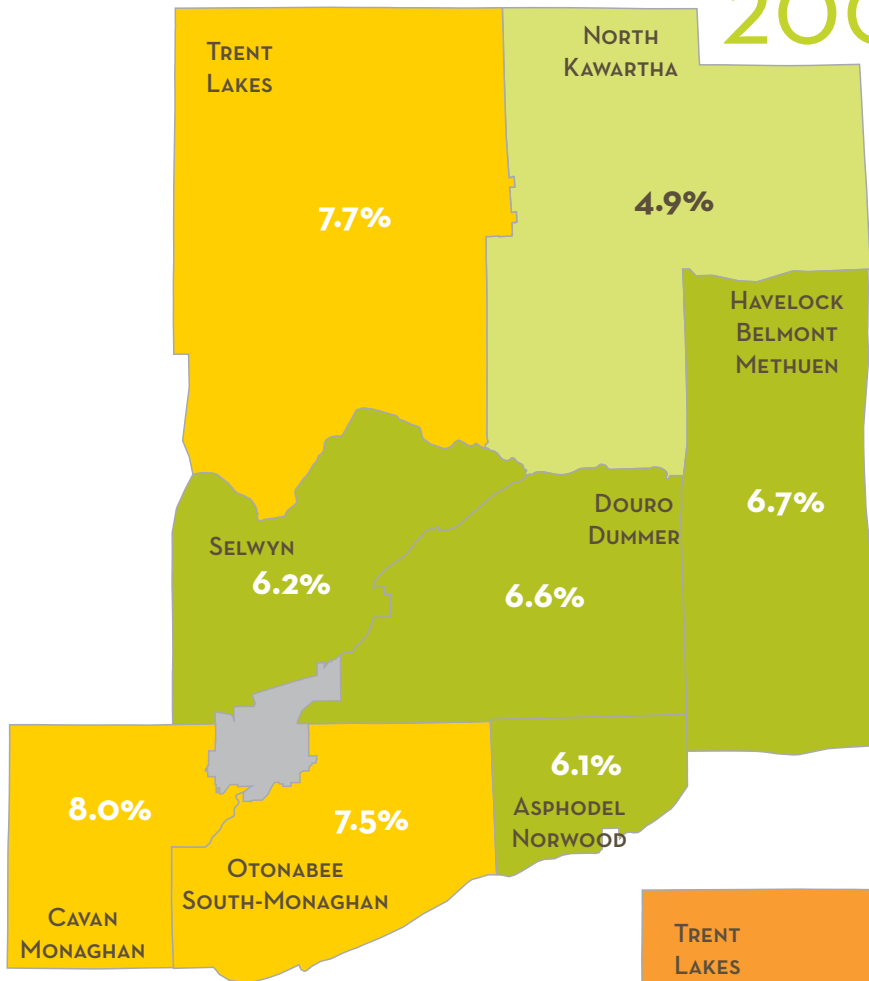
## % OF EMPLOYED PEOPLE OVER 15 CARPOOLING TO WORK



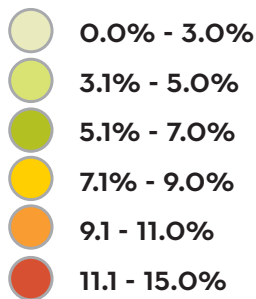
Source: Statistics Canada, 1996 Census



# 2001

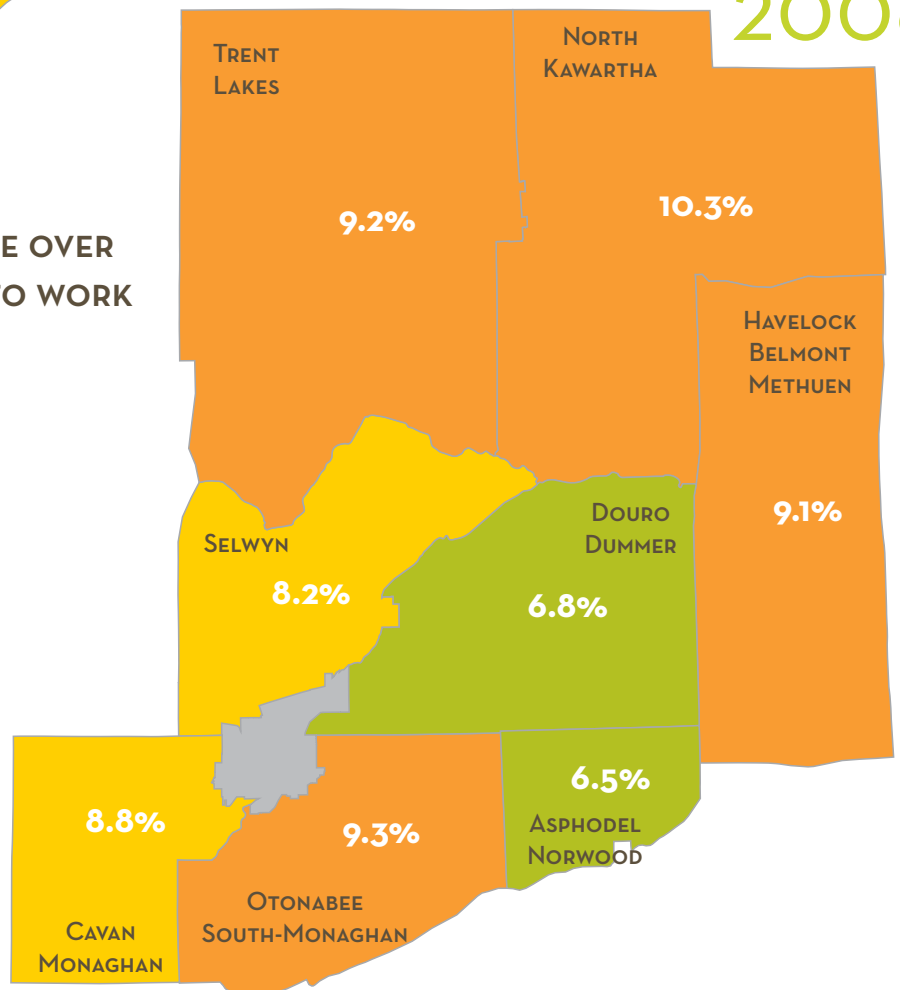


## % OF EMPLOYED PEOPLE OVER 15 YEARS CARPOOLING TO WORK



Source: Statistics Canada, 2001 & 2006 Census

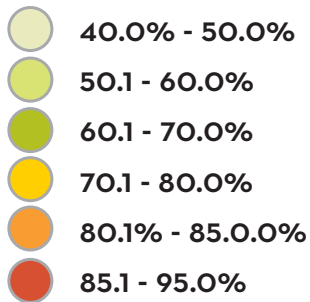
# 2006



# DRIVING TO WORK

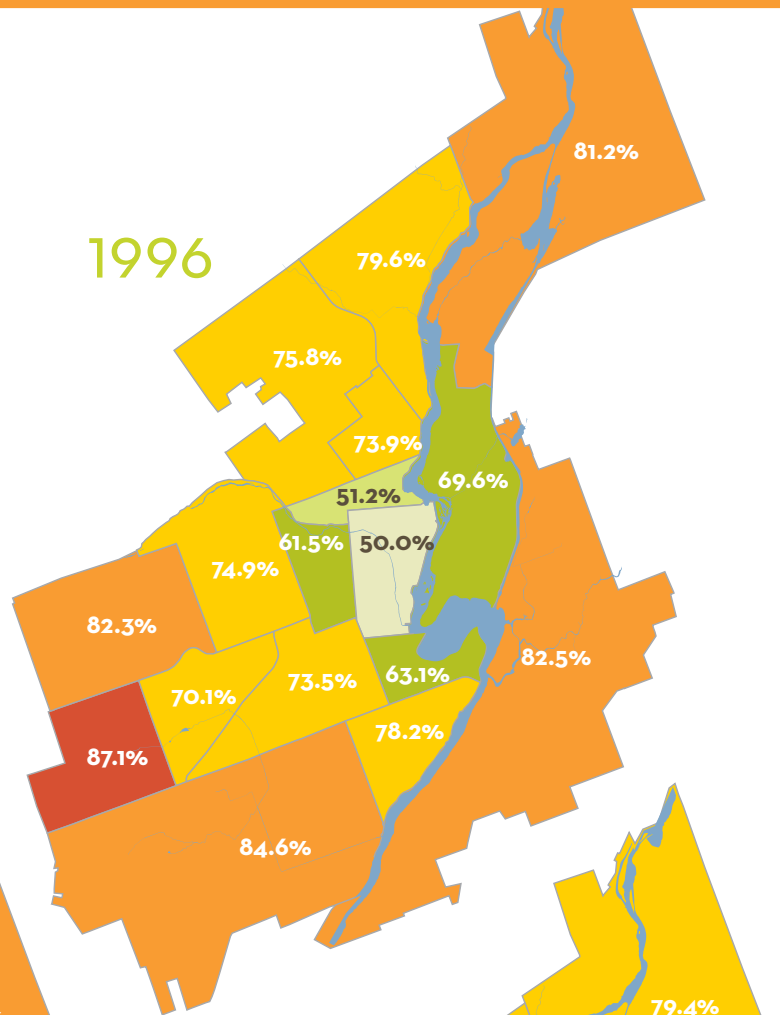
*City of Peterborough*

% OF EMPLOYED PEOPLE OVER 15 YEARS DRIVING TO WORK

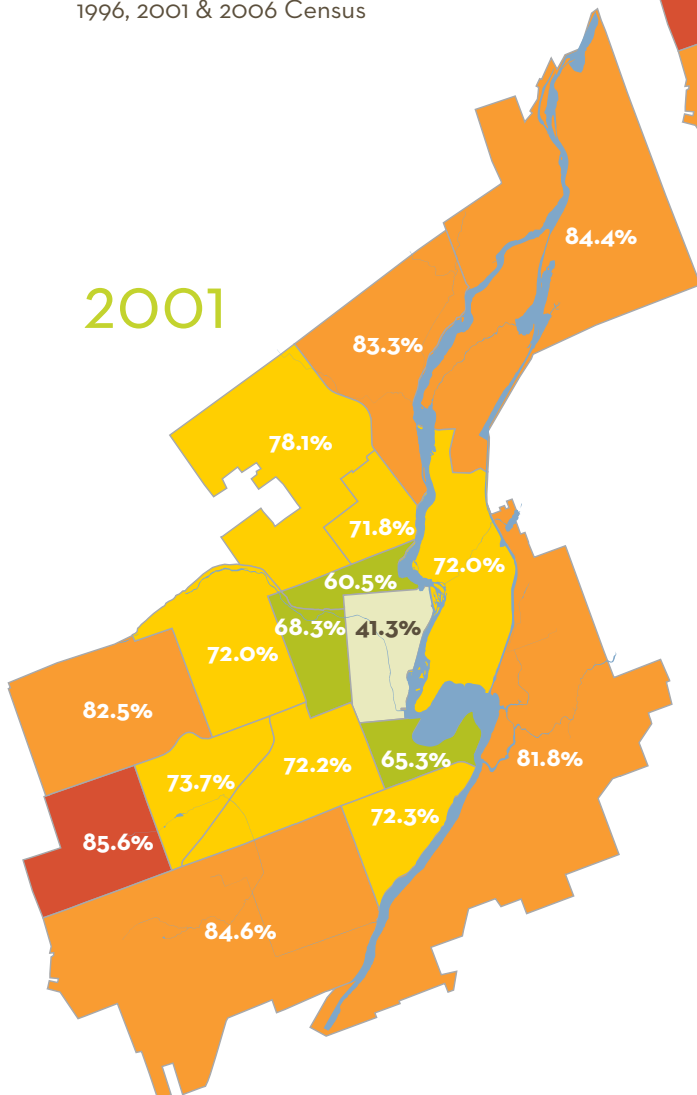


Source: Statistics Canada, 1996, 2001 & 2006 Census

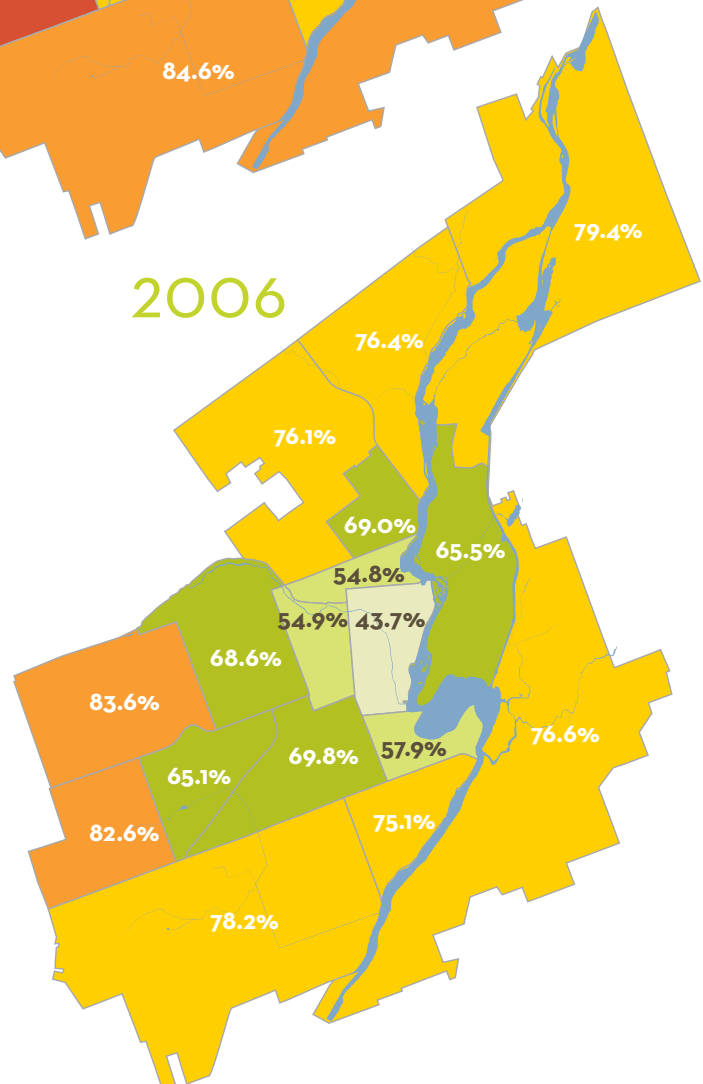
1996



2001



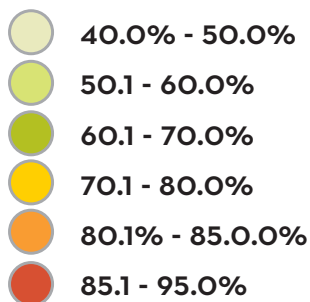
2006



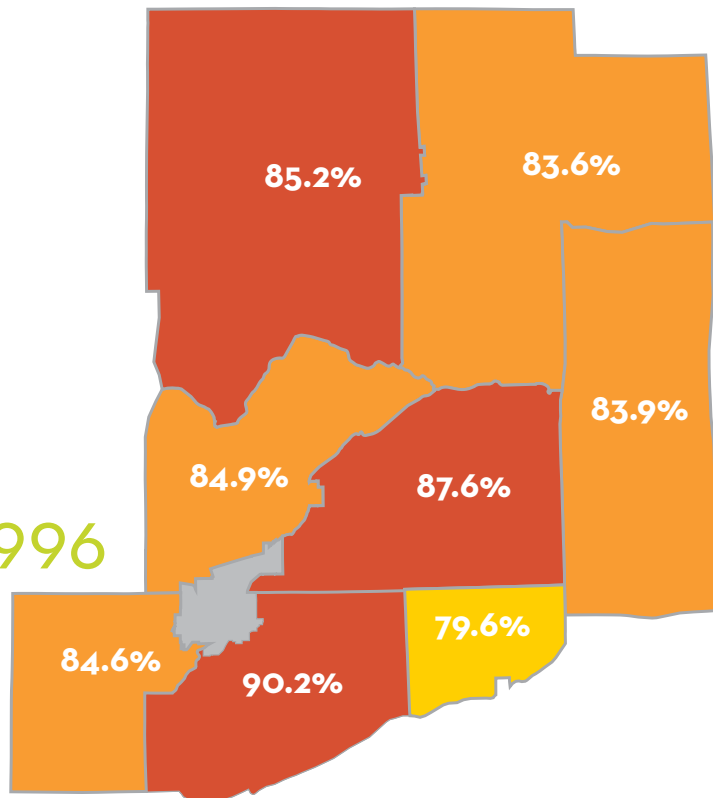
# DRIVING TO WORK

County of Peterborough

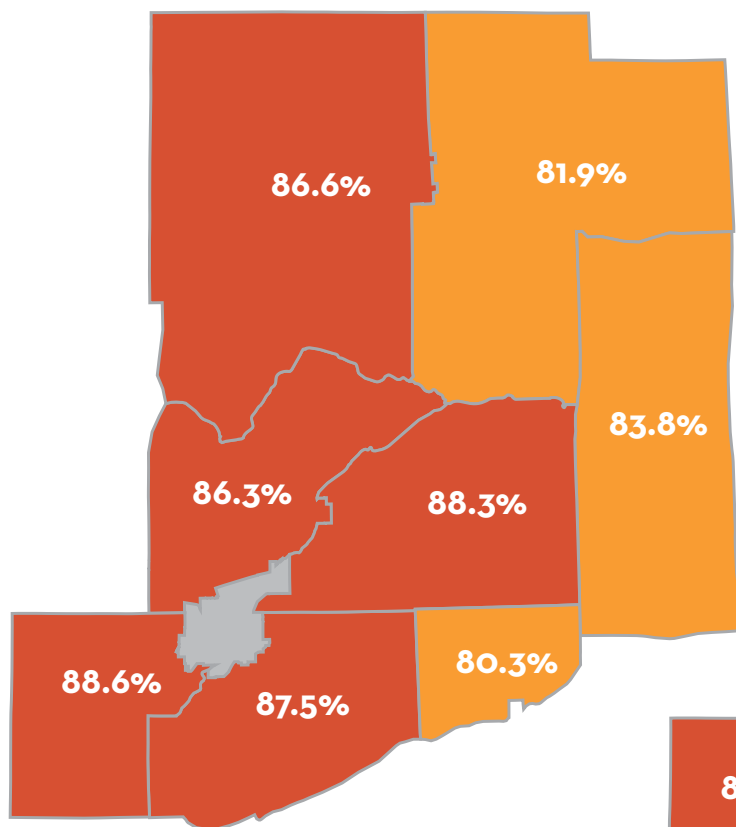
% OF EMPLOYED PEOPLE OVER 15 YEARS DRIVING TO WORK



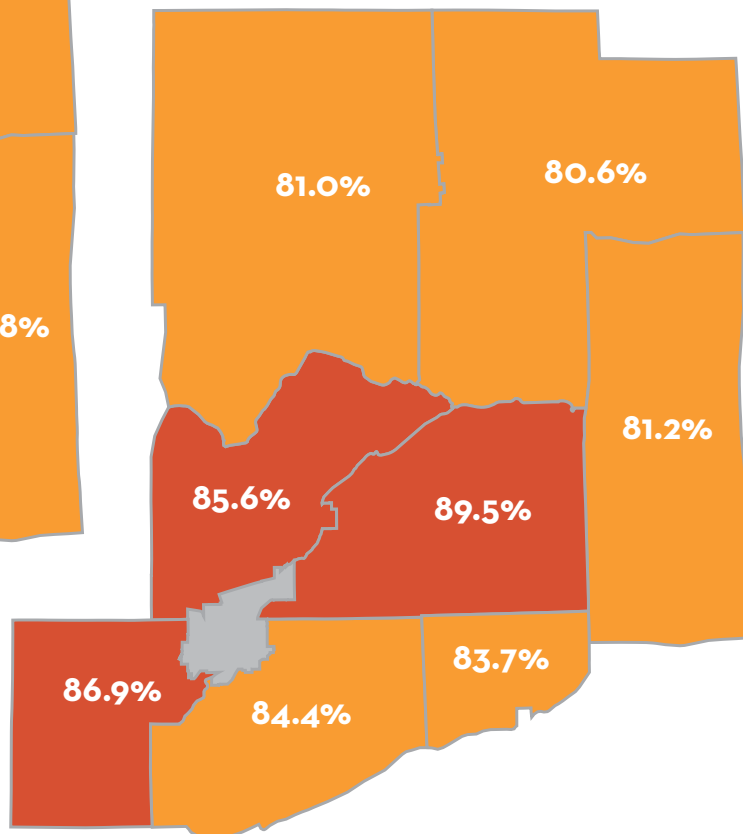
1996



2001



2006



Source: Statistics Canada,  
1996, 2001 & 2006 Census

# ACTIVE TRANSPORTATION POTENTIAL

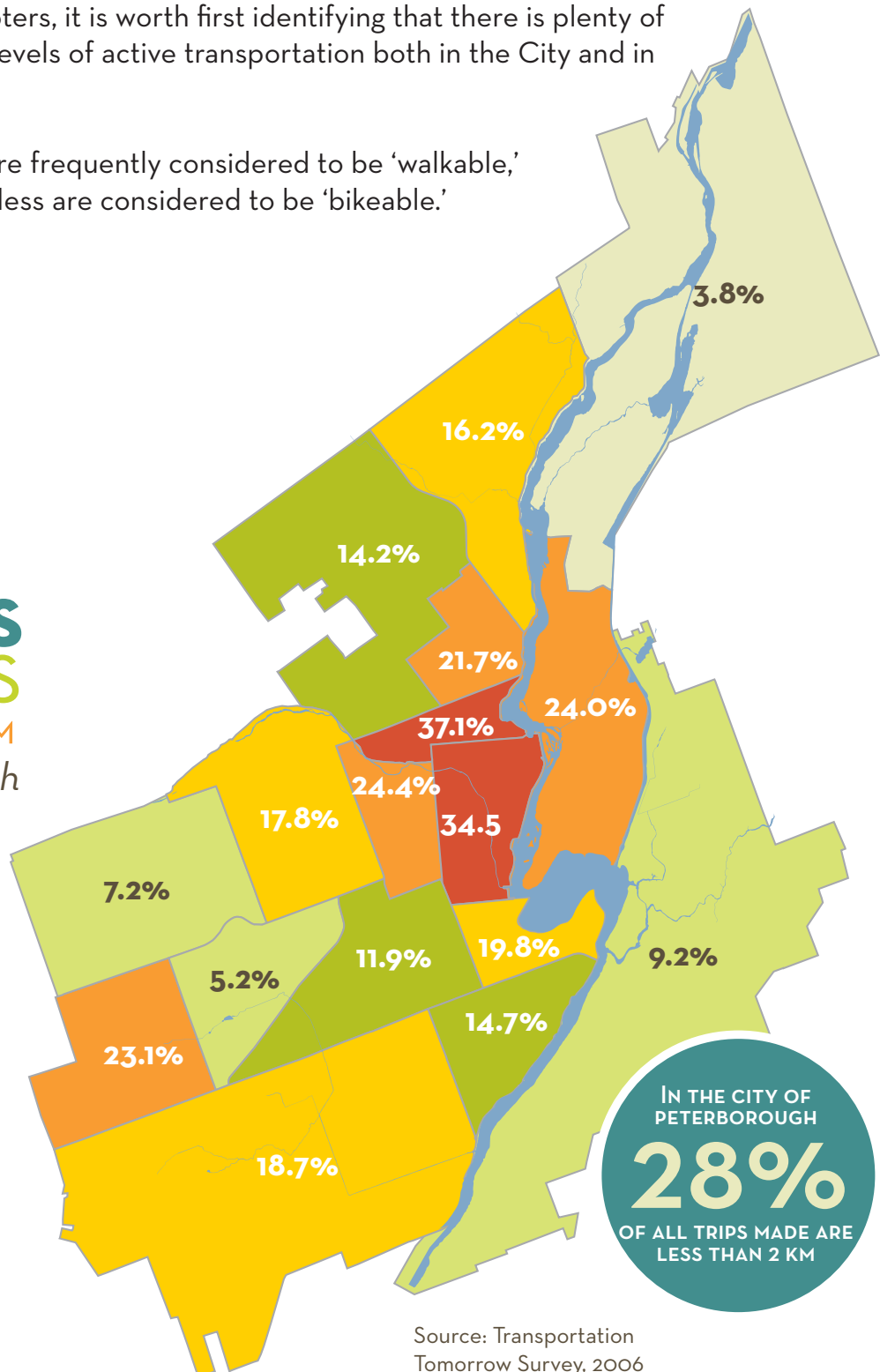
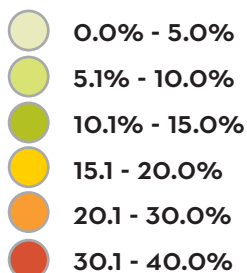
While reflecting on levels of use provides a snapshot of current travel patterns, it does not necessarily contribute to an understanding of how many trips it might be possible to shift to active modes of transportation if supporting conditions were ideal. Identifying the percentage of current trips being made within a 'walkable' or 'bikeable' distance can frame the potential for change. And, prior to exploring facilities, programs, and services that can encourage walking and cycling in subsequent chapters, it is worth first identifying that there is plenty of opportunity for growth in levels of active transportation both in the City and in the County.

Distances of 2 km or less are frequently considered to be 'walkable,' while distances of 5 km or less are considered to be 'bikeable.'

## A.T. RATES FOR TRIPS LESS THAN 2 KM

City of Peterborough

% OF PEOPLE 11 YEARS +  
WALKING OR CYCLING FOR  
TRIPS LESS THAN 2 KM



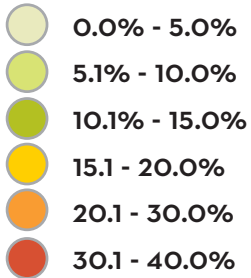
Source: Transportation  
Tomorrow Survey, 2006



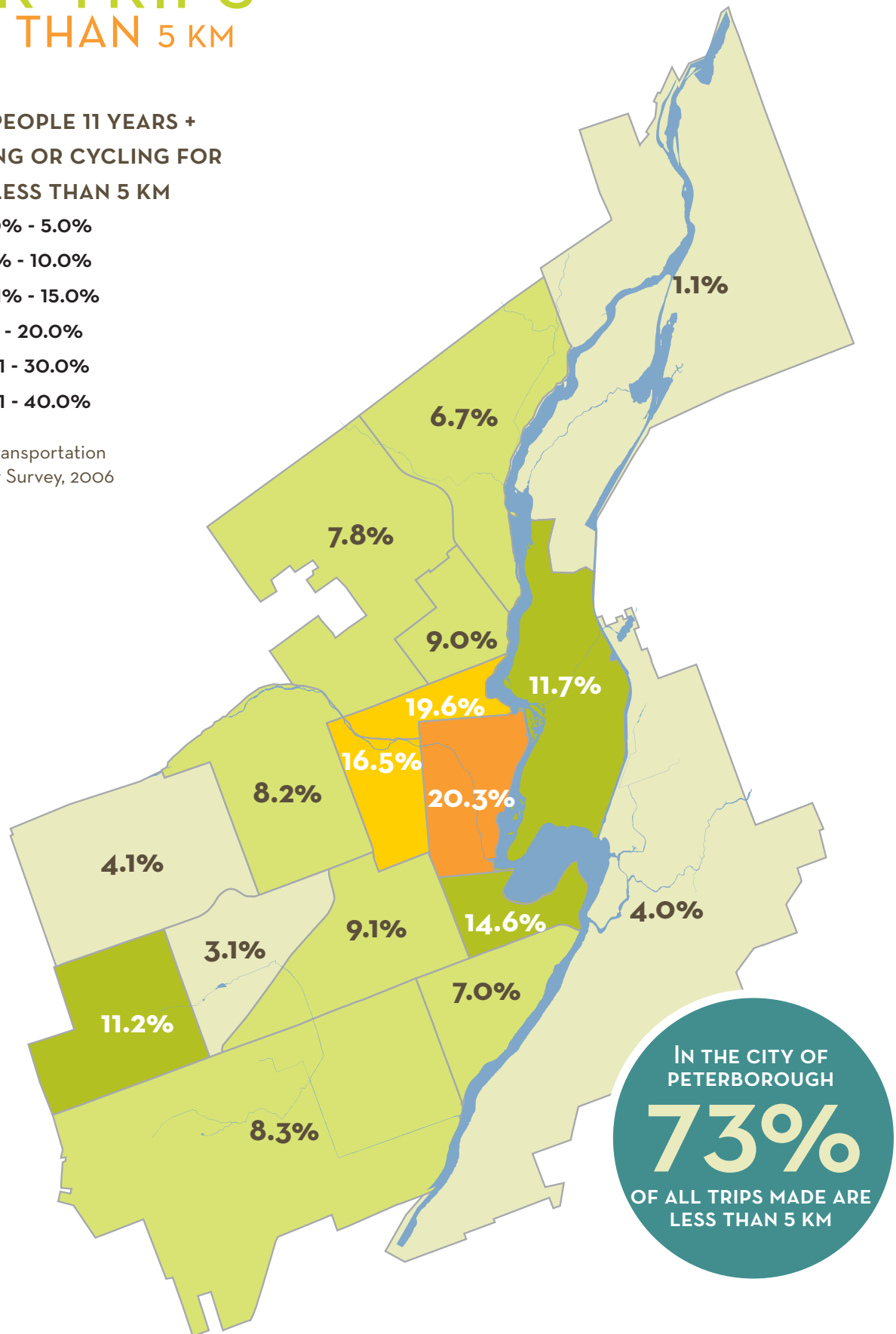
# A.T. RATES FOR TRIPS LESS THAN 5 KM

City of Peterborough

% OF PEOPLE 11 YEARS +  
WALKING OR CYCLING FOR  
TRIPS LESS THAN 5 KM



Source: Transportation  
Tomorrow Survey, 2006

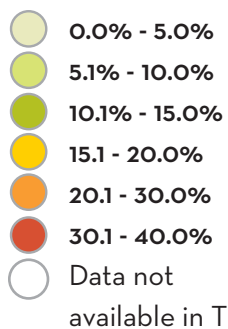


IN THE CITY OF  
PETERBOROUGH  
**73%**  
OF ALL TRIPS MADE ARE  
LESS THAN 5 KM

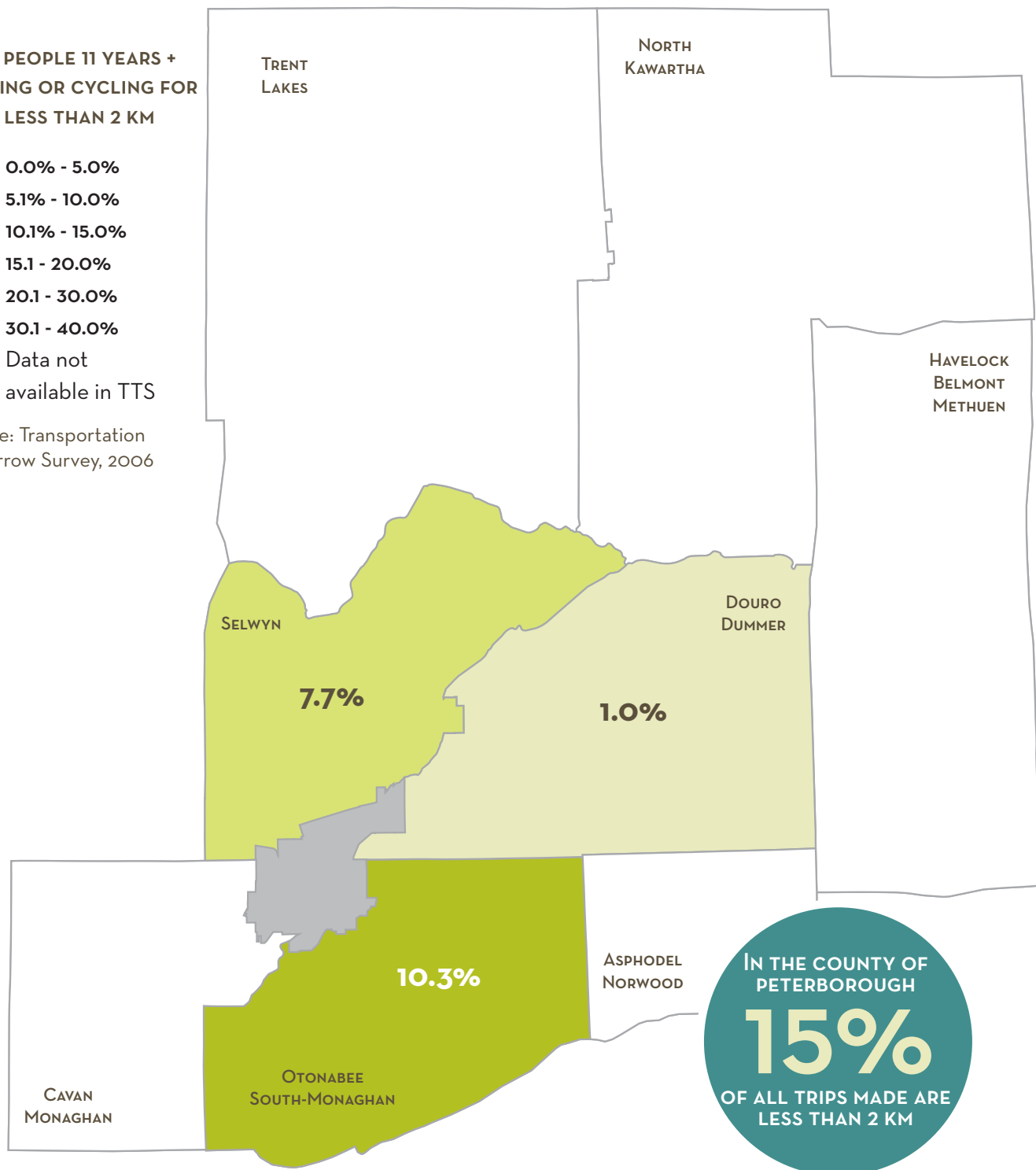
# A.T. RATES FOR TRIPS LESS THAN 2 KM

County of Peterborough

% OF PEOPLE 11 YEARS +  
WALKING OR CYCLING FOR  
TRIPS LESS THAN 2 KM



Source: Transportation  
Tomorrow Survey, 2006

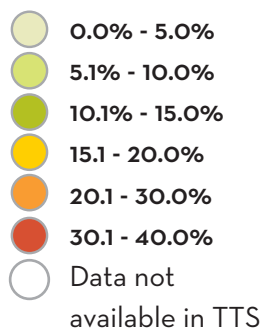


IN THE COUNTY OF  
PETERBOROUGH  
**15%**  
OF ALL TRIPS MADE ARE  
LESS THAN 2 KM

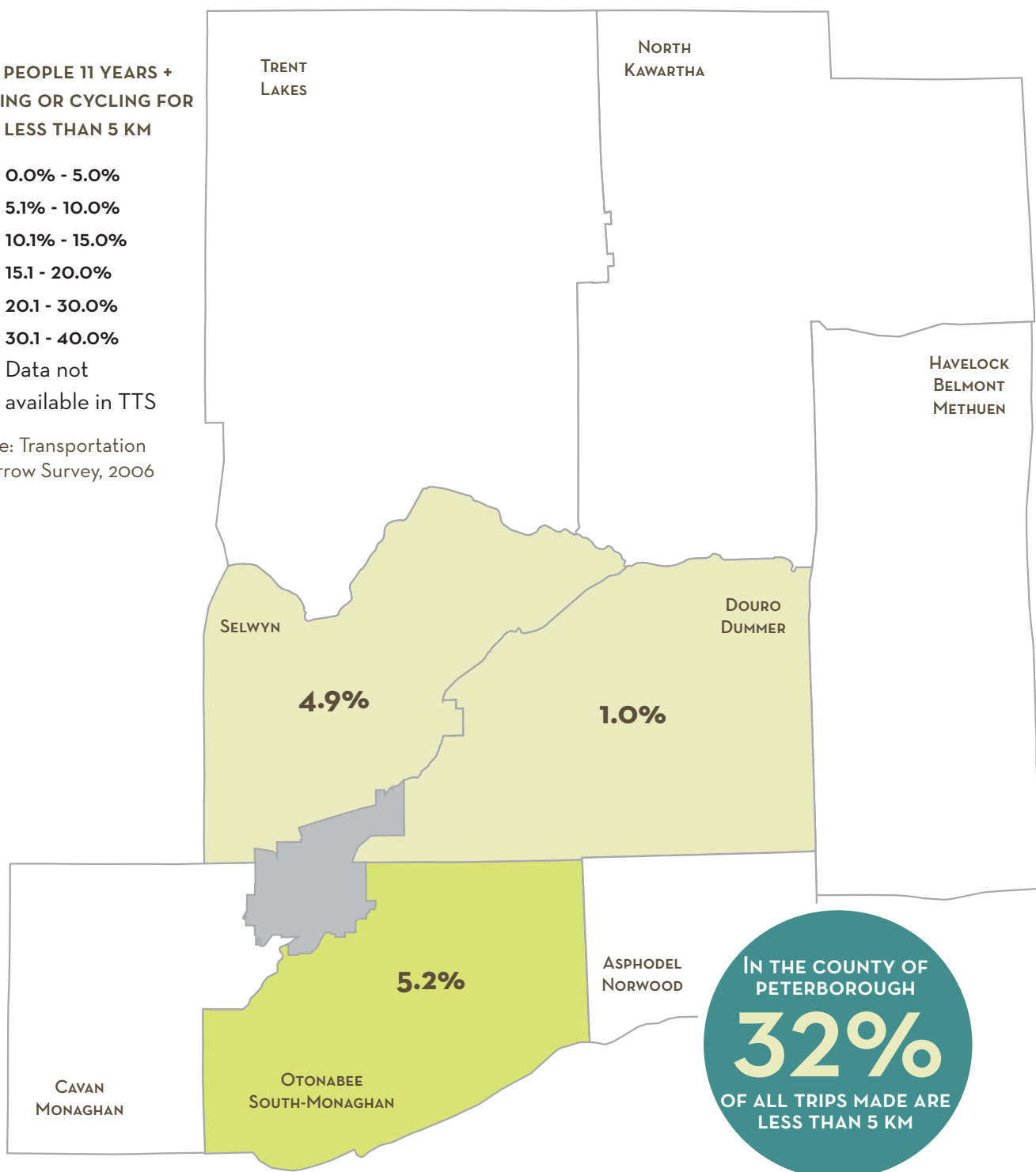
# A.T. RATES FOR TRIPS LESS THAN 5 KM

County of Peterborough

% OF PEOPLE 11 YEARS +  
WALKING OR CYCLING FOR  
TRIPS LESS THAN 5 KM



Source: Transportation  
Tomorrow Survey, 2006



IN THE COUNTY OF  
PETERBOROUGH  
**32%**  
OF ALL TRIPS MADE ARE  
LESS THAN 5 KM

In the City of Peterborough, 28% of all trips made are less than 2 kilometers while 73% of all trips made are within 5 kilometers. In the County, 15% of trips are within 2 kilometers and 32% of trips are within 5 kilometers. However, the percentage of residents already using active transportation for trips less than 2 or 5 kilometers is highly influenced by where they live. Persons residing in and around the downtown are the most likely to be using active modes of transportation for short trips, while persons in the south-east and north-east of the City are the most likely to drive for trips within a suitable walking or cycling distance.

There are a number of factors that are likely to contribute to this trend, including:

- Demographics: the downtown area has the largest percentage of persons between the ages of 15 and 30 years;
- Block size and crossings: the downtown has smaller and more compact street blocks and more frequent pedestrian crossings, which contribute to a more pedestrian-friendly experience;
- Frontage and furniture: sidewalks in the downtown are more likely to have street furniture such as benches, as well as defined and visually stimulating frontage zones, which contribute to a more engaging and human-scaled experience;
- Land-use mix: land-use patterns are more mixed in the downtown, providing destinations in close proximity to origins and allowing for a greater variety of trips within a short distance; and,
- Availability of parking: residential and commercial parking is more generous, and often free-of-charge, outside of the downtown core.

However, it is also likely that the presence or absence of supportive infrastructure has an influence on the likelihood that someone will choose to walk or cycle for both personal and work-related trips. Chapter Three will discuss infrastructure developments designed to support walking and cycling, as well as services to support transit use.

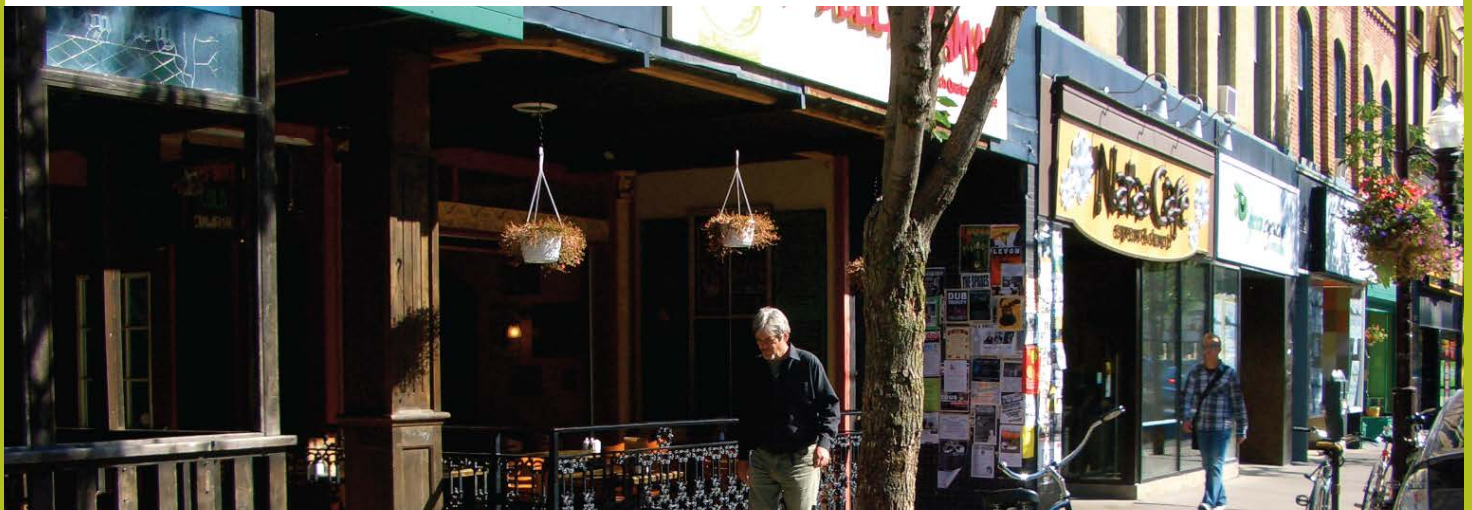


Photo Credit: Susan Sauvé





# CHAPTER THREE

## TRANSPORTATION INFRASTRUCTURE, & SERVICES

*Jane Jacobs, one of the earliest and best known advocates for walkable communities, said that lively and active streets play an essential role in the formation of communities. The social benefits of walkable and bikeable spaces are particularly essential for children, who - unable to drive - are isolated in an environment that does not enable unassisted travel.*



Photo Credit: PCCHU

Along with the factors discussed in Chapter One, transportation infrastructure has a major impact on rates of active transportation. Pedestrians, cyclists, and transit users often avoid roads where they feel vulnerable. Or, where they have a choice, will elect to drive instead. This chapter explores how existing infrastructure within the City and County informs the experiences of pedestrians, cyclists, and transit riders, and evaluates the level of service being provided by that infrastructure.



# PEDESTRIAN INFRASTRUCTURE

## WALKING FACILITIES

A well-connected network of sidewalks and trails supports and protects pedestrians of all ages and abilities. Children, older adults, and persons with disabilities traditionally walk more than other segments of the population and often do not have alternative modes of transportation available. For all pedestrians, and vulnerable populations in particular, sidewalks provide an essential refuge and contribute to increased safety and comfort (AASHTO 2004).

### CITY

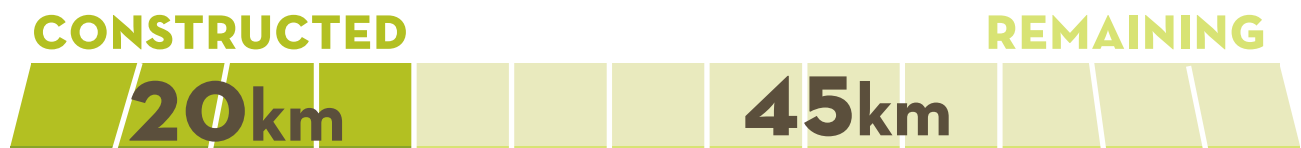
Since 2002, the City has had a comprehensive Sidewalk Policy in place to ensure that the development of sidewalks is prioritized. This Policy requires that sidewalks be provided on both sides of all new and reconstructed streets. The neighbourhoods built since 2002 are more walkable compared to developments implemented prior to the Policy, when sidewalks were often not provided. This Sidewalk Policy is integral to supporting walking within the City over the longer term. With the exception of one project in the City's north end, the City has adhered to this policy since 2002.

Still, there are significant gaps in the City's sidewalk network in many suburban neighbourhoods: a legacy associated with years of development when sidewalks were not required. Some gaps are on one side of the street and some are on both. The presence of a sidewalk on one side of the street creates challenges if pedestrians, particularly children or other vulnerable users, cannot easily or safely cross the road to get to the sidewalk. Ability to cross the road is a function of physical and cognitive ability as well as street width and traffic volume.

To address gaps in the existing network, the City of Peterborough adopted a Sidewalk Strategic Plan (SSP) in 2008. In the SSP, all missing sidewalks are identified and rated using a set of criteria that reflect projected pedestrian demand and the character of the road. Specific criteria include: the type of road; whether it is on a transit route; if there is a visible beaten path on the side of the road, etc. Consideration was given to land uses and pedestrian traffic in the development of criteria, recognizing that children and seniors are vulnerable age groups.

The SSP, as approved, calls for implementation of Priority 1 and 2 sidewalks by 2022. Between 2009 and 2013, close to one-third of Priority 1 and 2 sidewalks were built. At this rate of progress, most Priority 1 and 2 sidewalks will be constructed by 2022 as set out in the SSP.

### *Sidewalk Strategic Plan Implementation Progress, Priorities 1 & 2*



Source: City of Peterborough, 2013, Personal Correspondence

## The challenges associated with the construction of sidewalks in an area that is already developed include:

- Difficulty building retroactively due to physical constraints along the road;
- Additional expenses and disruptions to retrofit sidewalks rather than installing them at the time of development;
- Taxpayers across the City are required bear the full cost of retrofitting sidewalks rather than the new home buyer in the specific development; and,
- Increased resistance from adjacent property owners when retrofit sidewalks are installed.



Photo Credit: Susan Sauvé

## COUNTY

Most sidewalks in the County are only provided in settled areas. Some villages and towns have extensive sidewalk networks, while others have few.

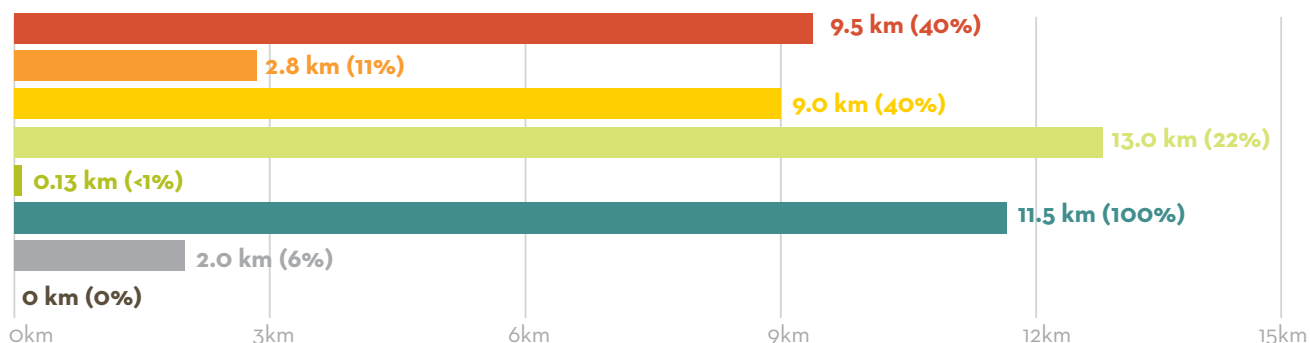
## SIDEWALK DEVELOPMENT

### County of Peterborough

For comparison, the total length of roadways in settled areas (towns, villages, etc.) is provided in parentheses:

● ASPHODEL-NORWOOD (23.5 km of roads)	● DOURO-DUMMER (18.1 km of roads)
● OTONABEE-SOUTH MONAGHAN (26.1 km of roads)	● HAVELOCK-BELMONT-METHUEN (10.2 km of roads)
● CAVAN MONAGHAN (22.5 km of roads)	● NORTH KAWARTHA (35.2 km of roads)
● SELWYN (59.2 km of roads)	● TRENT LAKES (23.5 km of roads)

The percentage of roadways in settled areas with sidewalks is provided in parentheses:



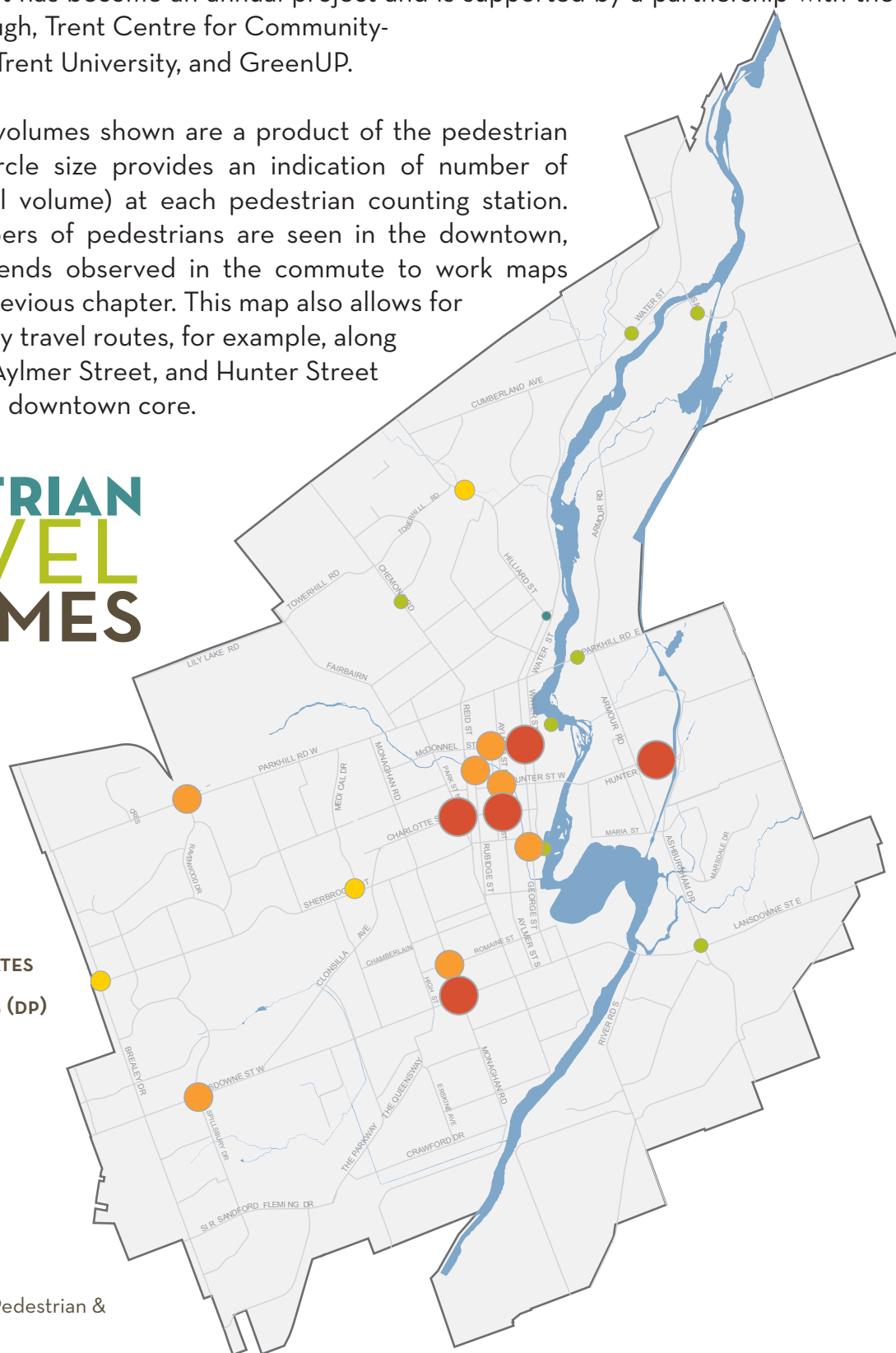


To better understand pedestrian and cyclist patterns in the City, and to connect usage patterns to infrastructure development, a local (yearly) count project was initiated in 2012. During peak weekday commuter periods over two days in September, pedestrians and cyclists are counted at 24 locations across the City. The information helps to identify pedestrian and cyclist corridors, to track travel trends over time, and to evaluate active transportation network efficacy. The count has become an annual project and is supported by a partnership with the City of Peterborough, Trent Centre for Community-Based Education, Trent University, and GreenUP.

Pedestrian travel volumes shown are a product of the pedestrian count project. Circle size provides an indication of number of pedestrians (travel volume) at each pedestrian counting station. The highest numbers of pedestrians are seen in the downtown, which confirms trends observed in the commute to work maps displayed in the previous chapter. This map also allows for identification of key travel routes, for example, along Charlotte Street, Aylmer Street, and Hunter Street into and within the downtown core.

## PEDESTRIAN TRAVEL VOLUMES

SIZE OF CIRCLE INDICATES  
AVERAGE VOLUME  
OF DAILY PEDESTRIANS (DP)



Source: Peterborough Pedestrian & Cyclist Counts, 2013

## SIDEWALK QUALITY

While the presence of sidewalks is essential, the quality and character of those sidewalks can also have a significant influence on how safe and comfortable pedestrians feel when walking. Sidewalk quality is influenced by level of service factors such as accessibility and physical condition.

### LEVEL OF SERVICE RATING

A level of service rating, which has traditionally been used to measure congestion for motor vehicles, is a concept that can also be applied more broadly to assess how well infrastructure is serving the needs of non-motorized travelers such as pedestrians or cyclists. Factors influencing pedestrian level of service could include proximity measures, features of the built form, maintenance quality, or presence of supportive signals, signage, and resources.

### CURB-FACE SIDEWALKS

One of the factors that has an immediate influence on pedestrian comfort and perceived safety is the proximity of the sidewalk to moving motor vehicle traffic. Curb-face sidewalks are those sidewalks immediately adjacent to a road. These sidewalks are a concern not only because there is little buffer between pedestrians and vehicles, making pedestrians feel more vulnerable, but also because these sidewalks can quickly fill with snow from the roads in winter. In recognition of the safety concerns and maintenance challenges associated with curb-face sidewalks, the City of Peterborough now avoids construction of these sidewalks whenever possible.



**% SIDEWALKS  
IMMEDIATELY BESIDE THE ROAD**



**19%**

Photo Credit: Susan Sauvé

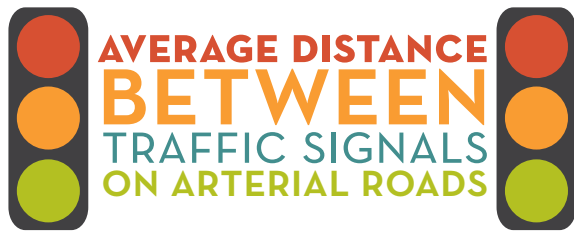
### ROAD PATTERN

Other factors, such as distance between traffic signals or between blocks on arterial roads, are an indication of how easily or safely a pedestrian can cross a road to reach their destination. Shorter blocks and frequent opportunities to cross are often an indicator of an area that is more dense and walkable.

Length of time provided for pedestrians to cross at a signalized intersection also contributes to a more accessible walking environment. Longer pedestrian crossing times allow pedestrians who are traveling at slower speeds, such as older adults and children, to continue traveling at a pace that is comfortable for them, rather than having to rush through intersections. In recognition of the high proportion of seniors living in the City of Peterborough, average crossing time provided at traffic signals is greater than the standard used by many municipalities across the province.

# SIDEWALK LEVEL OF SERVICE FACTORS

Factors and conditions that influence the experience of pedestrians in the City of Peterborough...



AVERAGE DISTANCE  
BETWEEN  
TRAFFIC SIGNALS  
ON ARTERIAL ROADS

288.1m

TO SUPPORT CONNECTIVITY FOR PEDESTRIANS, A TARGET FOR CROSSING FREQUENCY SHOULD BE:

61m - 91m  
(200ft) (300ft)

Source: New York City 2010, Institute of Transportation Engineers 2010



% OF SIDEWALKS WITH  
SHADE TREE  
COVERAGE  
21%



CROSSING  
GUARDS AT  
35 LOCATIONS  
ACROSS THE CITY



PRESENCE OF:

3

EXISTING

PEDESTRIAN REFUGE ISLANDS



1.0m/sec  
(STANDARD = 1.2m/sec)

Source: City of Peterborough, 2013  
Personal Correspondence

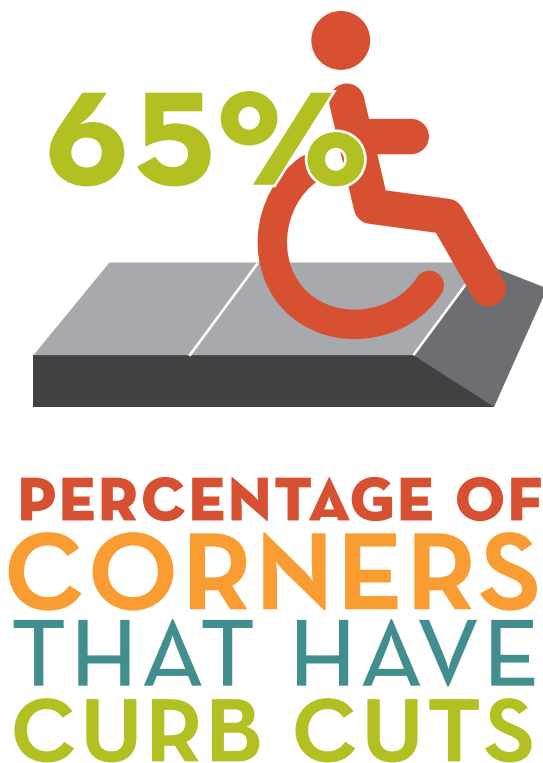
## ACCESSIBILITY

While it is important that sidewalks meet the needs of all walkers, they are also often the facility of choice for persons using assisted-mobility devices, such as wheelchairs and walkers. In recognition of the need for fully accessible facilities, the City of Peterborough has been working towards increasing the number of sidewalks that provide barrier-free access, with curb ramps at intersections being a critical requirement. As of 2012, 65% of corners have curb cuts, which allow wheeled devices to roll from the road onto the sidewalk without being lifted. However, in many areas these curb cuts do not meet the most recent standards for accessibility, being too steep a grade or having too high a lip along the curb, and in these cases the sidewalks will be prioritized for upgrades.

Auditory signals have a locator sound built into the pedestrian button, and they provide auditory walking instructions when the button is pressed for more than 3 seconds. They are used to assist people with vision loss or blindness when crossing signalized intersections. These auditory signals will soon be required in new installations under the Accessibility for Ontarians with Disabilities Act (AODA).

## SIDEWALK ACCESSIBILITY

*Factors and conditions that influence the accessibility of sidewalks in the City of Peterborough...*



## NUMBER OF AUDITORY TRAFFIC SIGNALS



Source: City of Peterborough, 2013, Personal Correspondence



## CONDITION

The Province of Ontario has established minimum maintenance standards for roads and sidewalks. While the majority of these standards focus on roads, municipalities are now required to annually inspect sidewalks for variations in height of over 2 cm that can create trip hazards. Locations where these infrastructure issues are identified must be marked and/or fixed within 14 days. In the City of Peterborough, one year of inspection has been completed.

In the City of  
Peterborough  
there are  
**1.15**  
**REPAIRS**  
**REQUIRED**  
per 100m  
of sidewalk



Photo Credit: PCCHU

# CYCLING INFRASTRUCTURE

## CYCLING FACILITIES

### CITY

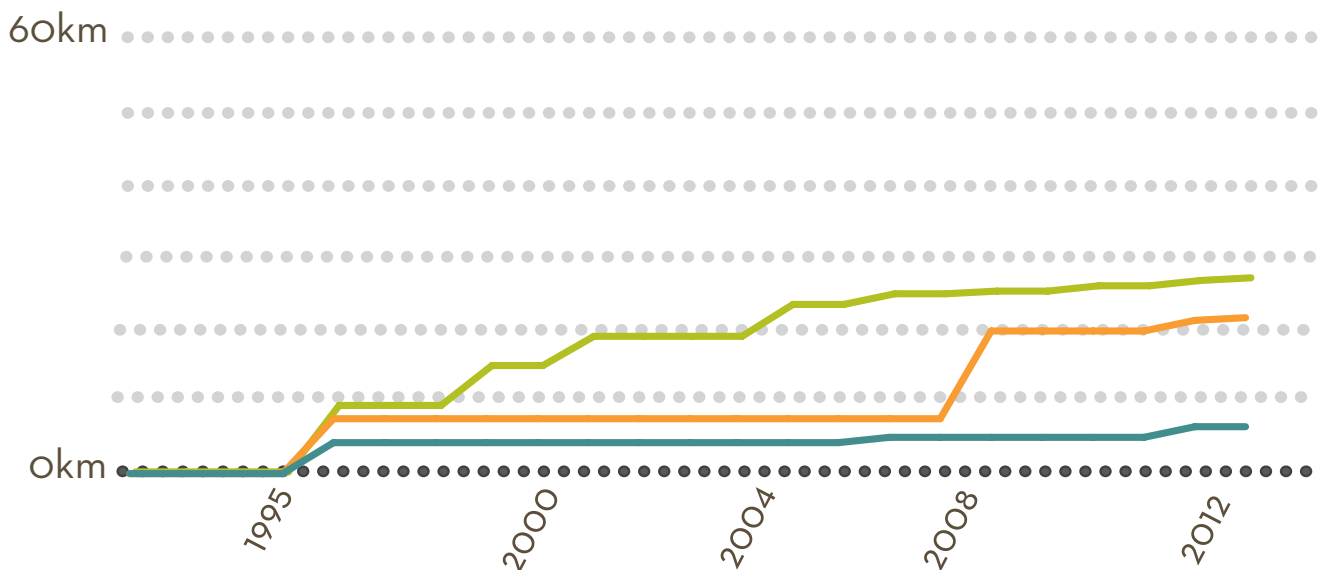
The City presently has 58 kilometers of cycling facilities. The facilities include off-road multi-use trails, trails beside the road and on-road bike lanes - shown on the adjacent page. Growth of these facilities has been steady over the last 20 years, with a particular increase in on-road cycling facilities over the last 6 years. The 2012 Comprehensive Transportation Plan recommends expansion of the cycling network to improve linkages between trails and to better accommodate cyclists on arterial and collector roads. The proposed cycling network calls for an additional 83 km of on-road and 48 km of off-road cycling facilities. The cost of these projects is estimated at \$24-33 million and they are expected to be implemented between 2012 and 2031.



Photo Credit: Susan Sauvé

## CYCLING FACILITIES DEVELOPMENT TIMELINE

*City of Peterborough*



Source: City of Peterborough, 2013, Personal Correspondence

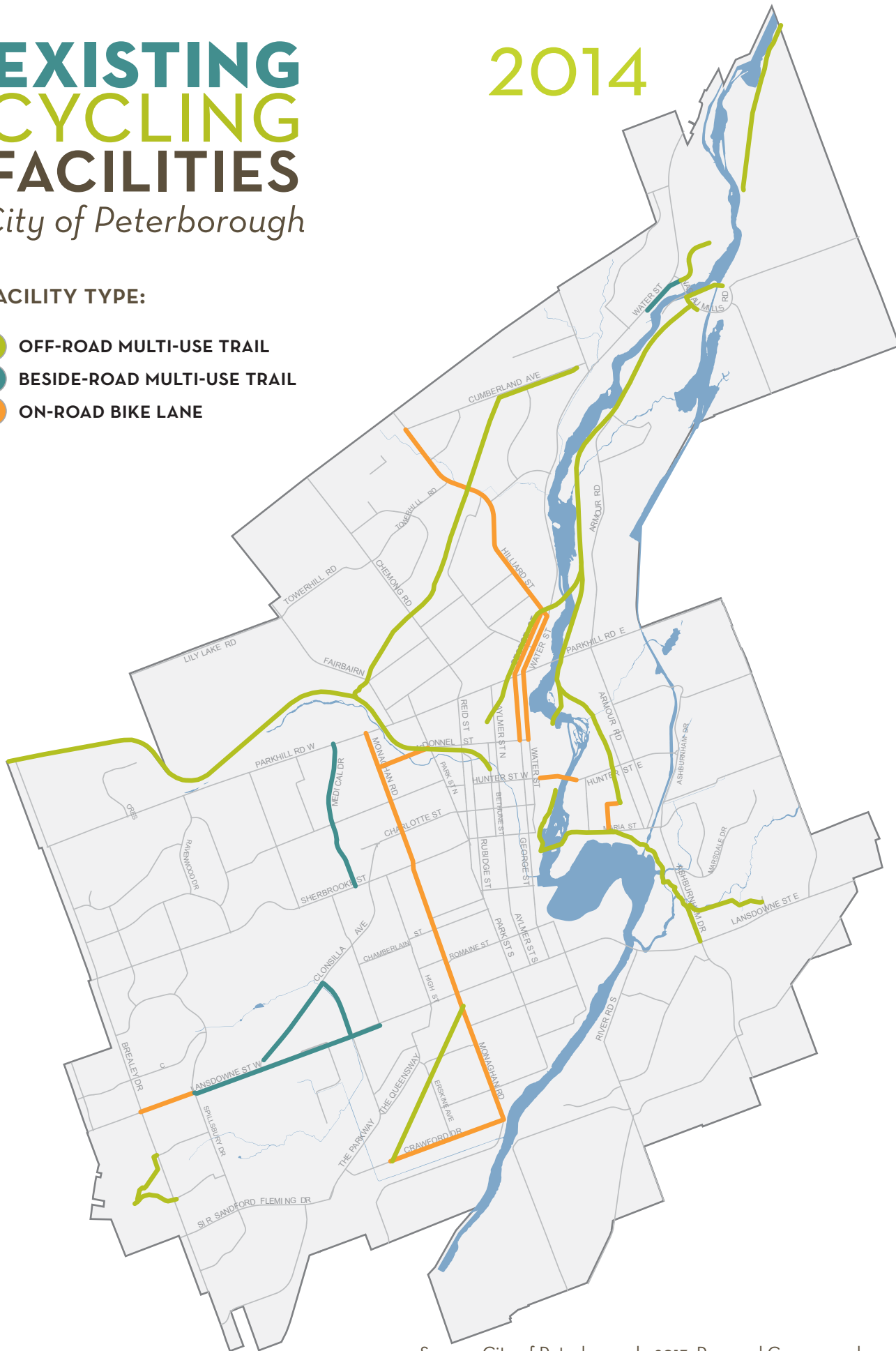
# EXISTING CYCLING FACILITIES

*City of Peterborough*

2014

## FACILITY TYPE:

- OFF-ROAD MULTI-USE TRAIL
- BESIDE-ROAD MULTI-USE TRAIL
- ON-ROAD BIKE LANE



Source: City of Peterborough, 2013, Personal Correspondence

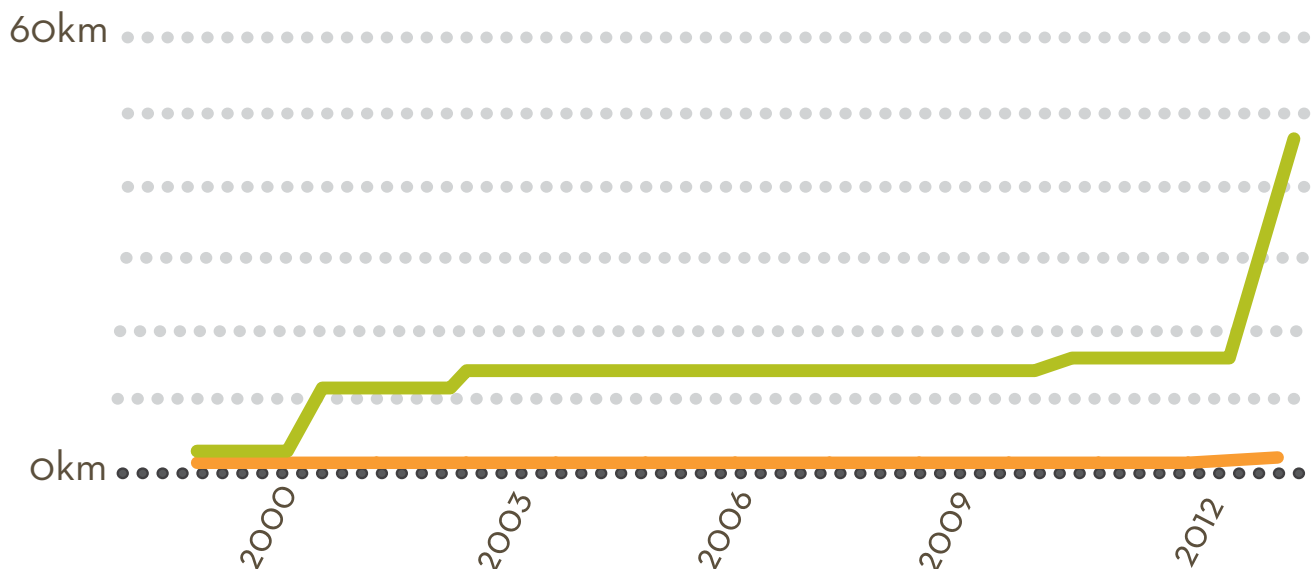


## COUNTY

Some cycling-specific facilities have been developed in the County as well, with major gains realized in 2012. Specifically, 2012 saw the construction of the Trans-Canada Trail to Hastings and the County's first bike lane constructed on County Road 134 - Heritage Line. In both the City and the County, local private donors and service clubs have been instrumental in funding the development of multi-use trails in place today. The County's newly approved Transportation Plan calls for the development of an Active Transportation Plan. An Active Transportation Plan typically identifies priorities for infrastructure and program development to support active transportation. Targets are often set for rates of walking and cycling, as well as reductions in collisions and injuries.

# CYCLING FACILITIES DEVELOPMENT TIMELINE

## County of Peterborough



Source: County of Peterborough, 2013, Personal Correspondence

- 2000 **ROTARY TRAIL, PETERBOROUGH TO LAKEFIELD** 6 km
- 2000 **VILLAGE OF LAKEFIELD TRAILS** 5.5 km
- 2002 **TCT, PETERBOROUGH TO CITY OF KAWARTHA LAKES** 3.6 km
- 2010 **ROTARY TRAIL, PETERBOROUGH TO BRIDGENORTH** 2.4 km
- 2012 **TCT, LANG TO HASTINGS** 30 km
- 2012 **COUNTY RD. 134, HERITAGE LINE** 0.5 km

*Share the Road* signs have also been placed along the 7th Line through to Hwy 29, near the Bridgenorth Trail in Selwyn Township



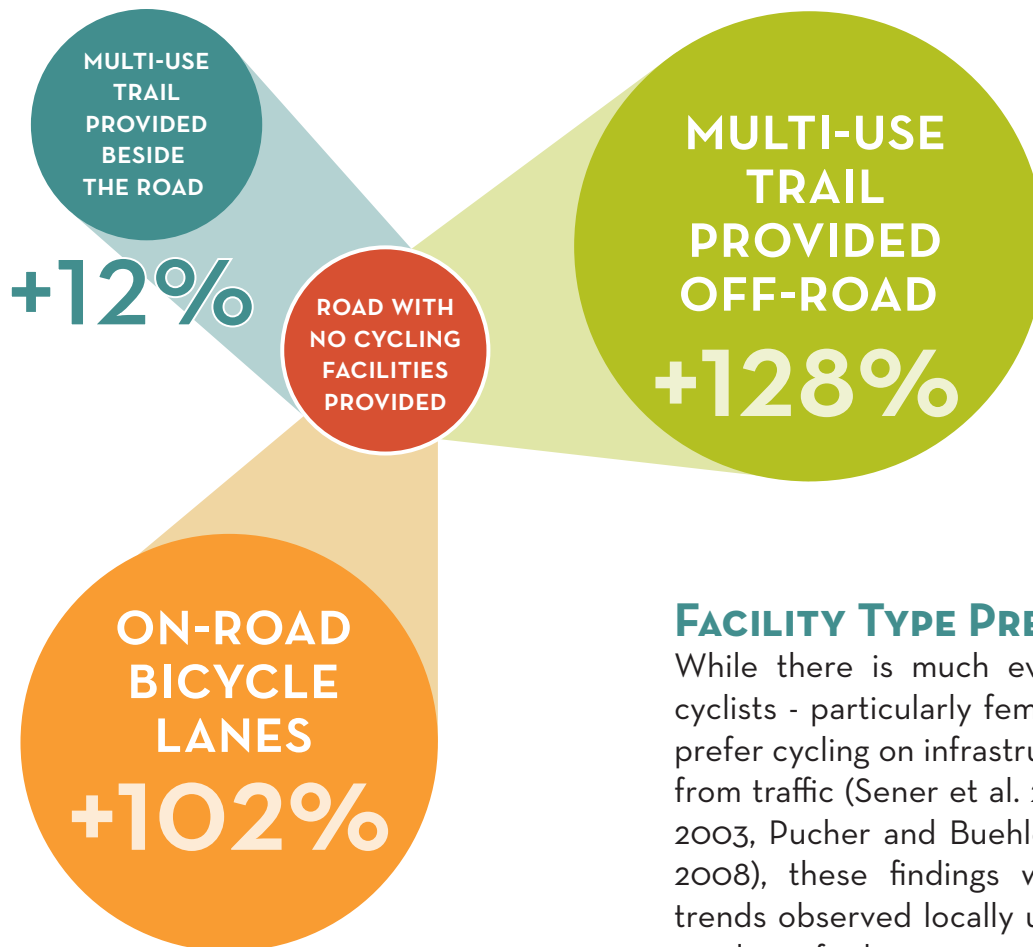
Photo Credit: PCCHU



# CYCLING RATES BY FACILITY TYPE

*In 2012 & 2013, bicycle counts were undertaken at 24 intersections across Peterborough...*

*The following graphic indicates the % growth observed in the number of cyclists when various cycling facility types are implemented*



*In addition to an increase in the overall usage rates when cycling-specific facilities are developed, an increase in the share of women who are cycling on bike lanes and trails is also observed:*

**ON ROAD 23%**  
**IN A BIKE LANE 28%**  
**ON A TRAIL 33%**

## FACILITY TYPE PREFERENCE

While there is much evidence indicating that cyclists - particularly female and older cyclists - prefer cycling on infrastructure that is separated from traffic (Sener et al. 2009, Stinson and Bhat 2003, Pucher and Buehler 2008, Garrard et al. 2008), these findings were not grounded in trends observed locally until fairly recently. The results of the 2012 and 2013 Bicycle and Pedestrian Counts express the type of facility a cyclist is riding on, and can therefore be used to identify local routes selected by cyclists. Local results confirm findings from other communities: Peterborough cyclists show a strong preference for off-road multi-use paths, and they also show a preference for on-road bicycle lanes. In both 2012 and 2013, three of the top four most frequented cycling routes were along multi-use trails.

Source: Peterborough Pedestrian & Cyclist Counts, 2013



*In North America, cycling facilities are evolving with a better understanding of the needs of users. New facilities, whenever possible, aim to separate vehicles from bicycles and bicycles from pedestrians. Cycling tracks are one way to do this. Cycling tracks are like a bike lane but provide physical separation from vehicle travel lanes.*

*This photo was taken on Dunsmuir St. in Vancouver, British Columbia.*

Photo Credit: Paul Krueger

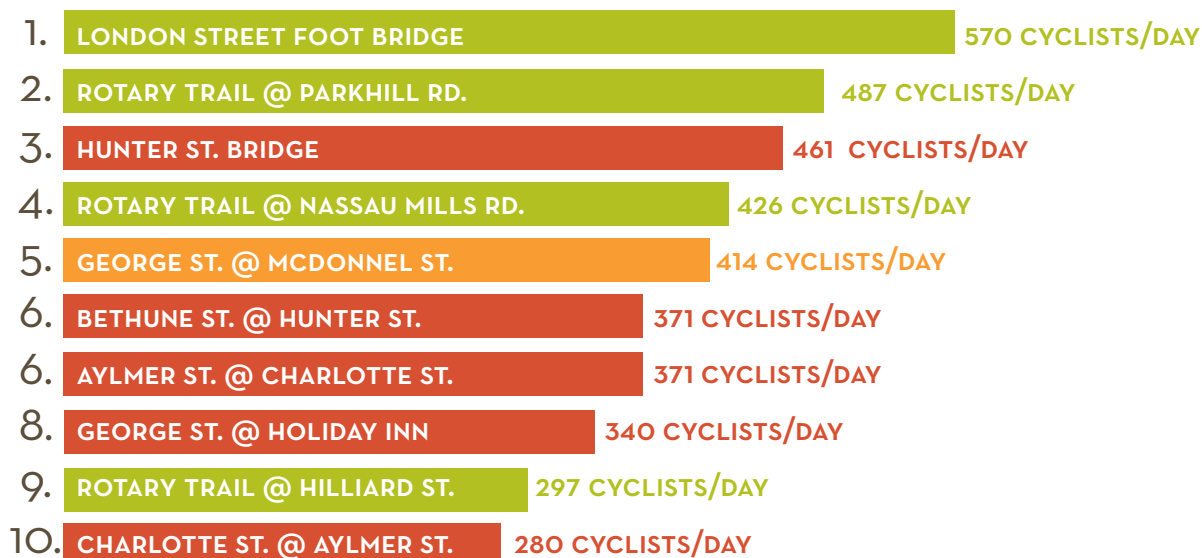
The data provided by the Peterborough Pedestrian and Cyclist Counts are particularly relevant for local planners and engineers seeking to design cycling facilities that attract cyclists of all ages and abilities. Although dedicated cycling facilities often require a larger initial investment, the potential for increased cycling mode shares, decreased injuries, increased tourism, and decreased congestion when these facilities are built, can be substantial.

## TOP 10 CYCLING CORRIDORS IN PETERBOROUGH

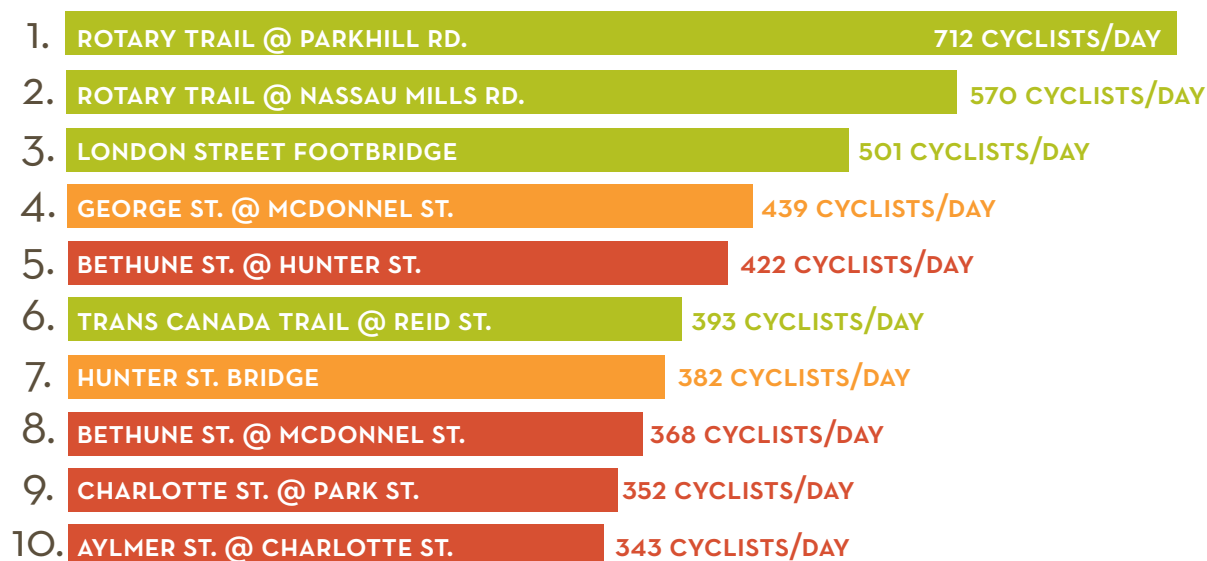
### FACILITY TYPE:

- OFF-ROAD MULTI-USE TRAIL
- BESIDE-ROAD MULTI-USE TRAIL
- ON-ROAD BIKE LANE
- NO CYCLING-SPECIFIC FACILITY

2012



2013



Source: Peterborough Pedestrian & Cyclist Counts, 2013



## Cycling is on the Rise!

- 36% of Ontarians cycle regularly
- 68% of Ontarians would prefer to cycle more often
- 70% of Ontarians believe that cyclists need more bike lanes or paved shoulders, and
- 78% believe that more people would cycle if there was more and better cycling infrastructure

Source: Share The Road 2013



Photo Credit: Susan Sauvé

# CYCLIST TRAVEL CONTOURS

## MAP FEATURES:

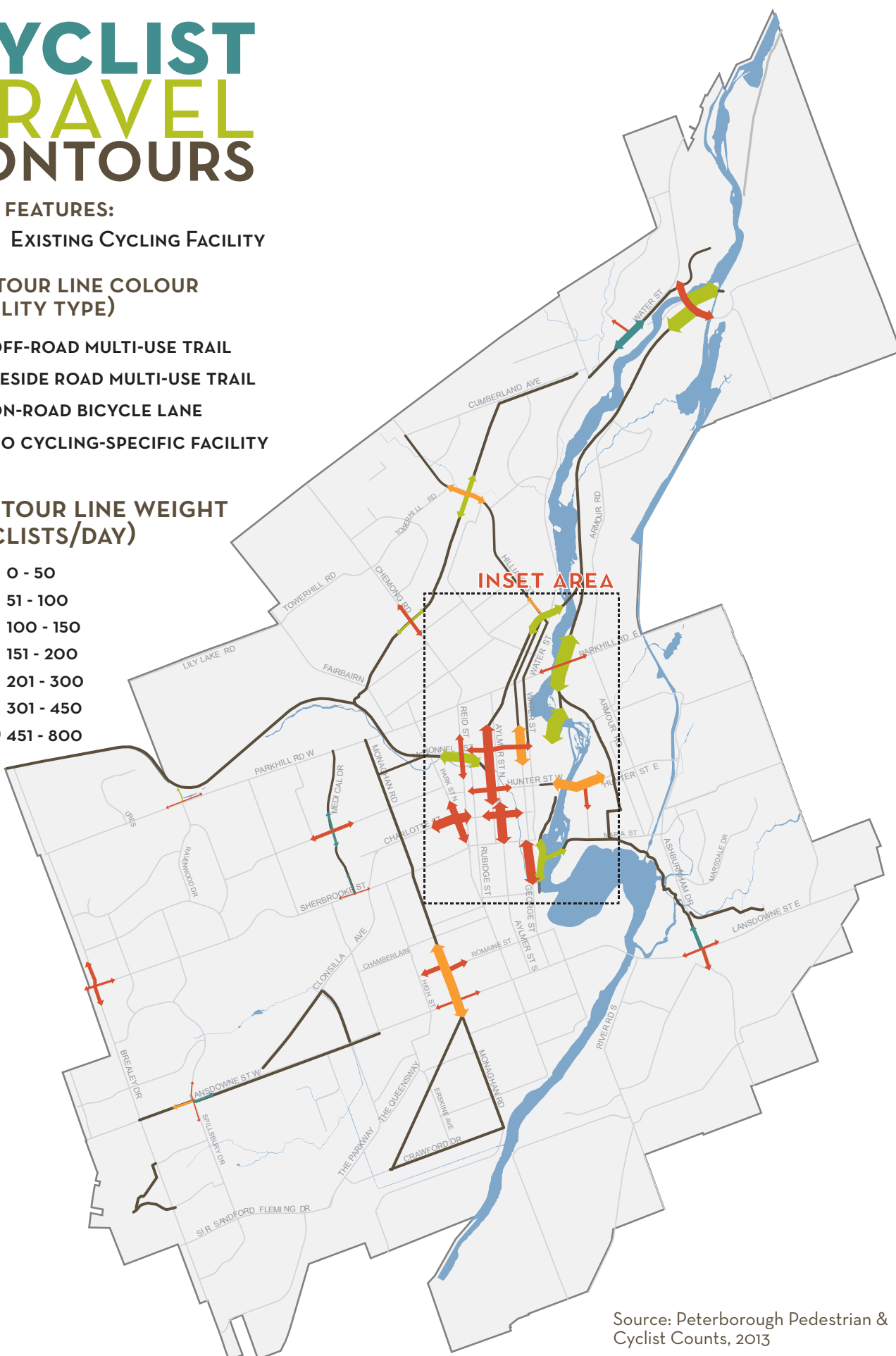
— EXISTING CYCLING FACILITY

## CONTOUR LINE COLOUR (FACILITY TYPE)

- OFF-ROAD MULTI-USE TRAIL
- BESIDE ROAD MULTI-USE TRAIL
- ON-ROAD BICYCLE LANE
- NO CYCLING-SPECIFIC FACILITY

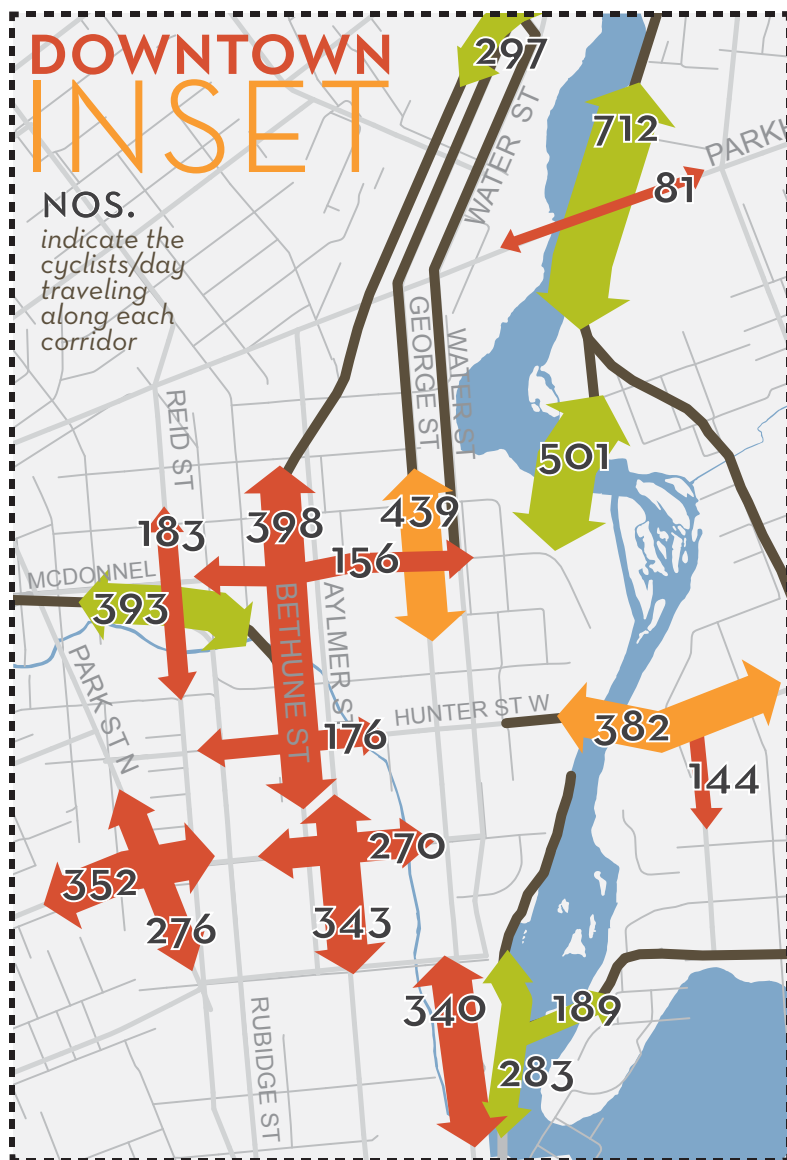
## CONTOUR LINE WEIGHT (CYCLISTS/DAY)

- 0 - 50
- 51 - 100
- 100 - 150
- 151 - 200
- 201 - 300
- 301 - 450
- 451 - 800



Source: Peterborough Pedestrian & Cyclist Counts, 2013



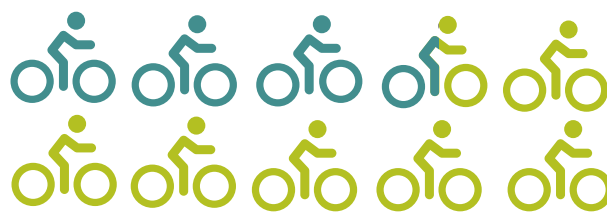


Cyclist travel contour maps highlight cyclist movements during peak commuter periods, and help to identify not only the usage rates for current facilities, but also areas where cyclists are presently riding without dedicated facilities on collector and arterial roads. In the downtown core, we can identify major cycling corridors entering the downtown area: Rotary Trail and George Street corridors from the northeast; Hunter Street Bridge corridor from the east; Aylmer and Bethune Streets from the north and south, and both Charlotte Street and the Trans Canada Trail from the west. On many of these primary cycling corridors, cyclists are without dedicated infrastructure. Although the development of cycling-specific facilities on many of these routes has been identified as a priority in the City's recent Comprehensive Transportation Master Plan Update, many cyclists using these routes have elected to ride on the sidewalk rather than sharing the road with motor vehicles. While not legal for adults, the Peterborough Pedestrian & Cyclist Counts indicate that 3.5 out of every 10 cyclists are riding on the sidewalk (2013).

## SIDEWALK CYCLISTS

In the City of Peterborough...

However...



# 3.5

out of every ten cyclists ride on the sidewalk



WHEN AN ON-ROAD CYCLING LANE IS INTRODUCED, THE NUMBER OF CYCLISTS ON THE SIDEWALK DECREASES BY

# 42%

Source: Peterborough Pedestrian & Cyclist Counts, 2013

## LEVEL OF SERVICE

In much the same way as sidewalks, the use of cycling facilities is influenced by a number of level of service factors. These include intersection treatment, facility continuity, facility servicing, and end of trip facilities such as bike parking.

## INTERSECTION TREATMENT

One of the primary factors influencing a cyclist's experience is intersection treatment. Intersections are often where cyclists are most vulnerable and where special provisions are of the greatest value. In Peterborough, there is presently one intersection with a cyclist-specific traffic signal, which cyclists can activate by rolling their bicycle over a ground sensor. Additionally, there are five local intersections that have some provisions made for cyclists, primarily the continuation of cycling lanes up to and/or through the intersection, which clearly delineates a safe path for cyclists. Most intersections in Peterborough do not have any cycling-specific treatments, leaving cyclists to navigate with traffic.



### CYCLIST-ACTIVATED TRAFFIC SIGNALS

#### ONE EXISTING:

1. Rotary Trail & Parkhill Rd.



**67%**  
**PED-ACTUATED  
SIGNALS**

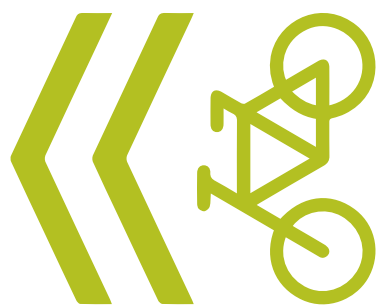


In the City, approximately 67% of traffic signals at intersections are actuated, which means the side street only gets a green light when the need is detected. The detection systems currently in place are designed to identify vehicles and pedestrians - not cyclists. This leaves cyclists with two choices: to wait for a car

to arrive and set off the detection loop or, if possible, to dismount and manually press the pedestrian crossing button. Providing reliable cyclist detection systems at intersections is a challenge that can be addressed as technology evolves. However, it is recognized that the frustration cyclists experience when delayed at these types of intersections can lead to illegal movements.

## FACILITY CONTINUITY

Facility continuity is also an element of level of service, and this factor has a significant impact on rates of cycling (Stinson and Bhat 2004, Heinen et al. 2010). While Peterborough's multi-use trail network is quite extensive, cyclists making purpose-driven trips, rather than recreational trips, will still need to use roads to access businesses or services. Only 8% of major streets currently have cycling-specific facilities in the City, and on some of these cycling lanes, vehicle parking is allowed for most of the day.



8%

**OF COLLECTOR  
AND ARTERIAL  
STREETS HAVE  
CYCLING-SPECIFIC FACILITIES**

Source: City of Peterborough, 2013, Personal Correspondence

## FACILITY SERVICING

Level of service facility enhancements can increase the feasibility of cycling both at night and in winter months. Six percent of City trails are lit, allowing for safe nighttime travel. In recent years, the City has begun plowing all paved multi-use trails to facilitate their use in winter. While this process is still being refined, the practice of plowing paved trails during winter months is quite progressive among Canadian municipalities.



Source: City of Peterborough, 2013, Personal Correspondence

## END OF TRIP FACILITIES

The provision of end of trip facilities can also have a bearing on perceived and actual cycling level of service. For example, the absence of secure bicycle parking is not only inconvenient for cyclists, but also represents a barrier to cycling as a viable mode of transportation. The City of Peterborough has been installing cycling racks throughout the downtown and at City facilities, with the rate of installation increasing significantly over the past eight years. Many of the City's largest private and educational institutions have installed a significant number of cycling racks, including Trent University, Lansdowne Place Mall, and Fleming College.

# BICYCLE PARKING

City of Peterborough

## MAJOR COMMERCIAL DISTRICTS & COMMUNITY FEATURES

- DOWNTOWN CORE (INCL. HUNTER STREET EAST)
- CHEMONG ROAD
- LANSLOWNE STREET WEST
- LANSLOWNE STREET EAST
-  MAJOR SHOPPING CENTRE
-  HIGH SCHOOL
-  POST-SECONDARY INSTITUTION
-  LARGE MUNICIPAL BUILDING

## # OF BIKE PARKING SPOTS AVAILABLE



Source: City of Peterborough 2013, Trent University 2012, Fleming College 2013 (All sources are Personal Correspondence)



## WAYFINDING AND MAPPING

Bicycle wayfinding and mapping tools can support the efficient use of existing infrastructure and can serve as an educational resource for new or less experienced cyclists looking to explore the community. In the City of Peterborough, the directional signage and trail map signs also include various points of interest.

In 2012, the first joint City and County cycling and trails map was developed. This map included not only cycling and trail facilities, but also a ranking of each County road based on bikeability. This map was a collaborative effort involving many community partners, and has been reviewed annually prior to reprinting. The Peterborough City and County Cycling and Trails Map is presently in its third edition.

## BICYCLE WAYFINDING RESOURCES



15

BIKEWAY & TRAIL  
MAP SIGNS

in the City of Peterborough

INCLUDING...

direction and distance to  
various points of interest



Wayfinding in the City and  
County of Peterborough....



BIKEWAY & TRAIL  
DIRECTIONAL SIGNS  
IN THE CITY OF PETERBOROUGH

& TRAIL & STREET NAMES  
AT ALL TRAIL INTERSECTIONS



TO DATE, MORE THAN:

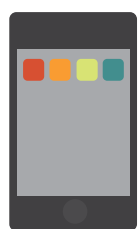
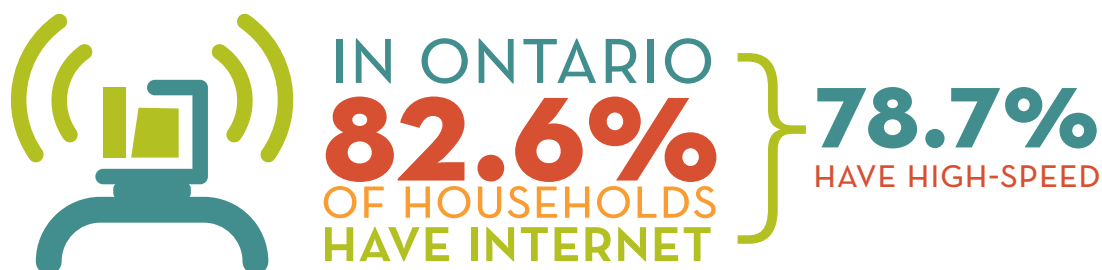
25,000 MAPS HAVE  
BEEN DISTRIBUTED

Source: City of Peterborough, 2013, Personal Correspondence

In addition to print resources, many of the cycling supportive resources available in the Peterborough region are online or are formatted for mobile devices. In Ontario, a large majority of households have internet and an increasing number of households also have a smartphone.

# ONLINE CYCLING RESOURCES

Online cycling resources for the  
City and County of Peterborough....



**83.9%**  
OF HOUSEHOLDS  
HAVE A CELL PHONE

AND THE % OF SMARTPHONE  
USERS INCREASED FROM:

**33%** TO **56%**  
IN EARLY 2012 IN EARLY 2013

Source: Survey of Household Spending, Statistics Canada, 2012; Our Mobile Planet: Canada, Google Inc., 2013

*Given this level of use, online cycling resources are essential. Maps as well as information about programs, laws, and policies are all available online.*

# BICYCLE MAINTENANCE RESOURCES

## MAINTENANCE RESOURCES

The prevalence of bicycle repair and maintenance services is an indicator of both the vibrancy of bike culture and the ability to own and operate a functioning bicycle. Most maintenance and repair services are available in downtown Peterborough, with one shop just outside of Lakefield.



THE CITY OF PETERBOROUGH  
INSTALLED FOUR PUBLIC  
**4 BICYCLE  
REPAIR STATIONS**  
IN 2012 & 2013

there are also...



**4 LOCAL BIKE  
RETAILERS &  
REPAIR SHOPS**

and...



**1 MEMBERSHIP-BASED  
COMMUNITY  
BIKE SHOP**

Source: City of Peterborough, 2013, Personal Correspondence

# BIKE SHARING

In the City of Peterborough, one of the principle barriers to cycling is bicycle ownership. While this barrier can be difficult to overcome for persons living on a low or limited income, bicycle sharing has emerged as an economical alternative to ownership in many communities. In Peterborough, B!KE: the Peterborough Community Cycling Hub has begun to offer a small bicycle library program that provides medium-term rentals for students and community members.



... each of whom either paid a \$60 annual membership or completed 4 hours per year of volunteer time.

IN 2013, THERE WERE  
**8 BIKES**  
IN THE SHARE

BIKES WERE IN USE  
**18% OF**  
THE TIME

BIKES ARE CURRENTLY  
**AVAILABLE AT**  
**3 LOCATIONS**

Source: B!KE: the Peterborough Community Bike Shop, 2013, Personal Correspondence

The weather was also identified as a primary deterrent. While this cannot be mitigated, systems that support inter-modal activities – such as riding to a bus station and putting one's bike on the bus – allow cyclists more flexibility during inclement weather. The option to travel using multiple modes can encourage cycling even when the weather is not as favourable or predictable. In Peterborough, none of the City transit vehicles currently allow for bicycles to be transported. However, for persons traveling out of town, GO Transit does have two bicycle racks on the front of all their buses departing from Peterborough-area stops. In addition to cycling-supportive transit systems, effective winter maintenance of cycling facilities can decrease the perception of weather as a barrier (Berstron and Magnusson 2003).



PETERBOROUGH  
**TRANSIT** 0%

GOTRANSIT 100%

GREYHOUND  
**INTER-CITY** 0%

Source: City of Peterborough, 2013;  
GO Transit, 2013;  
Greyhound Intercity, 2013  
(All sources are Personal Correspondence)

### *Peterborough Transit*

## TRANSIT SERVICE TIMELINE

**1893**

Peterborough & Ashburnham  
Street Rail Company established

**1984**

Trent U-Pass Program Established  
(only the 2nd U-Pass in Canada)

**2002**

Trent University  
West Bank Route established

**2004**

Trent University  
East Bank Route established

**2005**

Existing 12 regular transit  
routes were established

**2006**

Sunday service  
introduced on regular routes

**2011**

Trent University U-Pass  
becomes valid for 12 months

**1978**

Present-day Peterborough  
Transit established

**1996 - 2006**

Dial-a-Bus is only  
evening service available

**2008**

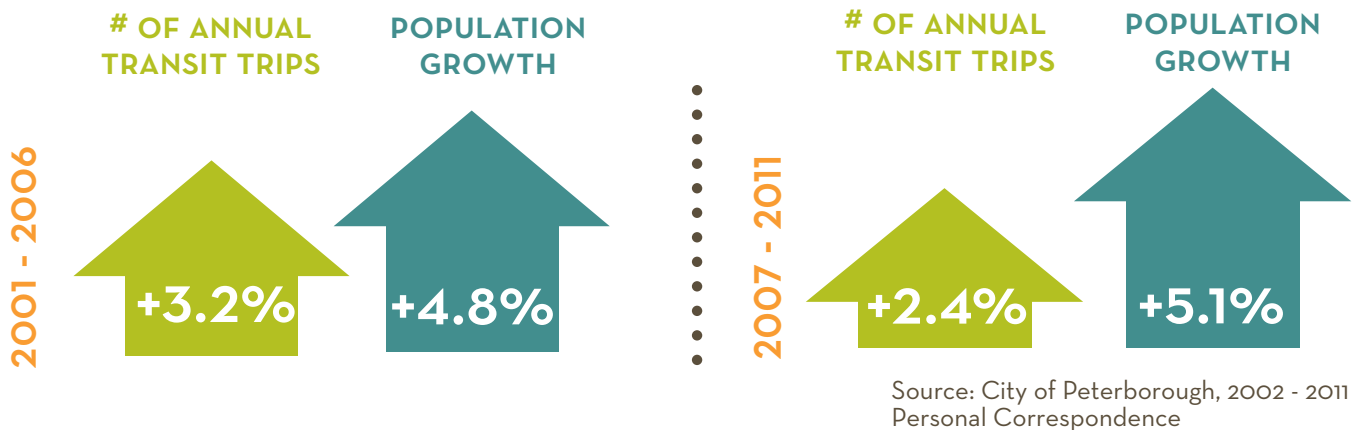
More than half the buses now  
low-floor accessible buses

Source: City of Peterborough, 2002 - 2011  
Personal Correspondence



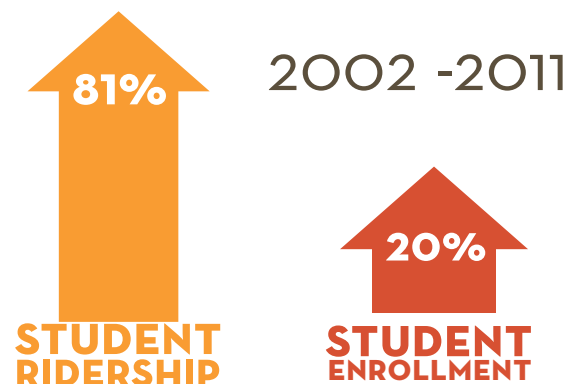
# TRANSIT RIDERSHIP OVER TIME

City of Peterborough

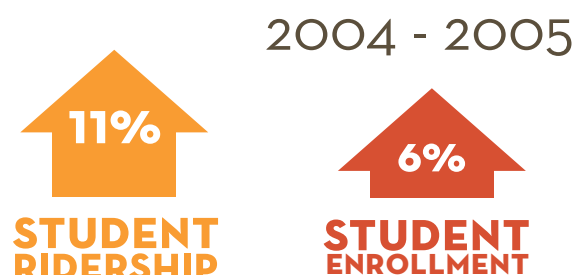


In the City of Peterborough, transit usage has not kept pace with population growth. However, if the Trent student population is used as an example of transit ridership trends, there is a much different pattern: growth in student ridership far exceeds growth in student enrollment. This is directly related to various implementation stages of the Trent U-Pass program, including the introduction of two distinct charter routes and the recent extension of the U-Pass to cover an entire 12-month period. Funds collected through the U-Pass program are used to fund additional routes serving Trent University. Because of this, service to Trent is much more frequent than service on regular routes. The base of ridership provided by Trent students contributes significantly to the overall success of the City of Peterborough transit system.

SINCE 2002, WHEN THE FIRST TRENT-SPECIFIC SERVICE WAS INTRODUCED ALONG THE **WEST BANK** THE FOLLOWING CHANGES IN RIDERSHIP WERE OBSERVED



IN 2004, WHEN TRENT **EAST BANK** SERVICE WAS INTRODUCED THE FOLLOWING CHANGES IN RIDERSHIP WERE OBSERVED



Source: City of Peterborough, 2002 - 2011 Personal Correspondence

## LEVEL OF SERVICE

Transit service was fairly consistent in the City until the mid-1990's when provincial subsidies declined substantially. Service reductions were instituted, resulting in a decline in ridership. Meanwhile, ridership was also beginning to drop as the suburbs of the City expanded and car ownership increased. A transit review was conducted in 2006 in response to concerns about service levels and reliability. Since then, service levels have increased as the recommendations have been implemented. The recommendations included the provision of regular evening service, Sunday service, route efficiencies and schedule adjustments to improve on-time reliability. Ridership has also increased as the recommendations have been implemented, but as demonstrated by the reduction in the share of trips using transit between 1996 and 2006, ridership growth has not kept pace with population growth, most of which has occurred in the suburban areas which are less densely populated and less supportive of transit.

The U-pass program at Trent University, one of the first in Canada, has been very successful, particularly since 2004 when the west bank express service was introduced. Express service to Fleming College, where there is no U-pass, is less frequent and represents an opportunity to increase transit use.

## TRANSIT LEVEL OF SERVICE FACTORS

*Factors and conditions that influence the experience of transit riders in the City of Peterborough...*

**26,000**  
MONTHLY PASSES  
SOLD IN 2013

**3,385,292**  
TRIPS MADE  
IN 2013

**GREENWAVE**  
PILOT PROJECT TO ACTIVATE  
GREEN LIGHTS  
AS BUSES APPROACH ON WATER ST.

**17** ROUTES

**622**  
TRANSIT  
STOPS

**75**  
TRANSIT  
SHELTERS

**96%**  
OF HOUSEHOLDS ARE  
WITHIN 400M  
OF A TRANSIT STOP

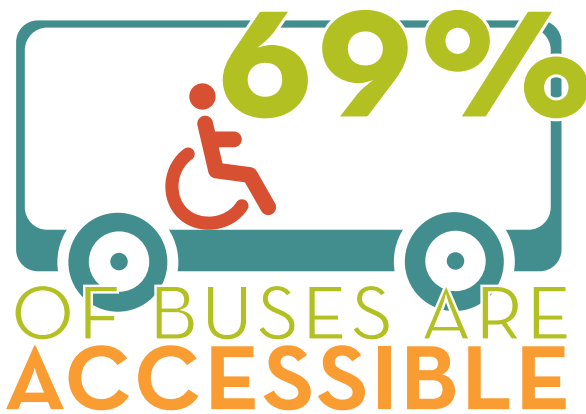
## ACCESSIBILITY

Substantial improvements were made in the area of transit accessibility over the last 20 years. In 1996, none of the regular transit buses were barrier-free and now all of the buses that run on regular routes are fully accessible. Approximately 69% of the fleet is now comprised of low floor buses with no steps and wide doors. Barrier-free buses are popular with all transit users because getting on and off the bus with shopping bags, strollers and walkers is much easier than with the older style buses. The benefits of enhanced accessibility extend well beyond the population of people with disabilities.

Door-to-door Handi-Van service is provided for people with mobility impairments, and service is provided at the same cost as conventional transit. The hours of service also mirror those provided for conventional transit. Handi-Van users must be pre-authorized and book each trip by telephone, up to a week in advance. Use of this service is in high demand and with seven vans in service each day, same day trip requests typically cannot be provided.

## TRANSIT ACCESSIBILITY

*Factors and conditions that  
influence the accessibility of transit  
in the City of Peterborough...*



PETERBOROUGH TRANSIT HAS  
**10** WHICH MAKE **36K**  
HANDI-VANS TRIPS PER YEAR

Source: City of Peterborough, 2002 - 2011  
Personal Correspondence



Photo Credit: Brianna Salmon



# INTER-CITY TRANSIT

## INTER-CITY TRANSIT SERVICES

A number of intercity transit services are available in the Peterborough region. The addition of GO Transit services in 2009 has increased the inter-city options available to residents. Inter-City transit services are frequent between Oshawa and Toronto, but service to Ottawa is infrequent and relatively costly. Services to other common destinations such as Lindsay, Cobourg, Port Hope, Kingston and Belleville are not available.

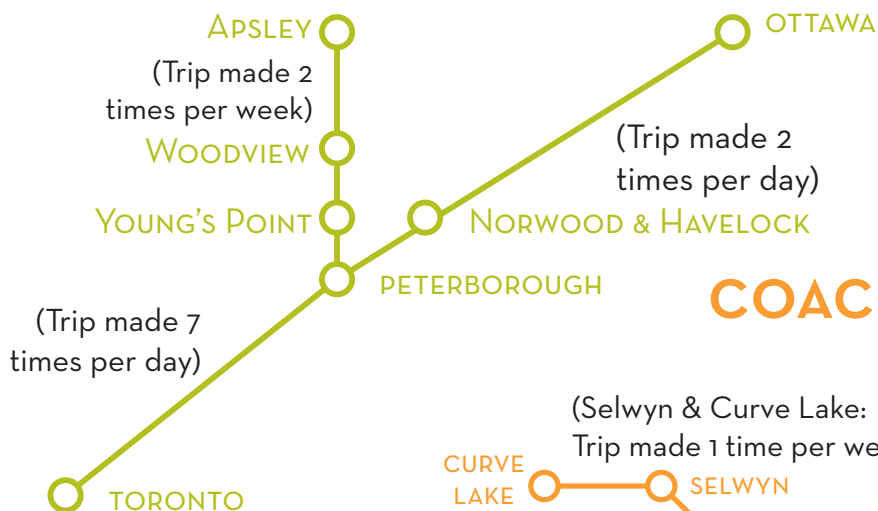
### INTERCITY TRANSIT SERVICE

*The City of Peterborough has three inter-city transit providers. They provide limited service to the following destinations:*

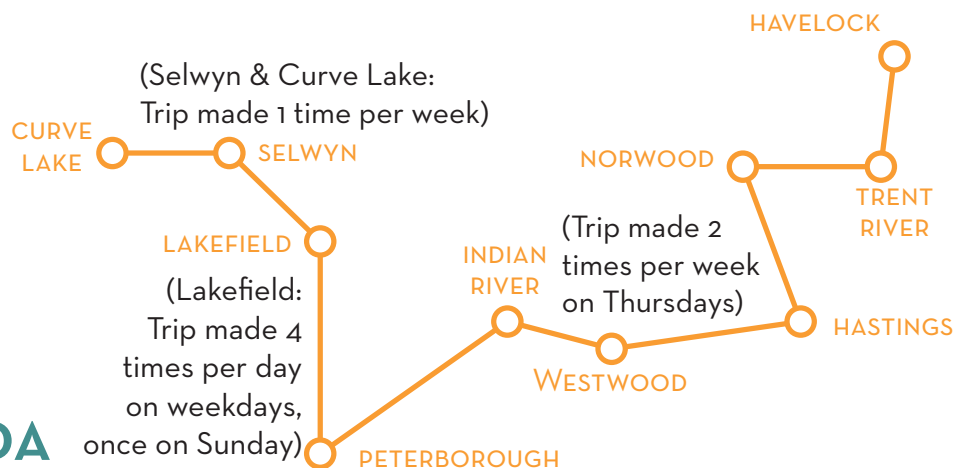
#### GO TRANSIT



#### GREYHOUND



#### COACH CANADA BUSES



#### COACH CANADA CHARTER



# CHAPTER FOUR

## LOCAL & PROVINCIAL POLICIES

Local and provincial policies influence the shape of our community and help to articulate priorities for infrastructure development, spending, and land use. The direction provided by these policies greatly impacts walkability and bikeability in Peterborough City and County. This chapter will explore some of the policy documents that most directly influence active transportation locally, and will outline future goals related to walking, cycling, and transit.

### CITY OF PETERBOROUGH

## COMPREHENSIVE TRANSPORTATION PLAN

The City of Peterborough 2012 Comprehensive Transportation (CT) Plan set out targets for the different modes of transportation.

TRAVEL MODE	ACTUAL (2006)	TARGET (2031)
Auto Driver / Passenger	87%	83%
Transit	4%	6%
Cycling & Walking	6%	8%
Other	3%	3%

The CT Plan includes statements that guide the vision to develop transportation demand management programs, an active transportation system, and transit objectives (City of Peterborough 2012a). The subsequent Transit Operations Review, completed in 2012, provided an extensive review of the transit route system, fare policies, infrastructure, and operational policies (City of Peterborough 2012b).

### CYCLING NETWORK

The CT Plan provides maps of a proposed cycling network and outlines a timeline for projects that should be completed in the short, medium and long term. An assessment of project feasibility was not conducted as part of the Plan, but will be addressed as part of a Cycling Master Plan, which the City is planning to complete over the next two years. The approved Cycling Network includes a total of 83 km of new on- and off-road cycling facilities, including more than 95 distinct cycling infrastructure projects (City of Peterborough 2012a). Funding for implementation of the network is provided in the capital budget.

Since 2012, cycling lanes have been completed on the Hunter Street bridge and on Lansdowne Street between Spillsbury Drive and Brealey Drive. Sixteen other projects are in the planning or design stages:

## MULTI-USE TRAIL (OFF ROAD) PROJECTS

1. Trans-Canada Trail - Ashburnham Drive to City limits
2. Rotary Trail - the rowing club to Eastbank Drive
3. Otonabee River Trail - Del Crary Park to Haggart Street

## PROJECTS ALONG A ROAD (ON-ROAD) PROJECTS

4. George Street - Sherbrooke Street to Perry Street
5. Bethune Street - Townsend Street to just north of Dublin Street
6. Trans-Canada Trail - Maria Street - Rogers Cove to Edgewater Boulevard
7. Brealey Drive - Lansdowne Street to the Fleming Parkway
8. Ashburnham Drive - Lansdowne Street to Maria Street
9. McDonnel Street - Park Street to Water Street
10. Charlotte Street - Park Street to Water Street
11. Upgrading of existing George Street cycling lanes - McDonnel Street to Hilliard Street
12. Upgrading of existing Water Street cycling lanes - McDonnel Street to Hilliard Street
13. Parkway Corridor - Clonsilla Avenue to Water Street
14. Parkhill Road - Wallis Drive to Brealey Drive
15. Sherbrooke Street - Glenforest Boulevard to Brealey Drive
16. Chemong Road - Parkway Trail to Wolsely Street



Photo Credit: Susan Sauvé

## ACTIVE TRANSPORTATION BY-LAW

Over the last two years, the City has been undertaking a review of its by-laws that pertain to cycling, skateboarding, and in-line skating. In August 2014, a new Active Transportation By-law was approved (City of Peterborough 2014).

The major changes embodied in the new By-law are intended to support active forms of transportation, and include:

1. Permitting children under 14 years of age to cycle on the sidewalk;
2. Permitting skateboarding and in-line skating on the sidewalk outside of the downtown and in cycling lanes on roads;
3. Prohibiting the use of scooter-style e-bikes on multi-use trails; and,
4. Developing an education program to promote the By-law and safe cycling.

## SIDEWALK POLICY & STRATEGIC PLAN

The City's Sidewalk Policy and Sidewalk Strategic Plan (SSP) (described in Chapter Two), combined with density targets in the provincial Growth Plan for the Greater Golden Horseshoe and the expansion of the trail network as approved in the CT Plan, provide a strong foundation for improving the walking environment in the City. The strength of the City's active transportation system has increased significantly in the last decade due to the Sidewalk Policy and the SSP. Both of these are living documents that are referred to and used frequently by staff and councillors to guide decisions about walking infrastructure (City of Peterborough 2012c & 2008).



Photo Credit: City of Peterborough





Photo Credit: Lydia Dotto



# COUNTY OF PETERBOROUGH

## TRANSPORTATION MASTER PLAN

The update to the County of Peterborough's Transportation Master Plan, approved in 2014, recommends the development of a County-wide Active Transportation Plan. A potential cycling network was provided as a map in the Transportation Plan Update and has been designed to integrate with existing municipal trail systems in both the County and the City (County of Peterborough 2014).

## TOWNSHIPS

## TRAILS MASTER PLANS

The Township of Selwyn (2014) and the Township of Cavan-Monaghan (2014) have both adopted Trails Master Plans in recent years. The goal of these plans, both of which provide specific steps for implementation, was to create recreational opportunities for walking and cycling, as well as to preserve the natural environment.

*The Selwyn recreational trails network will consist of hiking trails, on and off-road bicycle routes, and multi-use trails.*

*The guidelines and principles in the Recreational Trail Master Plan will ensure that the Township is able to provide pedestrian and bicycle friendly neighbourhood design well into the future.*

*~ Township of Selwyn*



Photo Credit: PCCHU

## COMPLETE STREETS POSITION

*The Peterborough County-City Board of Health recognizes and endorses a Complete Streets approach to provincial, regional and local transportation policy formation and implementation.*

*The reasons for endorsement of the position statement are several, including that, Complete Streets practices have been shown to have positive impacts on multiple public health interests (physical activity levels, injury prevention, mitigation of climate change, health hazards, and social cohesion/mental wellness).*

*- Peterborough County-City Health Unit*



Photo Credit: Susan Sauvé

The Peterborough County-City Health Unit has been working alongside several partners over the last 15 years to support active and safe recreational and transportation activities. In the fall of 2013, the Board of Health adopted a Complete Streets Position Statement and is now working to have complete streets policies adopted by the municipalities it serves. Municipalities that adopt complete streets policies plan their transportation network for the most vulnerable road user, which ultimately makes roads safer for everyone. The City of Peterborough's 2012 CT Plan recommends the development of a Complete Streets Policy for the City, and since completion of the Plan, the City has been integrating complete streets design principles into many of its capital projects.



At the provincial level, there are several policies that influence active transportation plans and infrastructure. These include the Provincial Policy Statement (PPS), the Growth Plan for the Greater Golden Horseshoe, and active transportation-specific policies such as the Ontario Trails Strategy and the recently approved Ontario cycling strategy, cycleON.

## PROVINCIAL POLICY STATEMENT

The PPS provides policy direction on matters of provincial interest related to land-use planning and development. It establishes the policy foundation for regulating the development and use of land with a vision to promote strong communities, a strong economy, and a clean and healthy environment. It includes policies on key issues that affect Ontario communities, such as:

- the efficient use and management of land and the provision of infrastructure;
- the protection and use of resources including natural heritage, water, agriculture and minerals;
- ensuring appropriate opportunities for employment and residential development, including support for a mix of uses; and,
- the protection of public health and safety.

In accordance with the Planning Act, all municipal decisions related to land-use planning must be consistent with the direction of the PPS. Accordingly, municipalities typically use the PPS to develop their Official Plans and to guide and inform decisions on planning matters. This policy is the foundation upon which the municipal Official Plans are based (Ontario Ministry of Municipal Affairs and Housing 2014).

***“We shape land use – then it shapes us”***  
***~2014 Provincial Policy Statement***

## GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE

The Growth Plan for the Greater Golden Horseshoe is a provincial plan that came into effect in 2006 to manage growth in the region to 2031, which includes Peterborough (Ontario Ministry of Municipal Affairs and Housing 2006). Municipalities were required to bring their Official Plans into conformity with its policy directions by June, 2009. The impact of the Growth Plan has the potential to be far-reaching, as the Planning Act requires all Council decisions to conform to it.

### THE GROWTH PLAN PROVIDES POLICY DIRECTIONS THAT AIM TO:

1. Revitalize downtowns to become vibrant and convenient centres;
2. Create complete communities that offer more options for living, working, shopping,



- and playing;
- 3. Provide greater choice in housing types to meet the needs of people at all stages in life;
- 4. Curb urban sprawl and protect farmlands and green-spaces for future generations; and,
- 5. Reduce traffic gridlock by improving access to a greater range of transportation choices.

In 2009, the City amended its Official Plan to conform to the Growth Plan. The City is currently reviewing its Official Plan as required by the Planning Act, and will be required to ensure that any new updates are consistent with both the 2014 PPS and the Growth Plan. All developments, including suburban developments, will be guided by the policies set out in these documents.

## CYCLEON

Ontario's Cycling Strategy, cycleON, outlines what needs to be done to promote cycling across the province as a viable mode of transportation over the next 20 years. This strategy represents the first major cycling policy initiative at the provincial level in 20 years and will act as a catalyst to improve opportunities for cycling across Ontario (Ontario Ministry of Transportation 2013).

## ONTARIO TRAILS STRATEGY

The Ontario Trails Strategy is a long-term plan that establishes strategic directions for planning, managing, promoting and using trails in Ontario. Implementation of the strategy has had minimal progress in the last few years (Ontario Ministry of Tourism, Culture & Sport 2010).



Photo Credit: Susan Sauvé

# CHAPTER FIVE

## PROGRAMMING, EDUCATION & ADVOCACY

Infrastructure and policy development have a significant influence on levels of walking and cycling. However, programming, education, and advocacy initiatives to support active transportation can also help to shift perceptions related to travel, provide individuals with the skills necessary to travel safely, and help to foster a culture of walking and cycling locally.

Over the past twenty years, local municipalities, public health and regional non-profit organizations have been developing and implementing programs designed to support and encourage the use of walking, cycling, transit, carpooling and telecommuting in the City and County of Peterborough. Many of these programs have become nationally recognized and have helped to shape transportation demand management strategies being used in other communities. This chapter will provide an overview of the workplace-, school-, and community-based programs that have been, or are being, implemented regionally.

### WORKPLACE-BASED PROGRAMS

The Shifting Gears Workplace Transportation Challenge is one of the longest standing commuter challenges in Canada. The Challenge is a month-long competition created to inspire Peterborough-area employees to use active modes of commuting, such as walking and biking, as well as public transit and ride sharing. Participants register online to take part in the Challenge, and then log their trips daily to win prizes and to help their workplace become a Travel Wise Workplace award winner.

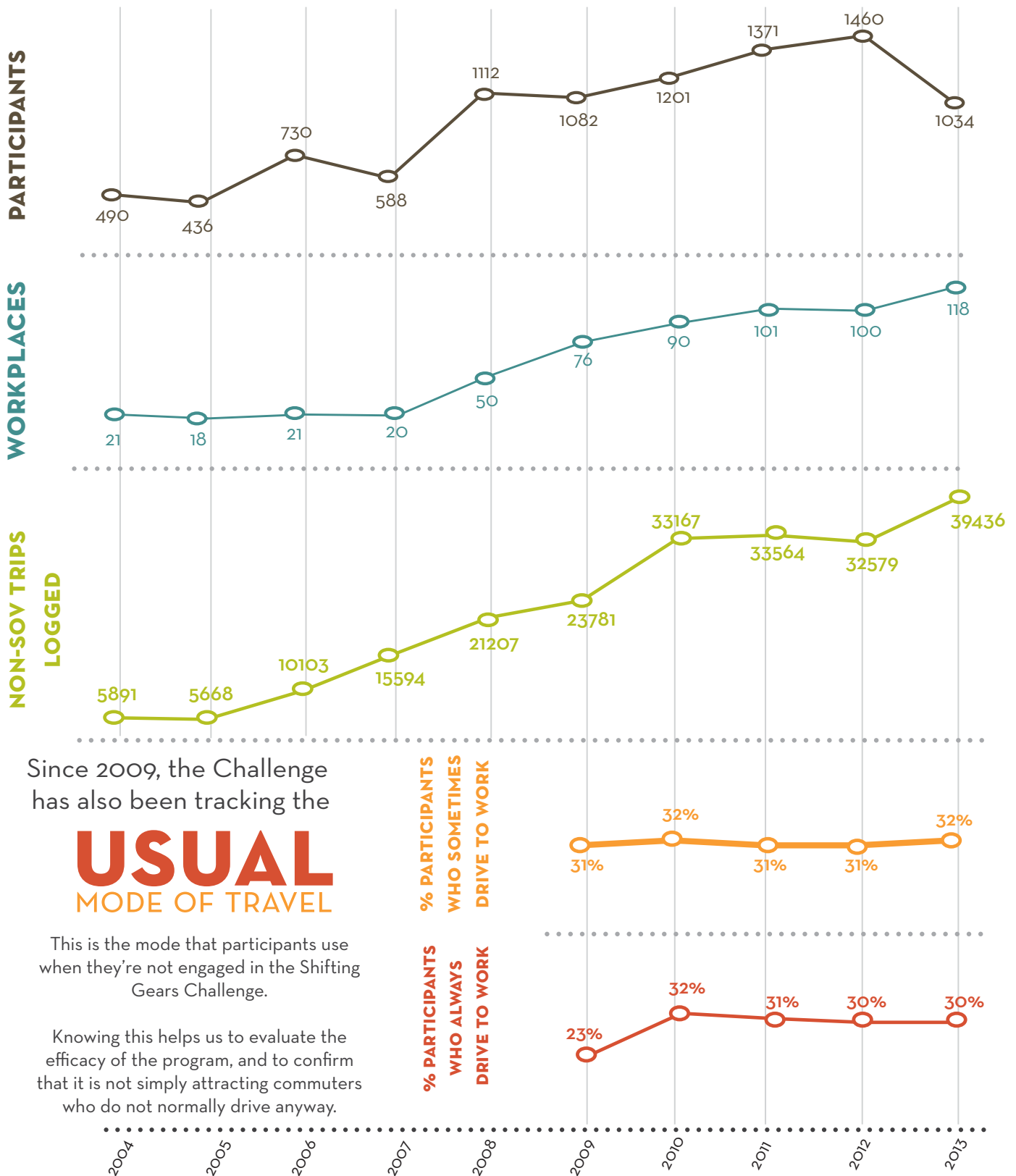
***The 2013 Challenge, which was the 10th annual, saw more than a 25% decrease in the number of drive-alone trips being made during the month of May.***

In general, the program has seen an increase in the number of participating workplaces and employees, and has also seen an increase in the number of car-free trips being logged.

Participants are asked, upon registration, to indicate how they normally choose to travel to work. This helps to elucidate the extent to which the program is actually changing behaviour, as opposed to simply engaging commuters who are already walking, cycling or riding transit. The percentage of participants who identify as always driving to work outside the program period account for nearly one third of participants, while the percentage of participants who identify as sometimes driving to work account for an additional third. This means that only one third of participants are already regularly traveling car-free.

# COMMUTER CHALLENGE ENGAGEMENT

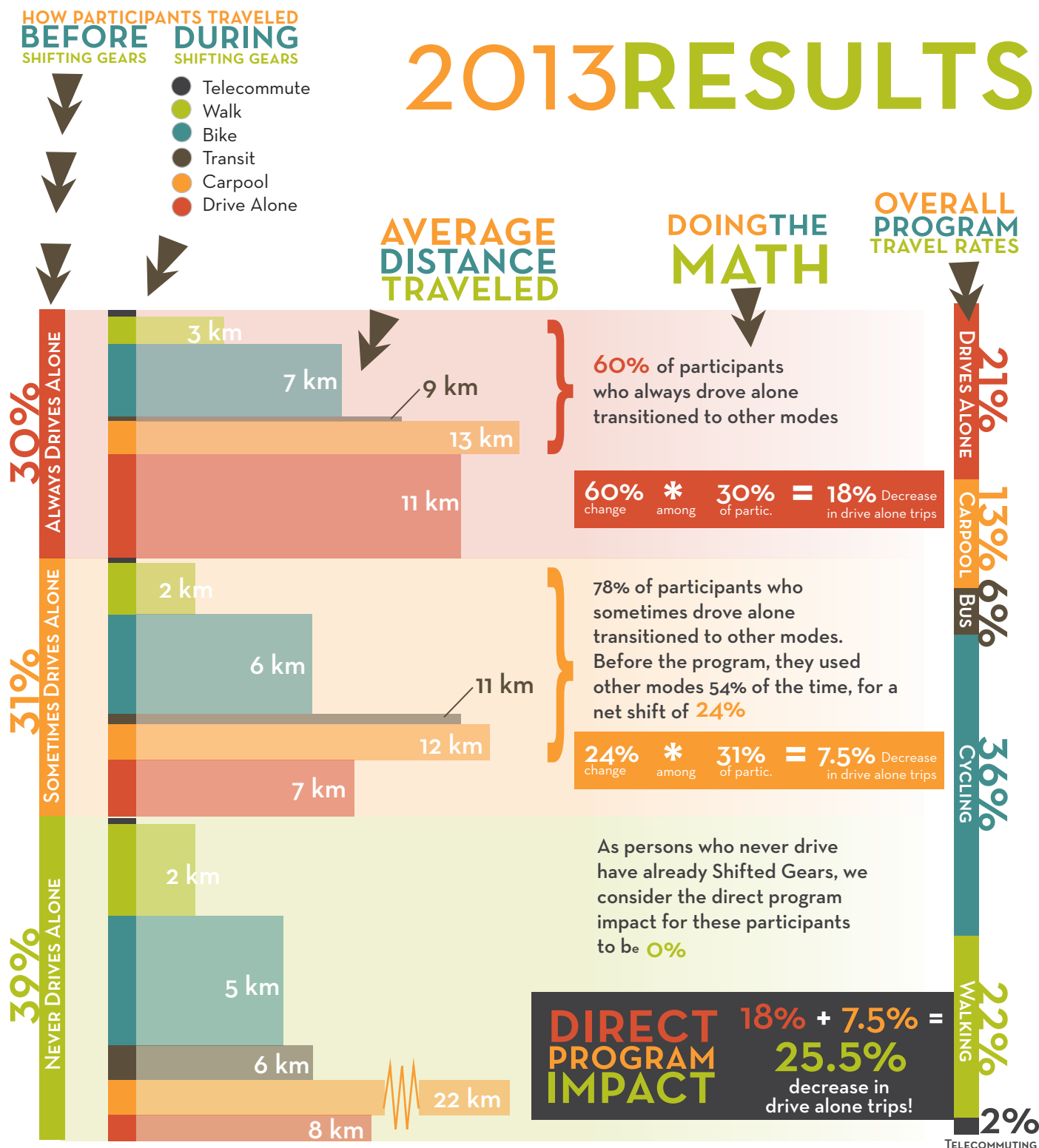
Since 2004, the Peterborough Workplace Shifting Gears Challenge has encouraged commuters to use sustainable modes of transportation during the month of May



Source: GreenUP, 2013, Personal Correspondence

# COMMUTER CHALLENGE IMPACT

## 2013 RESULTS



Source: GreenUP, 2013, Personal Correspondence





Photo Credit: Clifford McCarten





Photo Credit: Brianna Salmon

## SCHOOL-BASED PROGRAMS

Since 1999, the Active and Safe Routes to School (ASRTS) Committee has been leading the implementation of programs and campaigns to encourage active and efficient travel to and from school. The Committee includes representatives from the City of Peterborough, the Peterborough County-City Health Unit, GreenUP, the Kawartha Pine Ridge District School Board, Student Travel Services of Central Ontario, and the Peterborough Lakefield Community Police Service.

### ASRTS PROGRAMMING

*Since 1999, Active and Safe Routes to School Peterborough has been offering transportation-focused programming at local schools*

2004 - 2013



On the Bus is a program that takes grade 3 students on a guided tour of the City aboard a Peterborough Transit bus. To date:

**5,766** STUDENTS HAVE PARTICIPATED

2008 - 2013



Grade 8 Transit Quest provides grade 8 students across the City with free transit passes for 2 weeks over March Break. To date:

**5,680** PASSES HAVE BEEN DISTRIBUTED  
**12,451** RIDES HAVE BEEN TAKEN

2008 - 2013



The Car-Free School Days Campaign encourages students to walk, bike, or ride the bus on the first Wednesday of each month. An average of:

**2,250** STUDENTS PARTICIPATE EACH YEAR

2008 - 2013



School Travel Maps are developed for individual schools in Peterborough to support safe and informed school travel planning. To date, unique maps have been developed for:

**6** LOCAL SCHOOL COMMUNITIES

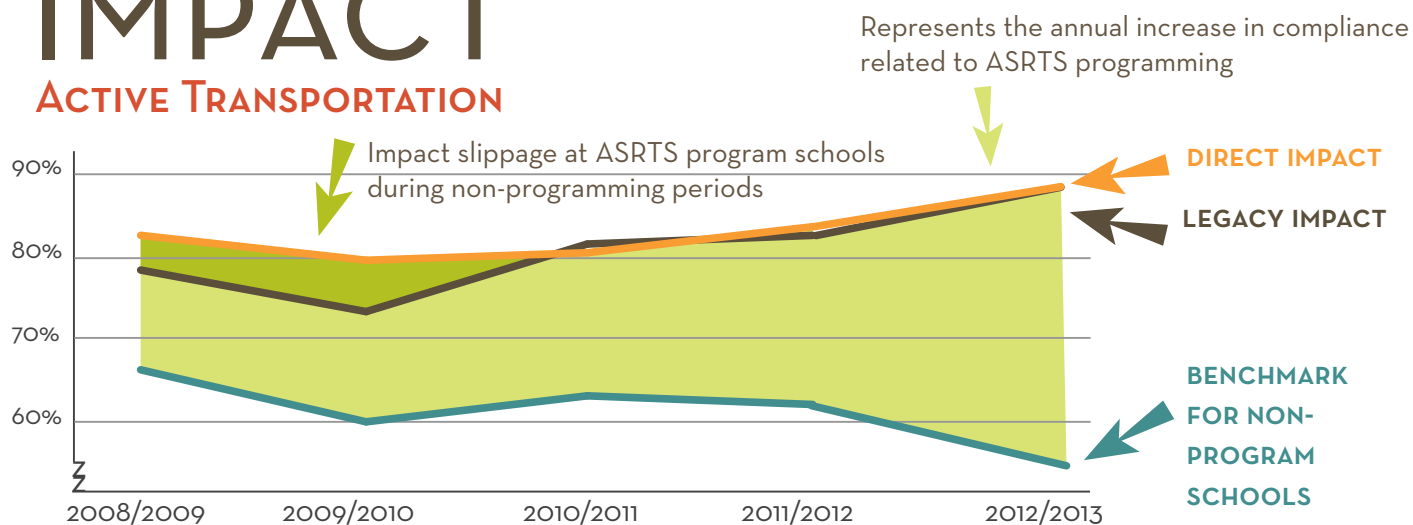
Source: Active & Safe Routes to School Peterborough, 1999 - 2013, Personal Correspondence

In addition to programming, ASRTS also undertakes annual Student Travel Surveys at a rotating sample of schools. This allows the Committee to track travel changes over time and to evaluate the impact their programming is having at schools that regularly participate relative to those schools that do not.

***Since 2000, rates of walking and school bus ridership have decreased at schools across the City. However, at schools that regularly participate in ASRTS programming the opposite trend is observed – rates of walking and school bus ridership have increased.***

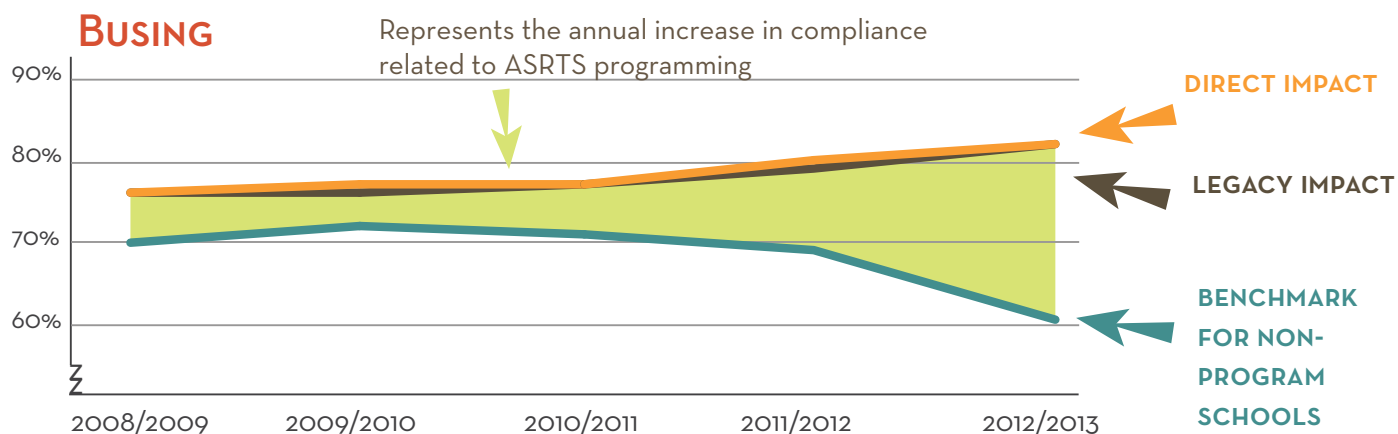
The Student Travel Surveys also allow the ASRTS Committee to evaluate the impact their programming is having relative to a city-wide benchmark comprised of non-program schools. The Car-Free School Days program, one of the Committee's largest campaigns, encourages students to use their designated mode of transportation (either active transportation or busing) on the first Wednesday of each month. The modes being used by students at Car-Free School Days schools are tracked by the school administrators and logged by ASRTS. By comparing this data to the benchmark, the Committee is able to evaluate the direct impact this campaign is having on program days. Further, by surveying student travel behaviour at Car-Free School Days schools on non-program days, the Committee is able to assess the legacy impact of the campaign – or the extent to which students are walking or riding the bus even when not being directly encouraged to do so through the program. While, during the first few years of the campaign, there was a decrease observed between rates of walking and busing on program versus non-program days at Car Free School Days schools, over time it appears that the elevated use of these modes has become integrated into students' regular routines – a significant programming success. Rates of travel in the following graphics represent rates of compliance (ie. number of designated walkers who are actually walking on the trip to school).

## CAR-FREE SCHOOL CHALLENGE IMPACT ACTIVE TRANSPORTATION



Source: Active & Safe Routes to School Peterborough, 2008 - 2013, Personal Correspondence





The Student Travel Survey results also help to identify gaps in programming. While rates of walking and busing have been increasing as a result of ASRTS interventions, rates of cycling at local elementary schools have remained very low. To address this, B!KE: the Peterborough Community Cycling Hub and GreenUP developed a suite of school-based cycling programs in 2013. These workshops, modeled upon the successful in-school cycling programs being implemented across the United States and United Kingdom, engaged more than 500 students per year in single-day or multiple-session educational workshops designed to help them gain the experience and skills necessary to ride their bicycles safely on the streets. These programs, while only in their second year, have been well received and are helping to set a precedent for integrated cycling education in Ontario schools.



Photo Credit: Brianna Salmon

# IN-SCHOOL CYCLING EDUCATION

*In 2013, GreenUP and B!KE: the Peterborough Community Bike Shop began offering in-school cycling education programs to students in grades 3 through 9.*

**315 STUDENTS  
PARTICIPATED IN**

One day bicycle rodeos, offered in partnership with the Peterborough Community Police Service



**211 STUDENTS  
PARTICIPATED IN**

Intensive multi-session bicycle skill development and repair courses



*The intensive sessions included:*

**8 RIDING-  
FOCUSED  
COURSES**

which occurred during the spring and included an average of:

**4 HOURS OF  
INSTRUCTION  
PER COURSE**

*and,*

**2 REPAIR-  
FOCUSED  
COURSES**

which occurred over the winter and included an average of:

**15 HOURS OF  
INSTRUCTION  
PER COURSE**

GreenUP & B!KE: the Peterborough Community Bike Shop, 2013, Personal Correspondence





Photo Credit: Brianna Salmon

# COMMUNITY-BASED PROGRAMS

## EDUCATION

In addition to the school-based cycling education programs, the City of Peterborough, GreenUP, and B!KE: the Peterborough Community Bike Shop have also led the development of a number of cycling education programs in the City and County of Peterborough. While some of these programs are broad-based, many of these programs seek to ensure that cycling remains an inclusive activity through targeted interventions. To further this mandate, B!KE and GreenUP have recently developed programs that focus on meeting the needs of specific demographics, such as youth-at-risk and children with physical and/or cognitive exceptionalities. Additionally, B!KE's core programming seeks to increase access to bicycles, helping to ensure that the costs associated with bicycle ownership and maintenance do not prevent participation.

### COMMUNITY CYCLING EDUCATION PROGRAMMING

2009 - 2013



**236** COMMUNITY MEMBERS  
HAVE PARTICIPATED

**89**

Took part in intensive 9-hour  
League of American Bicyclist  
Smart Cycle courses

**147**

Took part in 2- to 3-hour workshops  
focused on building skills and confi-  
dence in an urban environment



### BICYCLE MAINTENANCE WORKSHOPS

Maintenance workshops range from 2 hour courses  
focusing on the ABC's of bicycle maintenance to the  
more thorough Home Mechanic's Workshop Series.

**351** COMMUNITY  
MEMBERS HAVE  
PARTICIPATED

Source: GreenUP, City of Peterborough  
& B!KE, 2007 - 2013, Personal Correspondence





2007 - 2013

# 4 COMMUNITY BICYCLE RODEOS

In partnership with Wild Rock Outfitters, the Peterborough Lakefield Community Police Service, the Peterborough Cycling Club, and the Peterborough County-City Health Unit community bicycle rodeos were offered.

**105** CHILDREN PARTICIPATED



2009 & 2011

# WINTER CYCLING WORKSHOPS

Safe winter cycling workshops were offered for persons interested in year-round commuting.

**11** COMMUNITY MEMBERS HAVE PARTICIPATED



2011 - 2013

# COMMUTER CYCLING WORKSHOPS

As part of the Shifting Gears Program, cycling workshops are offered to workplaces across the City. These courses focus on skill development, the rights and responsibilities of cyclists, and route planning

**175** COMMUTERS HAVE PARTICIPATED

2012 - 2013

# YOUTH-AT-RISK CYCLING EDUCATION

In partnership with the Peterborough Poverty Reduction Network, Prince of Wales Public School, the Peterborough Regional Health Centre, Katimavik, the Bridge Youth Centre, the Loft, and the John Howard Society, a variety of cycling programs were offered to engage youth-at-risk in our community.

**92** YOUTH PARTICIPATED

2012 - 2013

# ADAPTED CYCLING PROGRAMS

In partnership with Five Counties Children's Centre, Community Living Peterborough, the Down Syndrome Association of Peterborough, Kerry's Place Autism Consulting, Bridges Canada, and iCan Shine, a variety of programs were offered to support children with intellectual or physical exceptionalities.

**43** CHILDREN PARTICIPATED

# BICYCLE ACCESS PROGRAMMING

## ACCESS

Since 2006, B!KE: the Peterborough Community Bike Shop has been offering a variety of programs to increase access to bicycles.

Since its founding,

B!KE'S MEMBERSHIP  
HAS INCREASED BY  
AN AVERAGE OF  
**144%**  
PER YEAR

FROM 27 MEMBERS IN 2006

to

**300**  
in 2013

In 2013, B!KE was able to support this many members thanks to the significant contribution made by its volunteers.

B!KE HAD  
**57**

VOLUNTEERS IN 2013  
(UP FROM 5 IN 2009)

IN 2013, THOSE  
MEMBERS MADE  
**1,700**  
UNIQUE VISITS  
TO THE SHOP

IN 2013, THESE  
VOLUNTEERS CONTRIBUTED  
**1,058**  
HOURS AT THE SHOP

Source: B!KE, 2006 - 2013, Personal Correspondence



Photo Credit: Brianna Salmon

In addition to educational and skill-development focused programming, there are also a number of advocacy interventions that seek to bring together stakeholders and individuals from across the region to support and build capacity around issues related, primarily, to cycling. Many of these events are coordinated by the Peterborough Bicycle Advisory Committee (PBAC), a group of cycling enthusiasts and organizational representatives dedicated to fostering a culture of cycling in the City and County of Peterborough. Founded in 2009, PBAC hosts an annual cycling summit in the Peterborough region. They also distribute a newsletter to highlight cycling-centric policies, projects and programs being undertaken in the region.

Source: Peterborough Bicycle Advisory Committee, 2011 - 2013, Personal Correspondence

## ADVOCACY

### IN 2011, PBAC COORDINATED THE INAUGURAL **PETERBOROUGH & THE KAWARTHAS CYCLING SUMMIT**

2013 was the 3rd Annual Summit, and attracted:

# 200 LOCAL CYCLISTS



# CHAPTER SIX

## ACTIVE TRANSPORTATION & HEALTH

Active transportation provides an equitable means of travel while at the same time providing individuals with the physical activity their bodies require. Active transportation and physical activity play an important role in the health, well-being, and quality of life of Canadians. Research shows that when adults and children incorporate physical activity into their lives they live longer, healthier lives, tend to be more productive, and are more likely to avoid illness and injury. This chapter will explore physical activity and active transportation as they relate to chronic diseases and their risk factors in Peterborough City and County.

### PHYSICAL ACTIVITY

In Canada, the Canadian Society for Exercise Physiology is responsible for issuing the Canadian Physical Activity Guidelines (Canadian Society for Exercise Physiology 2014). These Guidelines provide Canadians with recommended minutes of physical activity, based on their age, as well as suggested activities that might help them to achieve these recommendations. Many of these suggested activities, including brisk walking and cycling, can be integrated into the daily commute or trip to school.

Researchers have found that as a person ages, their amount of physical activity decreases when compared to the daily physical activity of a preschooler (Active Healthy Kids Canada 2014, Colley et al. 2011). These findings suggest that there is a large percentage of the Canadian population that needs to increase both the duration and frequency of their moderate to vigorous physical activity.

This is particularly true for youth aged 12 to 17, only 4% of whom meet the recommended physical activity guidelines.



Photo Credit: Brianna Salmon



# RECOMMENDED PHYSICAL ACTIVITY

*The Canadian Physical Activity Guidelines suggest the required amount of daily or weekly physical activity for specific age groups:*

Recommended minutes of physical activity per week:

## **PRESCHOOLERS (3 - 4 YEARS)**



**180 MINUTES / DAY**

of physical activity at any intensity

% of Canadians within each age grouping who are meeting the Guideline recommendations:

**84%\***

of 3 - 4 year olds are active enough to meet the guidelines

## **CHILDREN (5 - 11 YEARS)**



**60 MINUTES / DAY**

of moderate- to vigorous-intensity activity

**7%\***

of 5 - 11 year olds are active enough to meet the guidelines

## **YOUTH (12 - 17 YEARS)**



**60 MINUTES / DAY**

of moderate- to vigorous-intensity activity

**4%\***

of 12 - 17 year olds are active enough to meet the guidelines

## **ADULTS (18+ YEARS)**



**150 MINUTES / WEEK**

of moderate- to vigorous-intensity activity

**15.4%\*\***

of adults are active enough to meet the guidelines

Source: Canadian Society for Exercise Physiology, 2014

Source: \* Active Healthy Kids Canada, 2014

\*\* Colley, C. et al., 2011

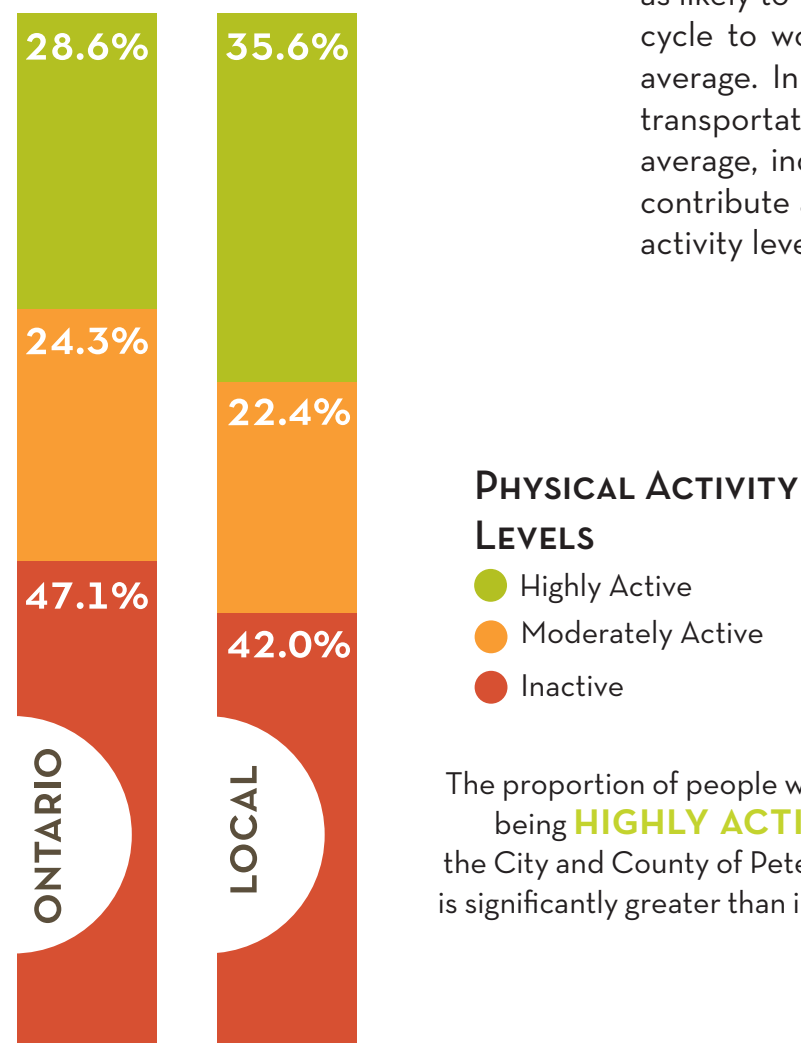
# LEVELS OF PHYSICAL ACTIVITY

## PHYSICAL ACTIVITY IN PETERBOROUGH

Locally, there is no measured data available to determine whether Peterborough City and County residents are getting enough moderate to vigorous physical activity to meet the Canadian Physical Activity Guidelines. However, the Canadian Community Health Survey (CCHS) does assess **self-reported** physical activity to determine if an individual is highly active, moderately active, or inactive.

## LEVELS OF PHYSICAL ACTIVITY

*Provincial & Local Trends*



When CCHS data are reviewed over time, Peterborough consistently has a higher proportion of highly active residents compared to Ontario. Additionally, Peterborough City and County residents also engage in more walking compared to the provincial average. As observed in Chapter One, Peterborough City residents are nearly twice as likely to walk and almost three times as likely to cycle to work, when compared to the provincial average. In the County, however, rates of active transportation are lower than the provincial average, indicating that walking to work may not contribute as much to the recommended physical activity levels for rural commuters.

The proportion of people who report being **HIGHLY ACTIVE** in the City and County of Peterborough is significantly greater than in Ontario.

Source: Canadian Community Health Survey, 2011/2012

# PHYSICAL ACTIVITY PREFERENCES

Peterborough City & County



of Peterborough residents 12 and older have **WALKED** for exercise in the last 3 months



of Peterborough residents 12 and older have **CYCLED** for exercise in the last 3 months



of Peterborough residents 12 and older have **JOGGED** for exercise in the last 3 months

74.5%

68.0%

PTBO

ONTARIO

A greater proportion of Peterborough residents engage in walking for exercise compared to the province.

Source: Canadian Community Health Survey, 2011/2012



Photo Credit: Susan Sauvé

## PHYSICAL ACTIVITY & HEALTH



Photo Credit: Susan Sauvé

Despite the high proportion of City and County residents that are highly active, there are still 42% of residents considered inactive. This means that there are a substantial number of City and County residents who are not benefiting from the numerous positive health outcomes that result when a person is physically active.

According to Mowat et al. “the health benefits of physical activity are immense. Each hour of moderate or vigorous activity per week is associated with a 4% to 9% reduction in the risk of death from all causes.” (2014, 9). This translates to 10% to 22.5% lower risk of death from all causes for adults who follow the Canadian Physical Activity Guidelines and achieve the required 150 minutes each week (Mowat et al. 2014).

Overall, each hour of moderate-to vigorous-intensity activity per week is associated with a

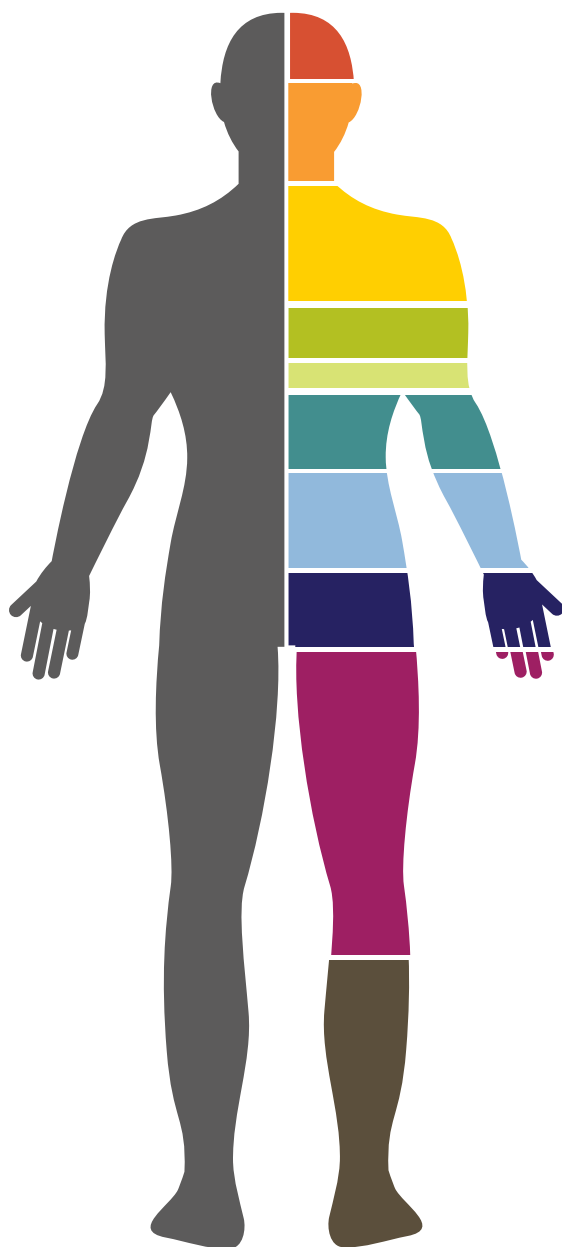
**4% - 9%**  
↓ reduction in the risk of death from all causes

Sources for opposing page: (1) Ontario Brain Institute 2013, (2) Paluska & Schwenk 2000 (3) McAuley et. al. 2000, (4) Fox 1999, (5) Taylor 2000, (6) Hou et.al. 2004, (7) Hamer & Chida 2008, (8) Cavill et.al. 2007, (9) Knowler WC et. al. 2002, (10) Murphy et.al. 2007, (11) Wolin et al. 2009, (12) Berard A, Bravo G, Gauthier P. 2001, (13) Warburton DE, Gledhill N, Quinney A. 2001.

\*Sources 2-8, 10 & 11 all cited from Toronto Public Health, 2012 *Road to Health*



# HEALTH BENEFITS OF PHYSICAL ACTIVITY



Older adults who are physically active are almost 40% less likely to develop **ALZHEIMER'S DISEASE** than those who are physically inactive.<sup>1</sup>



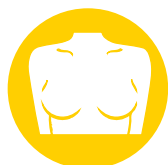
Engaging in physical activity can impact **MENTAL HEALTH**:

Decreases in:

- Depression
- Anxiety
- Stress
- Panic Disorders<sup>2</sup>

Increases in:

- Self-Esteem<sup>3</sup>
- Mood<sup>4</sup>
- Happiness
- Satisfaction<sup>5</sup>



Active commuting has been associated with significant reductions in the risk of **BREAST CANCER**.<sup>6</sup>



Active commuting has been shown to reduce the incidence of **HEART DISEASE AND STROKE**.<sup>7,8</sup>



Physical activity reduces **HIGH BLOOD PRESSURE**.<sup>7</sup>



Regular physical activity, along with healthy eating and weight control, can reduce **TYPE 2 DIABETES** incidence by 60%.<sup>9</sup>



People who use active transportation are at lower risk of being **OBESE**.<sup>10</sup>



Physical activity has been associated with a 24% reduction in risk of **COLON CANCER**.<sup>11</sup>



Physical activity increases **MUSCULAR STRENGTH, ENDURANCE AND FLEXIBILITY**.<sup>13</sup>



Physical activity has been shown to help build bone mass and decrease risk of **OSTEOPOROSIS**.<sup>12</sup>

The direct relationship between physical activity and health holds true for the 2014 *Benchmarking Report: Bicycling and Walking in the United States*. A greater percentage of the population in US states that report high levels of active commuting meet or exceed recommended levels of physical activity and enjoy lower rates of obesity, high blood pressure, and type 2 diabetes (Alliance for Biking and Walking [ABW] 2014). In Ontario, a review of CCHS data reveals the same trend. Individuals in Ontario who are highly or moderately active are less likely to have heart disease, type 2 diabetes, and high blood pressure, and are less likely to be obese when compared to individuals who are inactive.

## CHRONIC DISEASES & **RISK FACTORS** BASED ON PHYSICAL ACTIVITY LEVELS

*Inactive*

*Moderately/  
Highly Active*

heart disease

6.5%



4.0%

high blood pressure

23.3%



14.7%

type 2 diabetes

9.1%

**TYPE  
2**

5.1%

obesity

21.6%

**BMI  
>30**

14.4%

Source: Canadian Community Health Survey, 2011/2012





## ACTIVE TRANSPORTATION & THE ENVIRONMENT

In addition to the individual health benefits of active transportation, walking and cycling also boast many environmental benefits, especially reductions in the greenhouse gas emissions that contribute to climate change. In Canada, over the past two decades, greenhouse gas emissions from the transportation sector increased by nearly a third, accounting for 27% of Canada's total emissions (Statistics Canada 2010). When analyzing emissions for various modes of travel, it is not surprising that walking and cycling have zero emissions, and that train and bus travel have lower emissions when calculated per passenger compared to automobiles (Copenhagen Bicycle Account 2010, cited in Planning Alliance 2014).

### ENVIRONMENTAL BENEFITS OF ACTIVE TRANSPORTATION



Source: Copenhagen Bicycle Account, 2010; cited in Planning Alliance 2014



In the coming years, climate change is expected to adversely affect the health of all Canadians. Many communities, including the Peterborough region, are already experiencing the negative effects associated with climate change, including an increase in the occurrence of severe weather events (Ministry of Environment 2008).

From an air-quality perspective, walking and cycling are considered non-polluting modes of travel (Sener et al. 2009, Winters et al. 2007, Heinen et al. 2010, Rietveld and Daniel 2004, Bergstrom and Magnusson 2003). This means that any effort to increase rates of walking and cycling as a mode of travel will help to reduce the vehicular emissions that contribute to poor air

quality (Winters et al. 2007, Rietveld and Daniel 2004). This pollution has very real health consequences - the Ontario Medical Association estimated that in 2008, approximately 9,500 premature deaths in Ontario, including 119 in Peterborough City and County were attributable to poor air quality (Ontario Medical Association 2008). Providing supportive programs and infrastructure that encourages the use of active modes can help to maintain the health of residents and of the natural environment.



# CHAPTER SEVEN

## ACTIVE TRANSPORTATION & SAFETY

Regular physical activity, such as walking and cycling, can have a substantial impact on improving public health and life expectancy (AWB 2014). In fact, the quantified health benefits of active transportation can outweigh any risks associated with these activities by as much as 77 to 1, and add more years to an individual's life than what is lost from air pollution and traffic injuries (AWB 2014). However, to gain a more complete picture of the benefits of active transportation, it is also important to understand the health risks that may be associated with this form of travel. This chapter explores the risks associated with cycling and walking in Peterborough City and County as well as ways to mitigate these risks.

### RISKS ASSOCIATED WITH WALKING & CYCLING

The World Health Organization has predicted that by 2020, road traffic injuries will become the third largest contributor to the global burden of disease (2004). According to Transport Canada, when compared to 12 other countries in 2008, Canada was ranked the 4th worst for fatalities per billion vehicle kilometers traveled (Transport Canada 2011a). In addition to this, research has shown that pedestrians and cyclists in Canada are faced with higher risks of injury and fatality per distance traveled than people who use a car, bus or train (Reynolds et al. 2010).

In Ontario, vehicle collisions over the past 20 years are on a downward trend; however, the number of pedestrian and cyclist injuries or fatalities is still considered unacceptable. As a result, in 2012 the Office of the Chief Coroner for Ontario released a pedestrian as well as a cyclist death review to highlight the number of pedestrian and cycling related fatalities in Ontario and the circumstances of these fatalities. The reviews found that in a one year period (2010) there were 95 pedestrian deaths and over a five year period (2006-2010) there were 129 cyclist deaths.

#### A SPECIFIC REVIEW OF THE PEDESTRIAN DEATHS SHOWS

(Office of the Chief Coroner for Ontario 2012):

- 55% were male and 45% were female.
- 36% were individuals over the age of 65 years.
- 75% occurred in urban areas and 24% in rural.
- 67% of the deaths occurred on roads posted above 50 km/hr and only 5% on roads below 50 km/hr. For the remainder, the posted speed was unknown.
- Peak hours for pedestrian collisions were between 2 pm and 10 pm daily, largely coinciding with peaks in traffic volume.

## A SPECIFIC ASSESSMENT OF THE CYCLING DEATHS SHOWS

(Office of the Chief Coroner for Ontario 2012):

- 86% were male;
- 15% occurred in those aged 19 years and under;
- 78% were struck by a motor vehicle;
- 65% took place in an urban environment, with the remaining 35% in a rural setting;
- 53% occurred in daylight conditions; and,
- When the cycling activity was known, 63% occurred during recreational activities, 31% during commuting and the balance during sport cycling activities.



Photo Credit: PCCHU



## INJURIES & FATALITIES

The number of pedestrian and cyclist injuries and fatalities in Peterborough can be analyzed by looking at emergency department (ED) data, hospitalization records, vital statistics information, and data from the Ministry of Transportation (MTO).

### PEDESTRIANS

#### *Peterborough City & County*

Between 2003 and 2012 in Peterborough, there were significantly more ED visits for pedestrian injuries compared to hospitalizations. ED visits tend to be less severe and do not require the patient to be admitted for an overnight stay. Hospitalizations, on the other hand, tend to be more severe as the injury required at least one overnight stay. The number of ED visits in Peterborough is decreasing over time while the number in Ontario has increased slightly.

To better understand the pedestrian injuries in Peterborough City and County, the ED and hospitalization statistics can be further analyzed by age grouping.

In the City and County of Peterborough, a greater proportion of ED visits are individuals under the age of 40. However, the more severe injuries that require a hospitalization are more common among individuals 60 years of age and older. This trend is the same across the province.



**836 EMERGENCY DEPARTMENT VISITS**  
(2003 - 2012)

**99 HOSPITALIZATIONS**  
(2003 - 2012)

**8 DEATHS**  
(2003 - 2009)

Sources: National Ambulatory Care Reporting System, Canadian Institute for Health Information (2003 - 2012)  
Discharge Abstract Database (DAD), Canadian Institute for Health Information (CIHI) (2003 - 2012)  
Statistics Canada, Ontario Registrar General (2003 - 2009)



# EMERGENCY DEPARTMENT & HOSPITALIZATION DEMOGRAPHICS

Peterborough City & County

## *Pedestrian Injuries*



If Peterborough residents were represented by 10 people, they would be the following ages:



If the **PEDESTRIAN EMERGENCY DEPARTMENT VISITS** made by Peterborough residents were represented by 10 people, they would be the following ages:



If the **PEDESTRIAN HOSPITALIZATIONS** for Peterborough residents were represented by 10 people, they would be the following ages:



### Sources: Emergency Department Statistics

Original source: National Ambulatory Care Reporting System (NACRS), Canadian Institute for Health Information (CIHI)

Distributed by: Ontario Ministry of Health and Long-Term Care (MOHLTC): IntelliHEALTH ONTARIO (IntelliHEALTH)

### Hospitalization Statistics

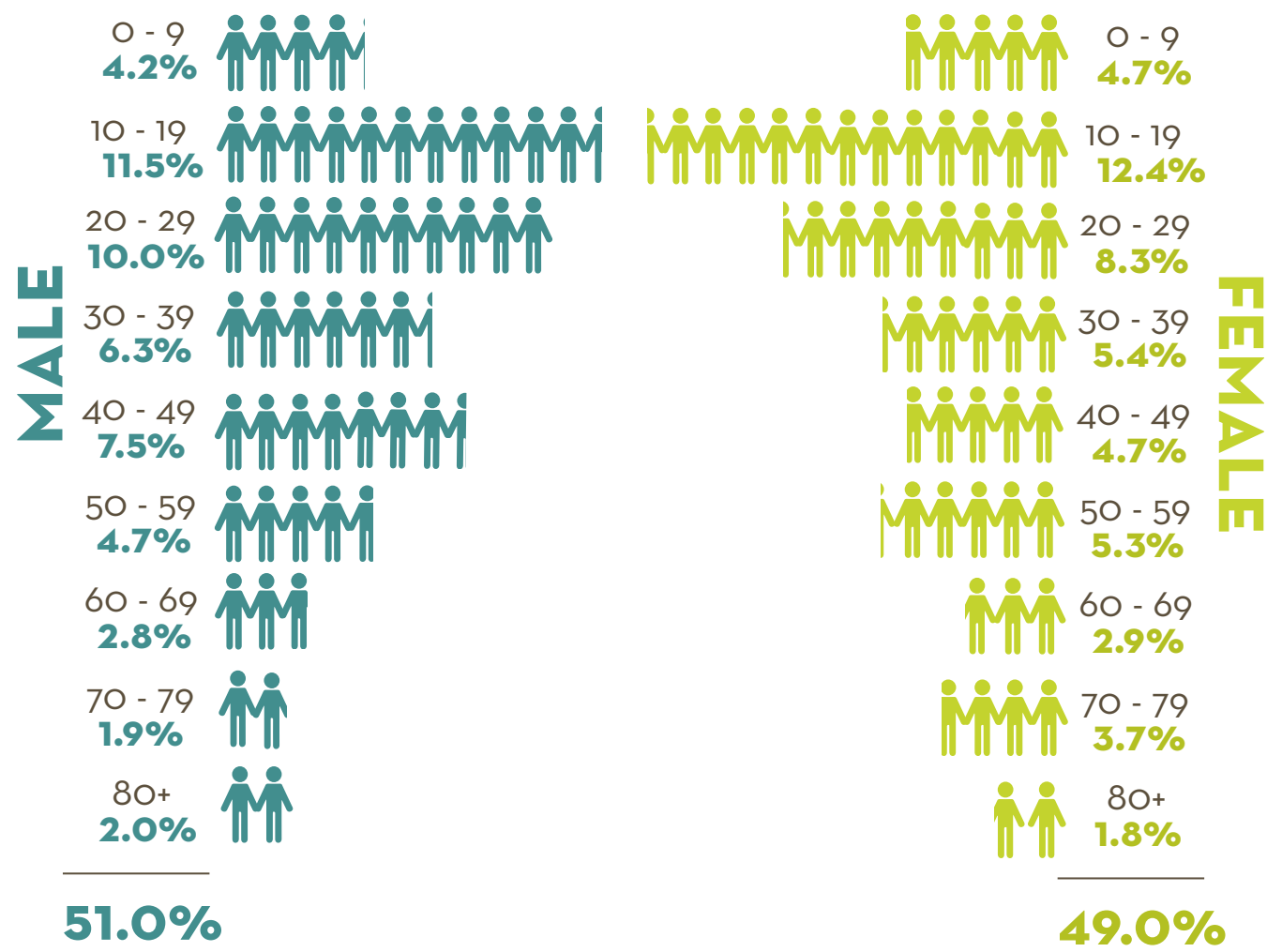
Original source: Discharge Abstract Database (DAD), Canadian Institute for Health Information (CIHI)

Distributed by: Ontario Ministry of Health and Long-Term Care (MOHLTC): IntelliHEALTH ONTARIO (IntelliHEALTH)

To understand why these age groups are more pronounced than others, ED data can be further broken down to show pedestrian injuries across age and gender.

This break down shows that the ED visits between 2003 and 2012 were evenly distributed between males and females, which is a trend also observed provincially. However, the proportion of Peterborough residents' 0-19 years of age who visited the ED due to a pedestrian injury is significantly higher than the provincial average.

# EMERGENCY DEPARTMENT VISITS FOR PETERBOROUGH RESIDENTS 2003 - 2012 | PEDESTRIANS

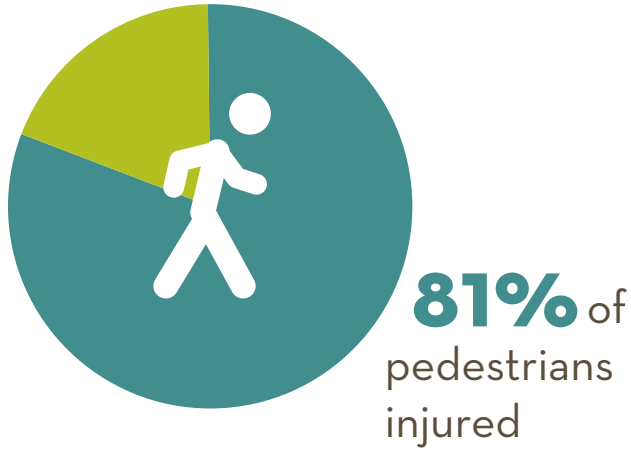


Source: National Ambulatory Care Reporting System, Canadian Institute for Health Information (2003 - 2012)



Photo Credit: Lindsay Stroud

# VEHICLE (CAR, PICK-UP TRUCK, VAN) COLLISION OCCURRENCE

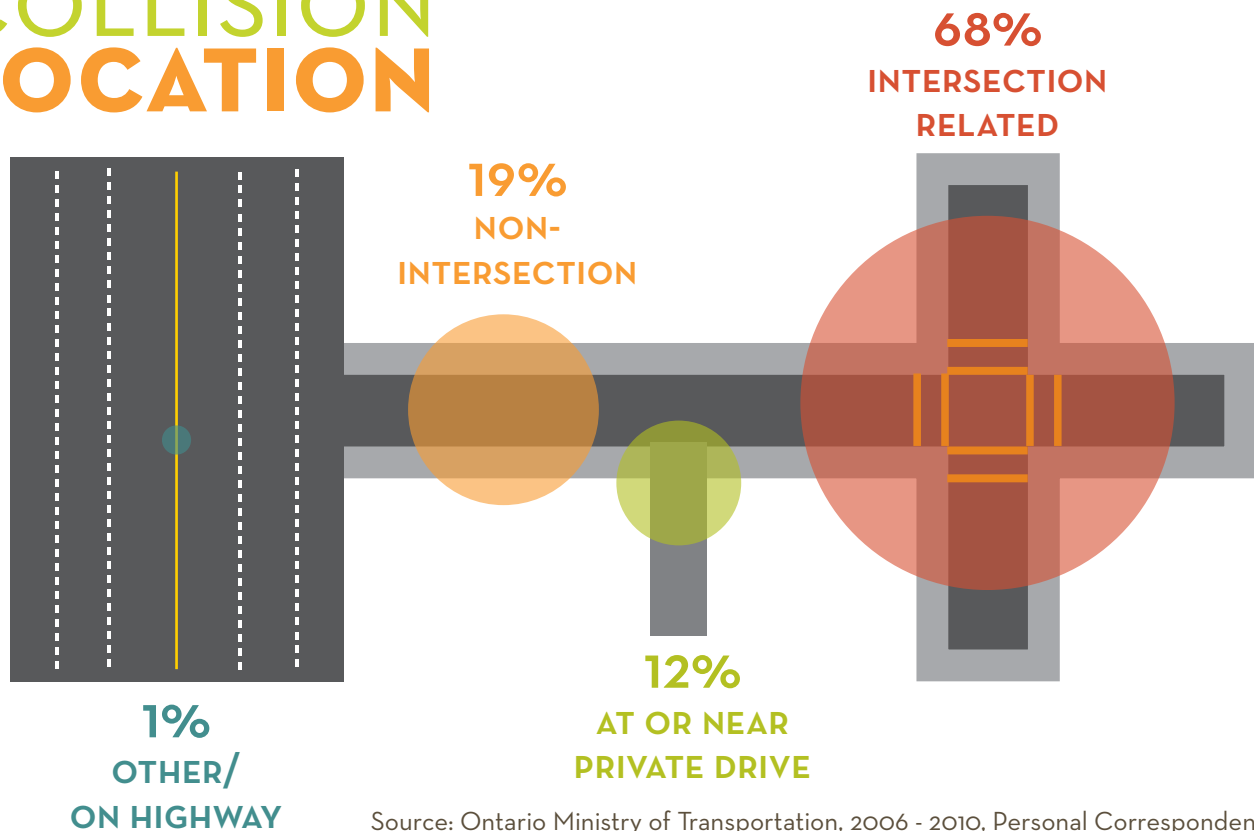


Source: National Ambulatory Care Reporting System, Canadian Institute for Health Information (2003 - 2012)

## Peterborough City and County

To understand why pedestrian injuries and fatalities are occurring in Peterborough, an assessment of each incident was needed. This assessment revealed that 81% of pedestrians injured in Peterborough City and County are due to a collision with a vehicle. Furthermore, an assessment of pedestrian and vehicle collision reports from the MTO between 2006 and 2010 shows that intersections are the most common location for a pedestrian and vehicle to collide. This differs from the Ontario Coroner's findings, wherein the greatest number of pedestrian and vehicle collisions resulting in a pedestrian fatality occurred at uncontrolled mid-block locations on wide arterial streets with fast moving traffic. This discrepancy is likely due to the Coroner only investigating pedestrian deaths, while the Peterborough statistics include analysis of collisions resulting in injury **and** death.

# VEHICLE (CAR, PICK-UP TRUCK, VAN) COLLISION LOCATION



Source: Ontario Ministry of Transportation, 2006 - 2010, Personal Correspondence

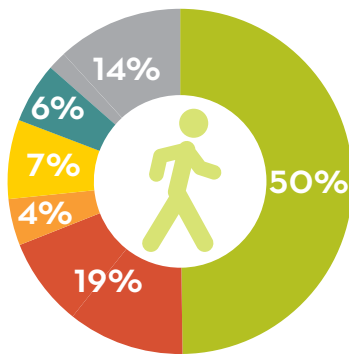


When assessing the actions of pedestrians and drivers at the time a collision, the Peterborough specific statistics are, again, different than the results from the Coroner's Review.

# PEDESTRIAN-VEHICLE COLLISION ACTIONS

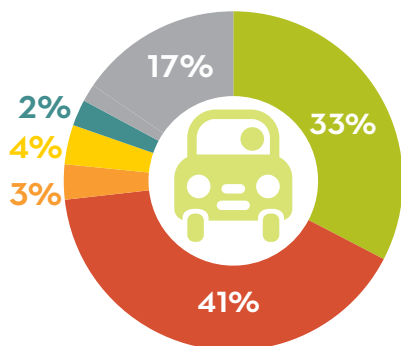
*Peterborough City and County*

## Pedestrian action at time of collision...



- Crossing intersection with right-of-way
- Crossing without right-of-way or traffic control
- Walking on road
- Walking on sidewalk or shoulder
- Running onto the road
- Unknown/other

## Driver action at time of collision...



- Driving properly
- Fail to yield
- Speeding
- Improper turn
- Disobey traffic controls
- Unknown/other

Source: Ontario Ministry of Transportation, 2006 - 2010, Personal Correspondence



Photo Credit: GreenUP



Photo Credit: Susan Sauvé

## CYCLISTS

### *Peterborough City & County*

Between 2003 and 2012 in Peterborough, there were significantly more ED visits for cyclist injuries compared to hospitalizations. Similar to pedestrian injuries, cyclists who visit the ED tend to have injuries that are less severe compared to hospitalizations. It is important to note that the number of cyclists visiting the ED in Peterborough is decreasing over time while the number for Ontario has been fairly stable. A breakdown of cyclists' ED visits and hospitalizations by age group shows that individuals 0 to 19 years of age experience a larger proportion of the injuries in Peterborough compared to the other age groups.

**3283** EMERGENCY DEPARTMENT VISITS  
(2003 - 2012)

**137** HOSPITALIZATIONS  
(2003 - 2012)

**<5** DEATHS  
(2003 - 2009)

Sources: National Ambulatory Care Reporting System, Canadian Institute for Health Information (2003 - 2012)  
Discharge Abstract Database (DAD), Canadian Institute for Health Information (CIHI) (2003 - 2012)  
Statistics Canada, Ontario Registrar General (2003 - 2009)

# EMERGENCY DEPARTMENT & HOSPITALIZATION DEMOGRAPHICS

Peterborough City & County

## Cyclist Injuries



If Peterborough residents were represented by 10 people, they would be the following ages:



If the **CYCLIST EMERGENCY DEPARTMENT VISITS** made by Peterborough residents were represented by 10 people, they would be the following ages:



If the **CYCLIST HOSPITALIZATIONS** for Peterborough residents were represented by 10 people, they would be the following ages:



### Sources: Emergency Department Statistics

Original source: National Ambulatory Care Reporting System (NACRS), Canadian Institute for Health Information (CIHI)

Distributed by: Ontario Ministry of Health and Long-Term Care (MOHLTC): IntelliHEALTH ONTARIO (IntelliHEALTH)

### Hospitalization Statistics

Original source: Discharge Abstract Database (DAD), Canadian Institute for Health Information (CIHI)

Distributed by: Ontario Ministry of Health and Long-Term Care (MOHLTC): IntelliHEALTH ONTARIO (IntelliHEALTH)



When data specific to ED visits are broken down by gender and age it shows that males account for the greater proportion of injuries occurring to cyclists in Peterborough. This trend is similar to that observed provincially; however, Peterborough has a larger proportion of young males getting injured, specifically within the 10-19 years of age category.



Photo Credit: PCCHU

## EMERGENCY DEPARTMENT VISITS FOR PETERBOROUGH RESIDENTS

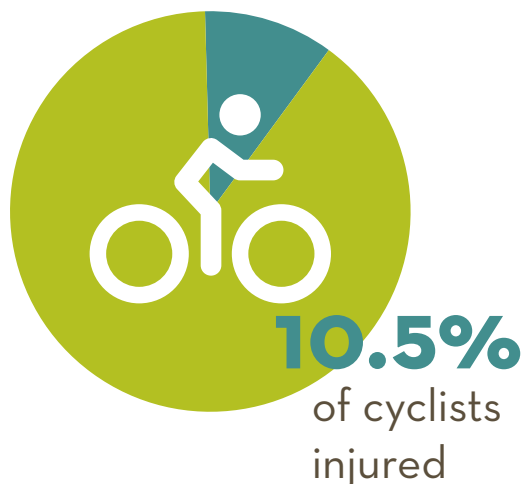
### 2003 - 2012 | CYCLISTS



Source: National Ambulatory Care Reporting System, Canadian Institute for Health Information (2003 - 2012)

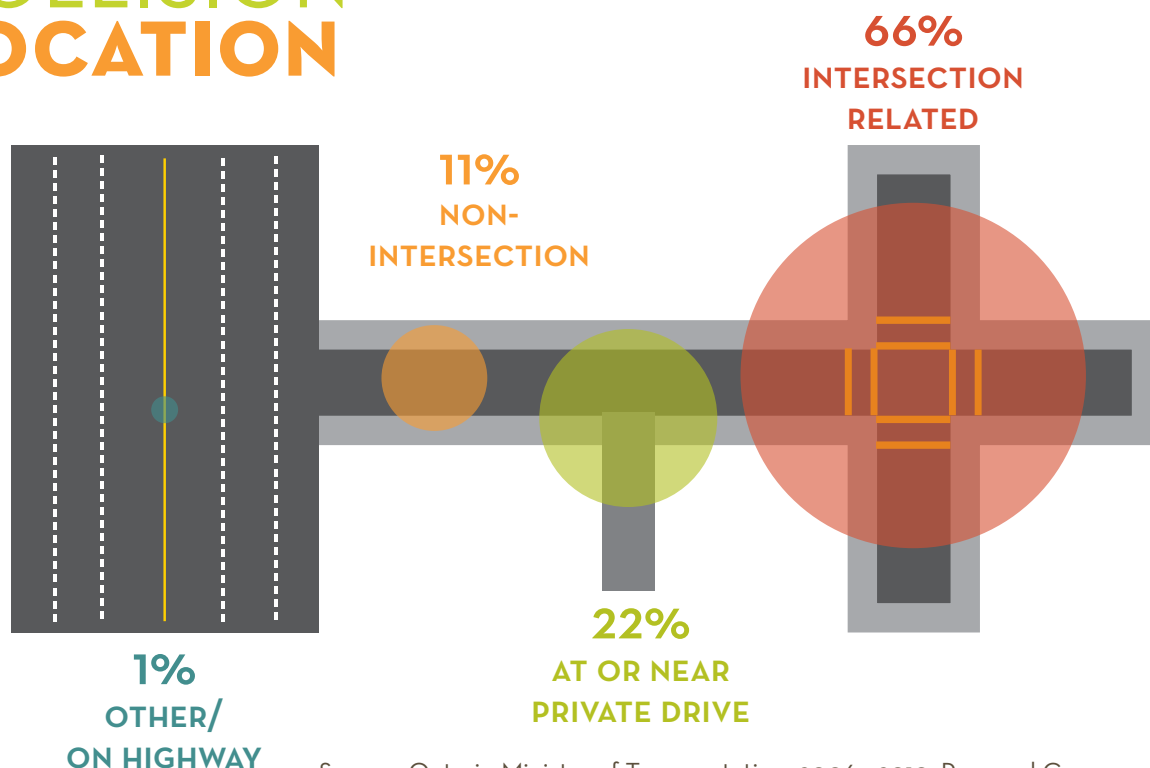


# VEHICLE (CAR, PICK-UP TRUCK, VAN) COLLISION OCCURRENCE



Source: National Ambulatory Care Reporting System, Canadian Institute for Health Information (2003 - 2012)

# VEHICLE (CAR, PICK-UP TRUCK, VAN) COLLISION LOCATION



Source: Ontario Ministry of Transportation, 2006 - 2010, Personal Correspondence

## Peterborough City and County

When assessing the cause of cyclist injuries in Peterborough, it is important to note that only 10.5% of ED visits are due to a collision with a vehicle, which is similar to the trend observed provincially. However, a much larger proportion of cyclists requiring hospitalizations (23.4%) in Peterborough are due to a collision with a vehicle, which is higher than the trend observed provincially. The difference between ED visits and hospitalizations is likely due to the greater severity of injury that results from a cyclist being hit by a vehicle.

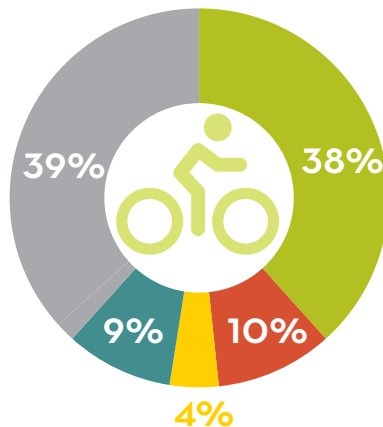
When MTO data from 2006 to 2010 is analyzed, similar to pedestrian injuries, a large proportion of cyclist and vehicle collisions are intersection related. The Coroner's Cyclist Death Review did not analyze the proportion of Ontario cycling deaths that occur at intersections. However, the Coroner did analyze the actions of cyclists and drivers at the time of the collisions and for these statistics it would appear that Peterborough is similar to the findings of the Coroner's Review.

# CYCLIST-VEHICLE COLLISION ACTIONS

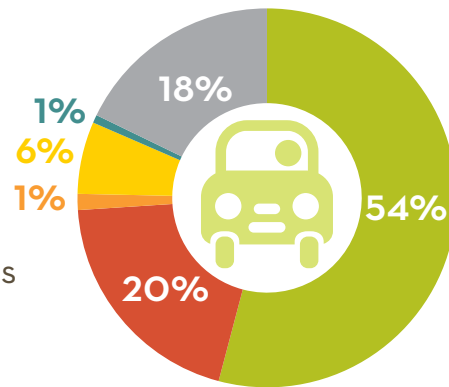
Peterborough City and County

Cyclist action at time of collision...

Driver action at time of collision...



- Driving properly
- Fail to yield
- Speeding
- Improper turn
- Disobey traffic controls
- Unknown/other



Source: Ontario Ministry of Transportation, 2006 - 2010, Personal Correspondence

## MINIMIZING RISKS

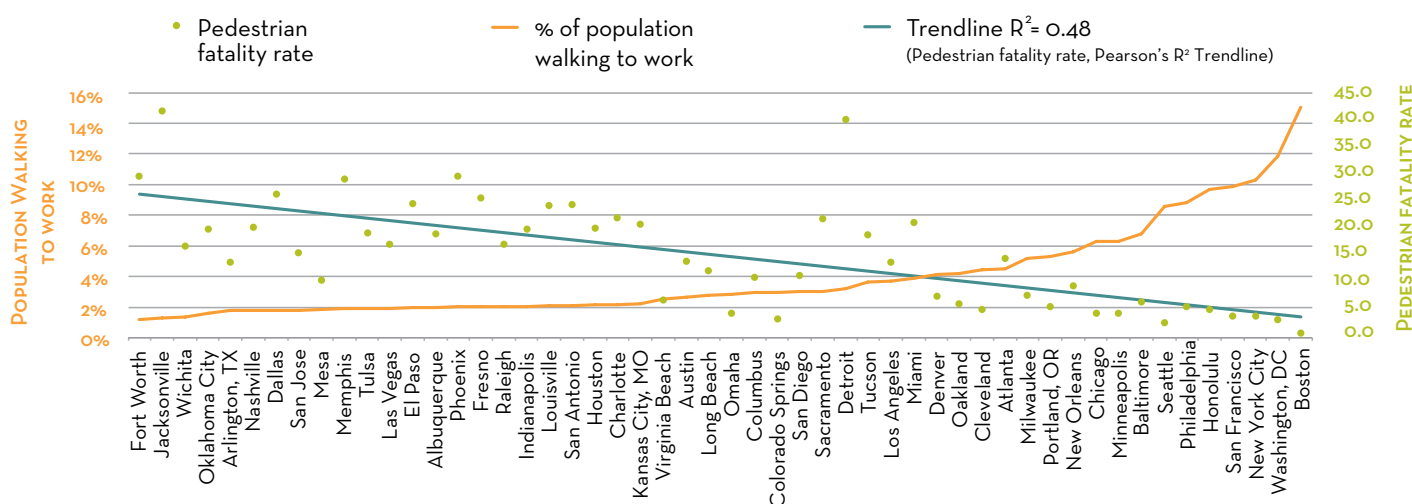
### SAFETY IN NUMBERS

As reviewed in the previous chapter, the health, social, and environmental benefits associated with active transportation are significant. However, there are risks associated with this type of travel. Research from the University of British Columbia shows that a common deterrent of cycling is lack of perceived safety (Winters et al. 2011). In order to encourage more people to use this form of travel there are societal changes as well as individual behavioural changes that can be made to minimize risk and make the activity more enjoyable and safer.

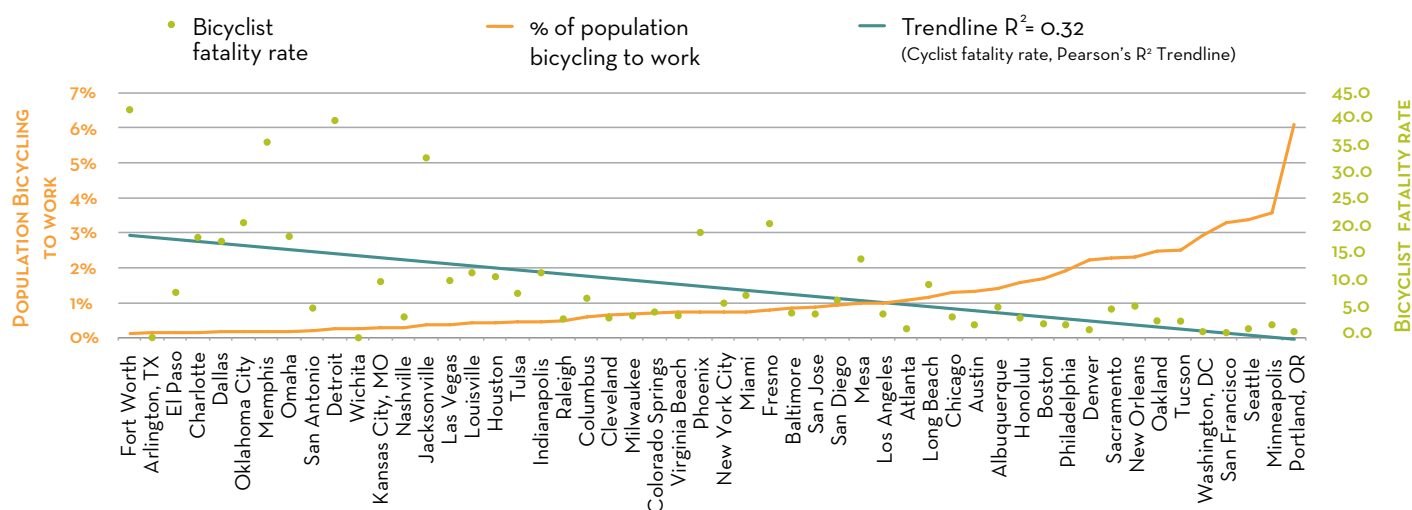
First and foremost, it is critical that transportation infrastructure be designed to accommodate all modes of travel, including active modes. This idea has been validated by numerous studies that have shown a reduction in vehicle-pedestrian and vehicle-cyclist crashes based on infrastructure modifications (Reynolds et al. 2010, Toronto Public Health 2012, Transport Canada 2011b, World Health Organization 2004). Specific to cycling, “a recent review of the impact of infrastructure on cyclist safety concludes that purpose-built bicycle facilities (e.g., on-road bike routes, on-road marked bike lanes, and off-road bike paths) reduce crashes and injuries for cyclists” (Reynolds et al. 2010, 5). In municipalities where immediate infrastructure changes are not possible, municipal officials are creating alternative pedestrian and cyclist routes parallel to main roads in order to minimize the risk for injury and exposure to air pollution (Reynolds et al. 2010).

In addition to transportation infrastructure that accommodates active modes of travel, the volume of pedestrian and cyclist flow may also positively impact their safety. Research consistently shows that increases in the number of people using active modes of travel provides a “safety in numbers” effect for pedestrians and cyclists, whereby increasing the proportion of trips by active modes lowers the risk of injuries per person (Elvic 2009 as cited in Perrotta 2011, Reynolds et al. 2010). This is thought to occur both because drivers are more likely to operate their vehicle carefully and safely around pedestrians and cyclists when they are more accustomed to seeing people walking and cycling, and also because cyclists are more likely to follow road laws when other cyclists are present (AWB 2014). According to the Alliance for Walking and Biking (2014), this theory has proven true in large American cities, as the bicycle and pedestrian fatalities are lowest in cities that have the highest percentage of people using these modes to travel to and from work.

## RATES OF WALKING RELATIVE TO PEDESTRIAN FATALITY RATES (IN LARGE AMERICAN CITIES)



## RATES OF CYCLING RELATIVE TO CYCLIST FATALITY RATES (IN LARGE AMERICAN CITIES)



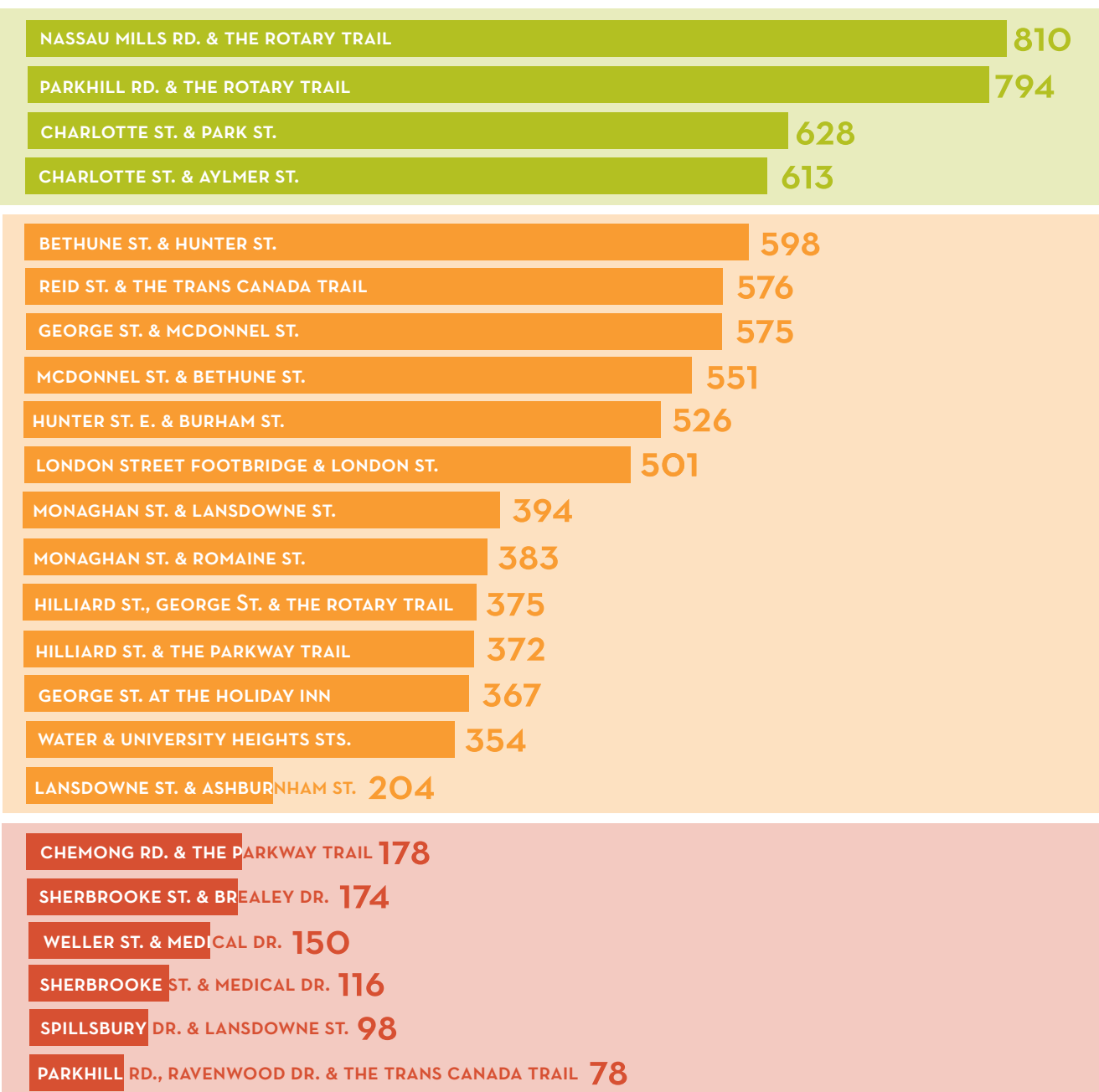
Source: Alliance for Biking and Walking 2014 Benchmarking Report (page 81)  
 Original Source: American Community Survey 2009 - 2011 & Fatality Analysis Reporting System (2009 - 2011)

# CYCLING SAFETY IN NUMBERS

In a recently published American study, safety in number levels were developed as a strategy to determine the approximate number of cyclists per day that might be required to observe a shift in safety (Nordback 2012). Nordback (2012) determined that intersections with less than 200 cyclists per day

were least safe for cyclists and that intersections with more than 600 cyclists per day were relatively safe. While we do not have any regional data to substantiate a local 'safety in numbers' effect, the 2012 and 2013 city-wide cyclist counts help to identify the intersections that presently have the greatest concentrations of cyclists in the city of Peterborough.

## INTERSECTION ANNUAL AVERAGE DAILY BICYCLISTS ZONE CLASSIFICATION SUMMARY:



Source: Peterborough Cyclist and Pedestrian Counts, 2013





Photo Credit: Paula Mattie

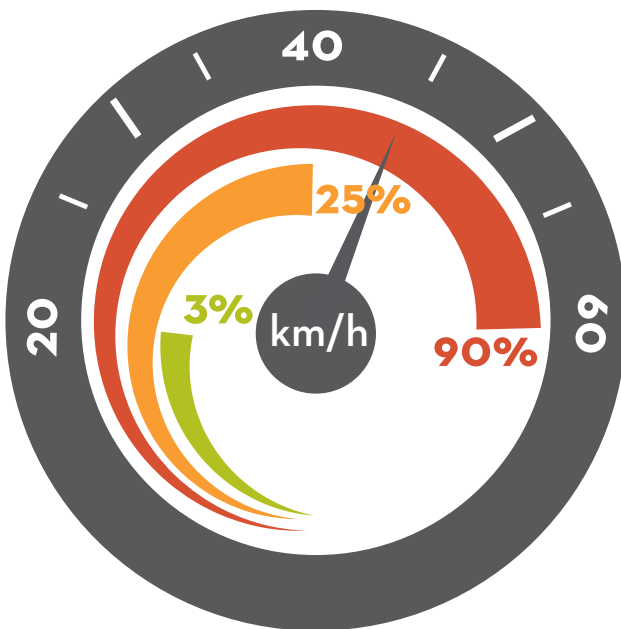




Photo Credit: Brianna Salmon

## VEHICLE SPEEDS

Although it is useful to consider the number of cyclists travelling through local intersections, it is important to note that high levels of pedestrian and cyclist activity alone does not eliminate all risk. To ensure optimal safety for pedestrians and cyclists, there must be appropriate infrastructure, legislation, and enforcement. Specific to legislation and enforcement, laws developed to reduce vehicle speeds have a substantial impact on the number of cyclists and pedestrians being injured or killed (Harris et al. 2011, Mowat et al. 2014, Reynolds et al. 2010, Rosen et al. 2011). For pedestrians and cyclists, the chance of being fatally injured by a vehicle increases as the speed of the vehicle increases (Mowat et al. 2014). Sidewalks, traffic circles, on-street parking, and landscaping are all forms of traffic calming shown to be effective in reducing traffic speeds (Mowat et al. 2014).



Probability of a pedestrian fatality, based on the impact speed of a car.

Source: Pasanen E., 1991 (Planning Alliance, 2014)

Lastly, in addition to societal changes to decrease the risk of injury, individual behavioural changes must be made to reduce the risk of injury. One of the most important individual actions to reduce personal risk is proper use of safety equipment, such as helmets. According to Parachute, a nationally recognized injury prevention organization, “a properly fitted and correctly worn bike helmet can make a dramatic difference, cutting the risk of serious head injury by up to 85 per cent. This means that four out of five brain injuries could be prevented if every cyclist wore a helmet.” (Parachute 2014). Additionally, Public Health Ontario (2014) recently conducted a systematic review of research on the benefits associated with helmet use. The study revealed conclusive evidence that wearing a bike helmet resulted in fewer hospitalizations, a decrease in head and non-head injuries, a reduction in the severity of injuries, and fewer deaths. Despite the many benefits associated with helmet use, less than half of cyclists observed during the City’s 2012 cyclist count project were wearing a helmet (Peterborough Pedestrian & Cyclist Counts 2012).

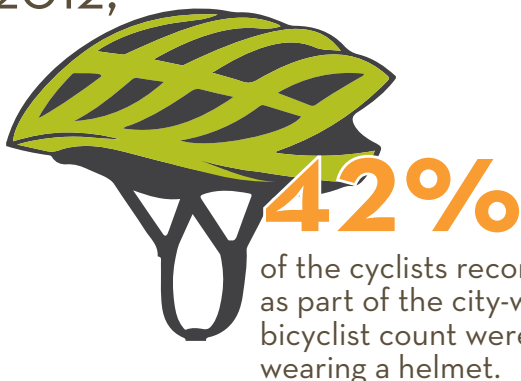


Photo Credit: Brianna Salmon

## CYCLISTS WHO WEAR HELMETS

*City of Peterborough*

In 2012,



In 2013,



Source: Peterborough Cyclist and Pedestrian Counts, 2012 & 2013

# CONCLUSION

Developing a comprehensive set of indicators to measure the status of active transportation in Peterborough City and County has been an important exercise. While this report did not provide an exhaustive review of all potential active transportation indicators, this inaugural report does provide a comprehensive overview of the factors that influence walking and cycling in the Peterborough region. Enhancing our understanding of these factors in a local context will support evidence-informed decision-making and will increase our ability to develop strategic infrastructure, programming, and advocacy interventions. This report will also provide us with a robust set of indicators against which future progress can be measured and situated.

That this report was created through a partnership between government, public health and an environmental charity is also an important feature, and one that is quite unique in Ontario. Maintaining a collaborative approach to benchmarking helps to legitimize and integrate the priorities being expressed by public health and the environmental nonprofit sector, and also helps to ensure that these are made a part of the evaluative process. This, then, broadens our understanding of what 'progress' means with respect to walking and cycling, and represents a more inclusive approach to benchmarking. This report, and others like it, provides an example of how cross-sectoral partnerships can move beyond external advocacy and toward more integrated collaboration with local or regional governments.

Until another edition of the report can be published, indicators from this report can be measured against the same indicators from other municipalities to determine whether the City and County of Peterborough are keeping pace with the rise in active transportation use being observed across North America. In the coming years, all Canadian municipalities will face challenges when it comes to understanding and measuring rates of active transportation in their jurisdictions. While the reintroduction of a mandatory long form census would go a long way toward supporting critical benchmarking work in this field and others, individuals undertaking these activities will need to adapt to a changing data landscape and will need to find creative ways to understand emergent patterns in their communities.

Although the availability of data already limits the extent to which direct relationships between transportation and health can be established, the authors are pleased with the connections that this report has been able to establish, and hope that this work helps policy makers, planners, and individuals better understand how the built environment shapes our transportation decisions, and how those decisions, in turn, impact our individual and environmental health.

In recent years, there has been a surge in the number of policies, plans, and programs designed to support and increase the use of active transportation in the Peterborough area. As a result of this work, we are beginning to see increases in rates of walking and cycling. With



continued investment, there is the potential for even greater gains to be made in both the City and County of Peterborough.

To sustain the work begun through the development of this report, the authors and their respective organizations will endeavour to:

- Monitor these and other appropriate indicators of active transportation and release a follow-up report in a minimum of 5 years;
- Continue to develop more robust local data collection processes, including the local pedestrian and cyclist counts;
- Develop this existing cross-sectoral partnership and work to integrate additional partners into the evaluative process; and,
- Work to further develop, or advocate for the development of, infrastructure, policies, and programs that are supportive of active transportation.

With partners across sectors working to support active transportation in this community, there is no doubt that progress across a number of indicators will be made by the time a follow-up report is developed. This is, indeed, an exciting time to be monitoring walking and cycling trends across both the City and County of Peterborough.

Many thanks are, again, extended to the individuals and organizations that helped to make this report possible.

# RESOURCES

## GUIDE TO LOCAL & PROVINCIAL DOCUMENTS

### ACTIVE TRANSPORTATION BY-LAW REVIEW | CITY OF PETERBOROUGH

[www.peterborough.ca/Assets/City+Assets/TDM/Documents/Display+boards+for+active+transportation+By-Law+public+consultation+3.pdf](http://www.peterborough.ca/Assets/City+Assets/TDM/Documents/Display+boards+for+active+transportation+By-Law+public+consultation+3.pdf)

### COMPREHENSIVE TRANSPORTATION PLAN | CITY OF PETERBOROUGH

[www.peterborough.ca/Assets/City+Assets/Transportation/Documents/Transportation+Plan/2012+Comprehensive+Transportation+Plan+Report+-+Shorter.pdf](http://www.peterborough.ca/Assets/City+Assets/Transportation/Documents/Transportation+Plan/2012+Comprehensive+Transportation+Plan+Report+-+Shorter.pdf)

### CYCLEON | GOVERNMENT OF ONTARIO

[www.mto.gov.on.ca/english/pubs/cycling-guide/pdfs/MTO-CycleON-EN.pdf](http://www.mto.gov.on.ca/english/pubs/cycling-guide/pdfs/MTO-CycleON-EN.pdf)

### GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE | GOVERNMENT OF ONTARIO

[www.placestogrow.ca/content/ggh/plan-cons-english-all-web.pdf](http://www.placestogrow.ca/content/ggh/plan-cons-english-all-web.pdf)

### ONTARIO TRAILS STRATEGY | GOVERNMENT OF ONTARIO

[www.mtc.gov.on.ca/en/sport/recreation/A2010\\_TrailStrategy.pdf](http://www.mtc.gov.on.ca/en/sport/recreation/A2010_TrailStrategy.pdf)

### PROVINCIAL POLICY STATEMENT | GOVERNMENT OF ONTARIO

[www.mah.gov.on.ca/AssetFactory.aspx?did=10463](http://www.mah.gov.on.ca/AssetFactory.aspx?did=10463)

### PROVISION OF SIDEWALKS POLICY | CITY OF PETERBOROUGH

[www.communityerp.ca/AssetFactory.aspx?did=12320](http://www.communityerp.ca/AssetFactory.aspx?did=12320)

### PUBLIC TRANSIT OPERATIONS REVIEW: THE ROUTE AHEAD | CITY OF PETERBOROUGH

[www.peterborough.ca/Assets/City+Assets/Transit/Transit+Operations+Review/Transit+Operations+Review+Final+Report.pdf](http://www.peterborough.ca/Assets/City+Assets/Transit/Transit+Operations+Review/Transit+Operations+Review+Final+Report.pdf)

### RECREATIONAL TRAILS MASTER PLAN | TOWNSHIP OF SELWYN

[www.selwintownship.ca/en/discoverourtownship/resources/2014/Trails\\_Master\\_Plan\\_FINAL\\_June\\_17.pdf](http://www.selwintownship.ca/en/discoverourtownship/resources/2014/Trails_Master_Plan_FINAL_June_17.pdf)

### SIDEWALK STRATEGIC PLAN | CITY OF PETERBOROUGH

[www.peterborough.ca/Assets/City+Assets/TDM/Documents/Sidewalk+Strategic+Plan.pdf](http://www.peterborough.ca/Assets/City+Assets/TDM/Documents/Sidewalk+Strategic+Plan.pdf)

### TRANSPORTATION MASTER PLAN UPDATE | COUNTY OF PETERBOROUGH

[cms.county.peterborough.on.ca/assets/uploads/documents/TMP\\_County\\_of\\_Peterborough\\_FINAL\\_1.pdf](http://cms.county.peterborough.on.ca/assets/uploads/documents/TMP_County_of_Peterborough_FINAL_1.pdf)

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