

Appendix VI: Existing Conditions Assessment

Cycling Master Plan Update - Existing Conditions Assessment

June 15, 2017

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1. Introduction

This document summarizes the existing conditions analysis for cycling in Mississauga to date. Key findings are summarized by data source. Using available data, needs and opportunities have been identified to inform the outcomes of the Cycling Master Plan Update.

2. Cycling Network

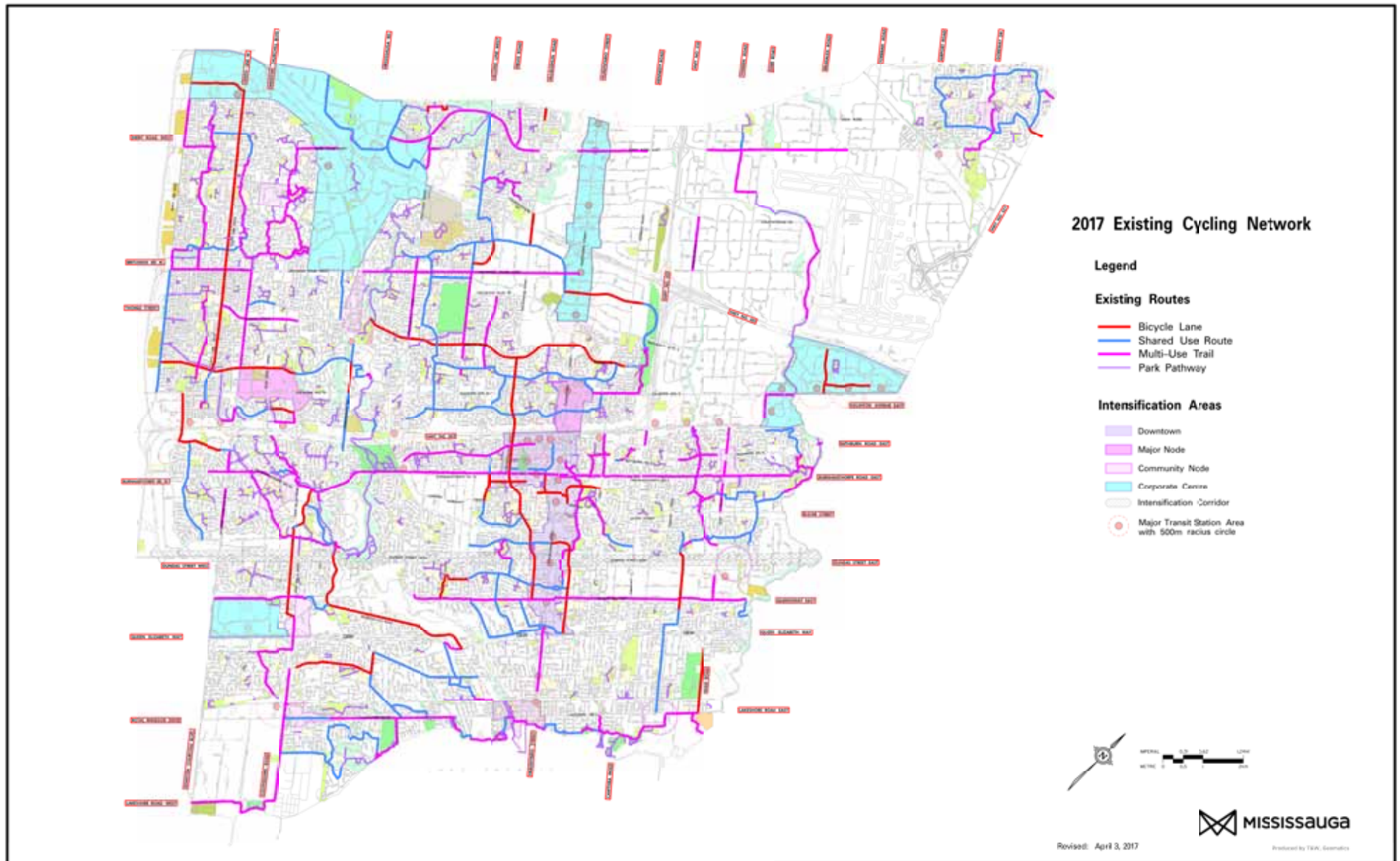
The City of Mississauga has a developing cycling network composed of shared roadways (signed bicycle routes and sharrows), conventional bicycle lanes, boulevard multi-use trails, and off-road trails in parks. Figure 1 shows the existing 2017 bicycle network. In 2010, the City's Cycling Master Plan built upon existing trails and bicycle facilities to propose an expanded and connected bicycle network that provides access to key destinations like public transit. Table 1 shows the kilometres of cycling facilities by type that existed prior to the 2010 plan and up to the time of this report. These facilities have been implemented in support of the 2010 Cycling Master Plan Goals:

- Foster a culture where cycling is an everyday activity;
- Build an integrated cycling network as part of a multi-modal transportation system;
- Adopt a "Safety First" approach for cycling in Mississauga

Table 1: Existing Cycling Network Facilities by km

Bicycle Facility Type	# of kms before 2010	# of kms 2010-2016	Total
Bicycle Lanes	29	25	54
Boulevard Trails	61	27	88
Off-Road Trails	205	17	221
Shared Routes	79	12	91
TOTALS	374	80	454

Figure 1: Existing 2017 Cycling Network



3. Bicycle Ridership

There are several data sources that include bicycle ridership data for Mississauga including regional data collected through the Transportation Tomorrow Survey, counts taken on specific bicycle facilities by the City of Mississauga and Region of Peel, turning movement count data collected at certain intersections, and cordon count data collected by the Region of Peel.

As expected, counts are highest from the beginning of May to end of September with a peak over the summer months. Bicycle activity is reduced but does occur throughout the winter months. These patterns are typical in most Canadian cities as winter weather creates obstacles due to a decreased level of comfort for cyclists from snow and ice on riding surfaces and cold, wet weather.

a. Transportation Tomorrow Survey (2006, 2011)

The Transportation Tomorrow Survey (TTS) is supported by local and provincial government agencies and collects information from randomly selected households about how, why, and where household members travel on a typical day in the Greater Toronto Area (GTA) and Greater Golden Horseshoe (GGH). The information is used to help guide transportation planning and investment decisions.

When using this data it is important to note that cycling is typically under-reported in the TTS. The survey is delivered to land line (home phone) telephones only and therefore is likely less representative of youth and younger adults who tend to cycle more often than older residents. TTS also does not record recreational trips which could represent a significant number of cycling trips.

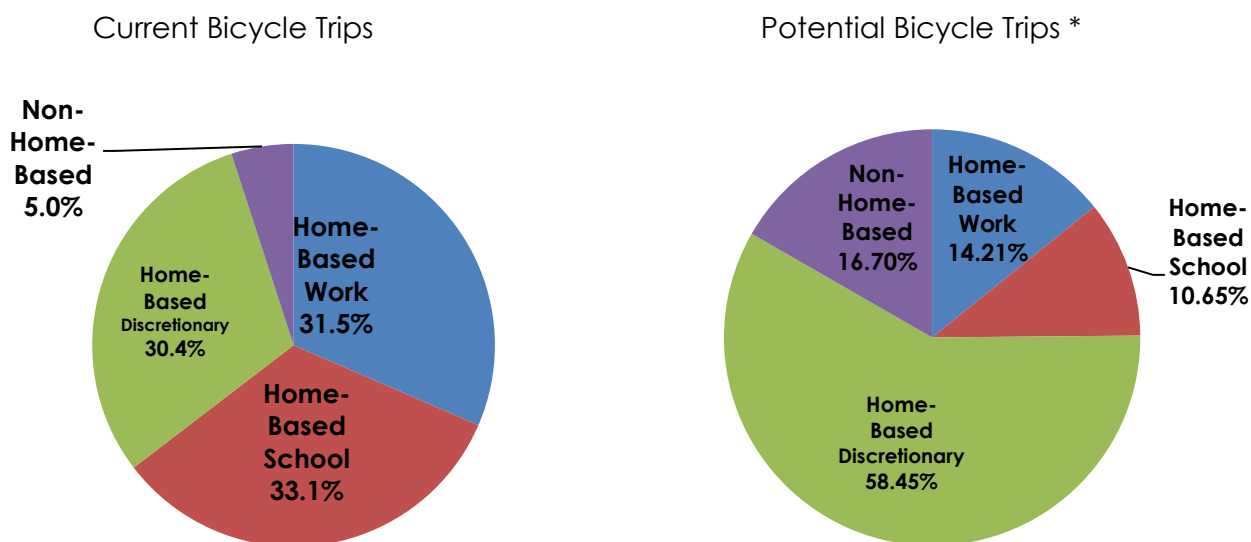
The most recent TTS data available for analysis is from 2011. This data shows that 0.3% of trips in Mississauga are taken by bicycle. According to this data, there has been no increase in bicycle mode share in Mississauga since the 2006 TTS.

The data in table 2 shows a slight increase since 2006 in bicycle trips to work and in discretionary trips or other non-home-based trips, but a 15% decrease in bicycle trips to school.

Table 2: Percentage of cycling trips for each trip purpose in Mississauga

Data Source	Home-Based Work	Home-based School	Home-based Discretionary	Non Home-based
2006 TTS	27.1%	47.7%	23.7%	1.5%
2011 TTS	31.5%	33.1%	30.4%	5.0%

Approximately 84% of bicycle trips in Mississauga are 5km long or less. On a typical weekday, approximately 457,030 automobile trips in Mississauga are 5 km or less. Many of these trips could feasibly be taken by bicycle.

Figure 2: Trip Purpose of bicycle trips and potential bicycle trips (TTS 2011)

*non-cycling, non-walking trips 5km or less

b. Peel Region Cordon Count Data (2006, 2011, 2016)

The Cordon Count Program is administered by Peel Region along with other GTA Regional municipalities and the Ontario Ministry of Transportation. Full counts are conducted every 5 years and partial counts in between. The program collects data on how people travel in the Greater Toronto Area (GTA). Data is collected at counting stations located at major crossings, rail lines and building entrances throughout the Region. Counts are recorded every 15 minutes over a 15-hour period, from 5:30 am –

8:30 pm, Mondays to Thursdays, from May to June. Weather is not recorded as part of the data, but can have a significant impact on cyclist counts as cyclist volumes are typically less during inclement weather.

Bicycle counts obtained from the Cordon Count Program from 2006, 2011 and 2016 are shown in Table 3. Counts show a moderate increase in total volumes of cyclists in Mississauga over 11 years

Table 3: Total cyclist counts and stations with highest bicycle counts recorded through the Cordon Count Program (full count years)

Year	Total cyclist counts	Busiest Count Station
2006	7028	Lakeshore Road at Credit River
2011	9862	Dundas Street at Credit River
2016	13359	Erin Mills Parkway south of Highway 403

Partial cordon counts conducted in 2009 and 2014 showed the Lakeshore Road and Credit River station as the busiest. This station is consistently in the top 5 busiest stations for all count years.

c. Mississauga Bicycle Count Data (2013-2016)

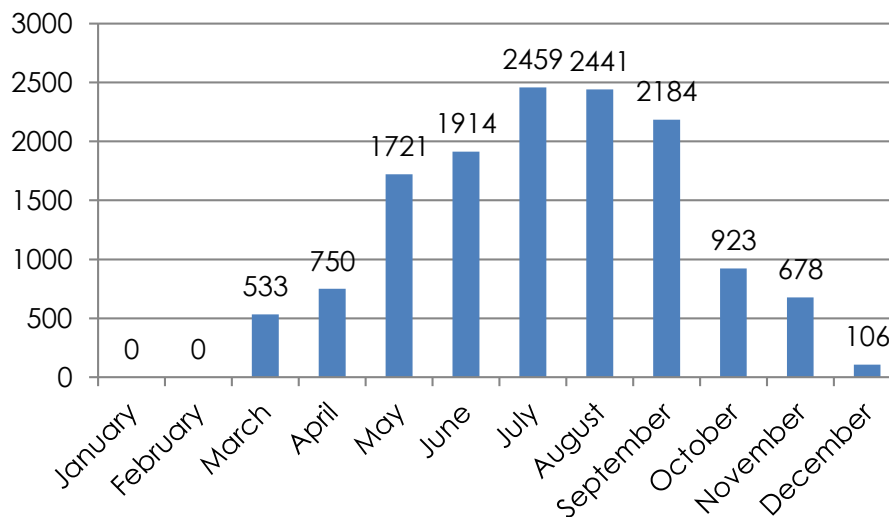
The City of Mississauga uses a combination of permanent and temporary bicycle counters to track usage of specific bicycle facilities.

Permanent Counter: One permanent bicycle counter is located on the Burnhamthorpe Road multi-use trail east of Duke of York Boulevard. Table 4 shows count data from 2013-2016. Months showing as NA indicate months where data irregularities made the results unreliable due most likely to technical issues with the counting equipment. While counts showed an increase from 2014 – 2015, a decrease was observed in 2016. Closer monitoring of the counting equipment will be needed to improve data integrity. Continued data collection will provide more insight into monthly and daily trends over time. Monthly counts from 2016 are shown in Figure 4. As expected, counts are highest during the summer months and shoulder seasons from May to September.

Table 4: Monthly bicycle counts, Burnhamthorpe Road multi-use trail 2013-2016

Month	2013	2014	2015	2016
January		199	233	NA
February		86	NA	NA
March		216	432	533
April		1434	1929	750
May		3216	4424	1721
June		NA	4628	1914
July		NA	5997	2459
August		4898	5201	2441
September	4169*	4360	4146	2184
October	4303	2136	2666	923
November	998	864	NA	678
December	628	554	NA	106
ANNUAL	10,098	17,963	29,656	13,709

* Monitoring began on September 13, 2017

Figure 4: 2016 Monthly Cyclist Volumes on Burnhamthorpe Multi-Use Trail

Temporary Counting Locations: Three locations are equipped with permanent inductive loops and one rotating data logger to collect data at Mississauga Road north of the QEW, Tenth Line West south of Thomas St, and Confederation Parkway north of the Queensway. Data collected at these locations is limited due to problems with equipment maintenance and installation. In future these locations may be made permanent to improve the data collection.

Temporary, Mobile Counter: a mobile tube counter is used as part of the annual program for collecting bicycle counts from multiple sites. These counts are typically taken before and after the implementation of new facilities, or during events like Bike to Work Day to determine usage on specific routes. Table 5 shows count data on four bikeway facilities from 2013-2015. No counts were taken on these routes in 2016. Five of the eight count locations showed a slight decrease in cyclist volumes from 2014 – 2015. Truscott Drive showed a 25% (Eastbound) to 30% (westbound) increase, and Erin Centre Boulevard showed a 33% increase in bicycle activity in the Eastbound direction.

The Community Services Division is currently developing a Parks Monitoring program which will include bicycle counters on trail facilities.

Table 5: Mobile Bicycle Count Data 2013-2015

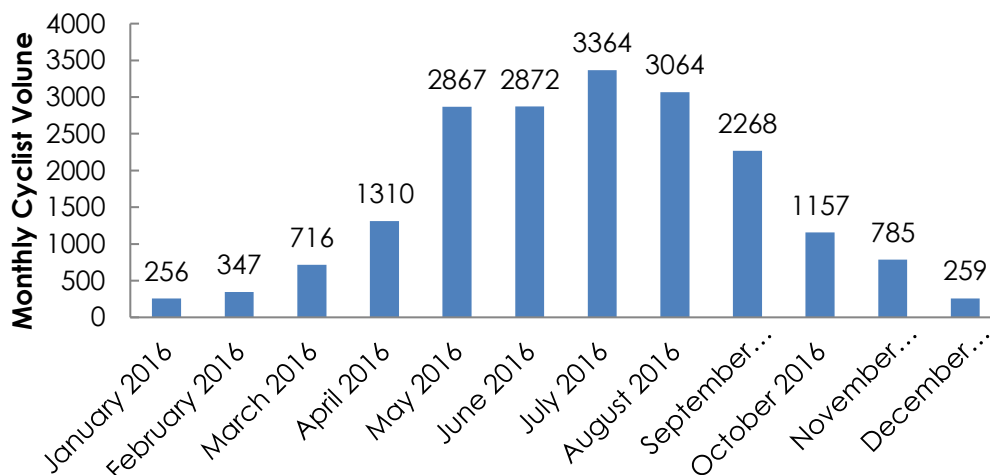
Mobile Tube Counter Location	2013 Average Daily	2014 Average Daily	2015 Average Daily	% increase 2014 to 2015
Bristol Road (EB)	22	42	24	-75%
Bristol Road (WB)	24	25	18	-39%
Camilla Road (SB)	-	25	23	-9%
Camilla Road (NB)	-	27	21	-29%
Erin Centre Boulevard (EB)	-	14	21	33%
Erin Centre Boulevard (WB)	-	10	9	-11%
Truscott Drive (EB)	-	30	40	25%
Truscott Drive (WB)	-	31	44	30%

d. Peel Region Bicycle Count Data (2016)

Peel Region installed one permanent counter in Mississauga in late 2015 on the multi-use trail in the south boulevard of Britannia Road west of Terry Fox Way. 2016 monthly cyclist counts are shown in Figure 5. Peel Region's developing counting program includes cyclists and pedestrians and aims to capture long term trends, seasonal fluctuations, impacts of infrastructure investments, and set baselines.

The Region intends to steadily expand the bicycle monitoring program. Future counters are planned to monitor the bike lanes on Dixie Road south of the QEW.

Figure 5: 2016 Monthly Cyclist Volumes at the Britannia Eco-Counter Location



e. Turning Movement Counts

City of Mississauga turning movement count (TMC) data has not been included in this assessment. TMCs are manual counts taken at specific intersections. Count methodology records cyclists' movements through intersections, however cyclists riding on the sidewalk or crosswalk are recorded as pedestrians. Counters are directed to prioritize motor vehicles which could make it difficult to accurately record cyclist activity at very busy intersections. In addition, intersections where counts are taken are typically, although not exclusively, major, signalized intersections. These intersections may not be locations where cyclists are travelling if there are alternative, more comfortable routes available.

4. Strava Data (2016)

The City of Mississauga purchased 2016 data from Strava.com, a mobile app that enables cyclists to record the distance, time and route of their cycling trips and provides a social media platform for cyclists. The 2016 data shows approximately 80,000 cycling trips recorded in the City of Mississauga and includes trip counts, route choice, trip purpose (commute or recreation) origin/destination data, crossing times at intersections, and age and gender of users (when reported). Slightly less than half of the trips recorded on Strava (44% or 34,780 trips) were identified as commute trips. Figures 6, 7 and 8 show the demographic of people recording cycling trip data with Strava in Mississauga.

Figure 6: Gender of 2016 Strava users

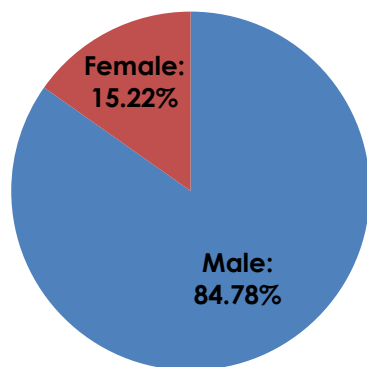


Figure 7: Age Breakdown of Male Strava Users

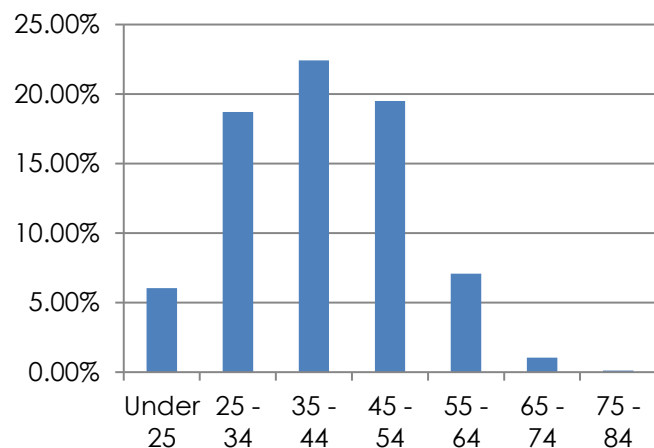
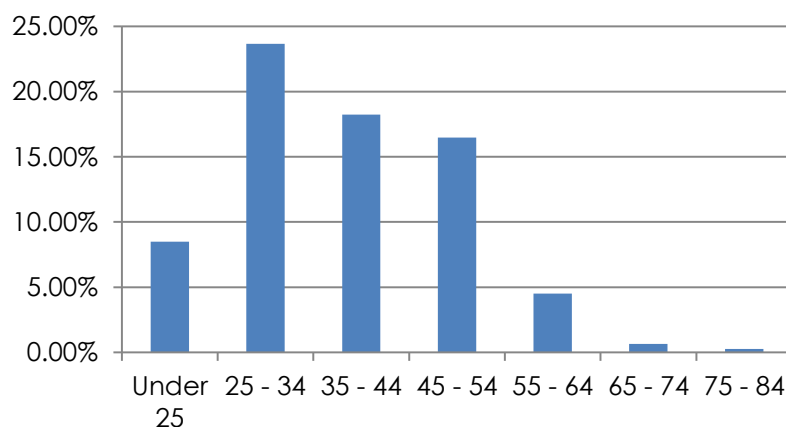


Figure 8: Age Breakdown of Female Strava Users



Trends observed in the 2016 Strava data include:

- A preference among Strava users for bike lanes over multi-use paths;
- Relatively high activity on the following corridors: 10th Line, Mississauga Rd, Atwater Avenue / Mineola Road, and Lakeshore Road;
- Lakeshore Road users tend to stay on-road rather than use the boulevard trail;
- Lakeshore Road was the most popular route for Strava users commuting between Toronto and Mississauga, followed by Queensway, and Convair Drive (via Renforth Drive);
- Meadowvale Boulevard was the most popular route for commuter cyclists crossing the border with Brampton. Other inter-municipal crossings across the Highway 401 / 407 corridors between Brampton and Mississauga include Ninth Line, Winston Churchill Boulevard, Financial Drive, McLaughlin Road, and Goreway Drive;
- Lakeshore Road West and Eglinton Avenue West were the most popular commuting routes among Strava users travelling between Oakville and Mississauga, followed by Burnhamthorpe Road West and Truscott Drive
- Early 2017 data (January to March) shows low trail use as compared to on-road cycling in those same months, which could be related to trail conditions and snow clearance from trails;

Heat maps in Figures 9 and 10 show the locations where Strava users are cycling for commuting and recreational purposes in Mississauga.

Figure 9: Heat Map of Total Strava Commutes in 2016

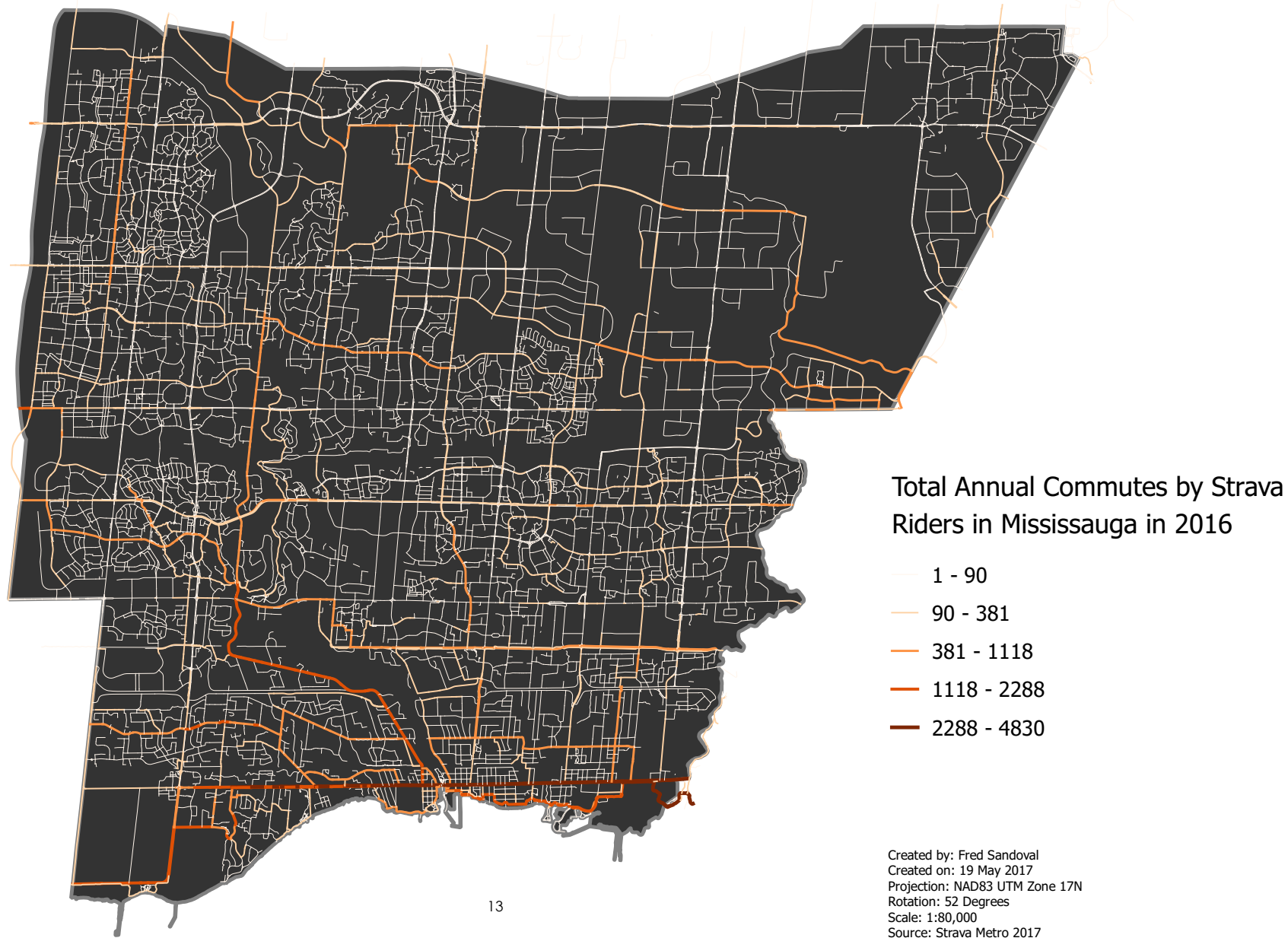
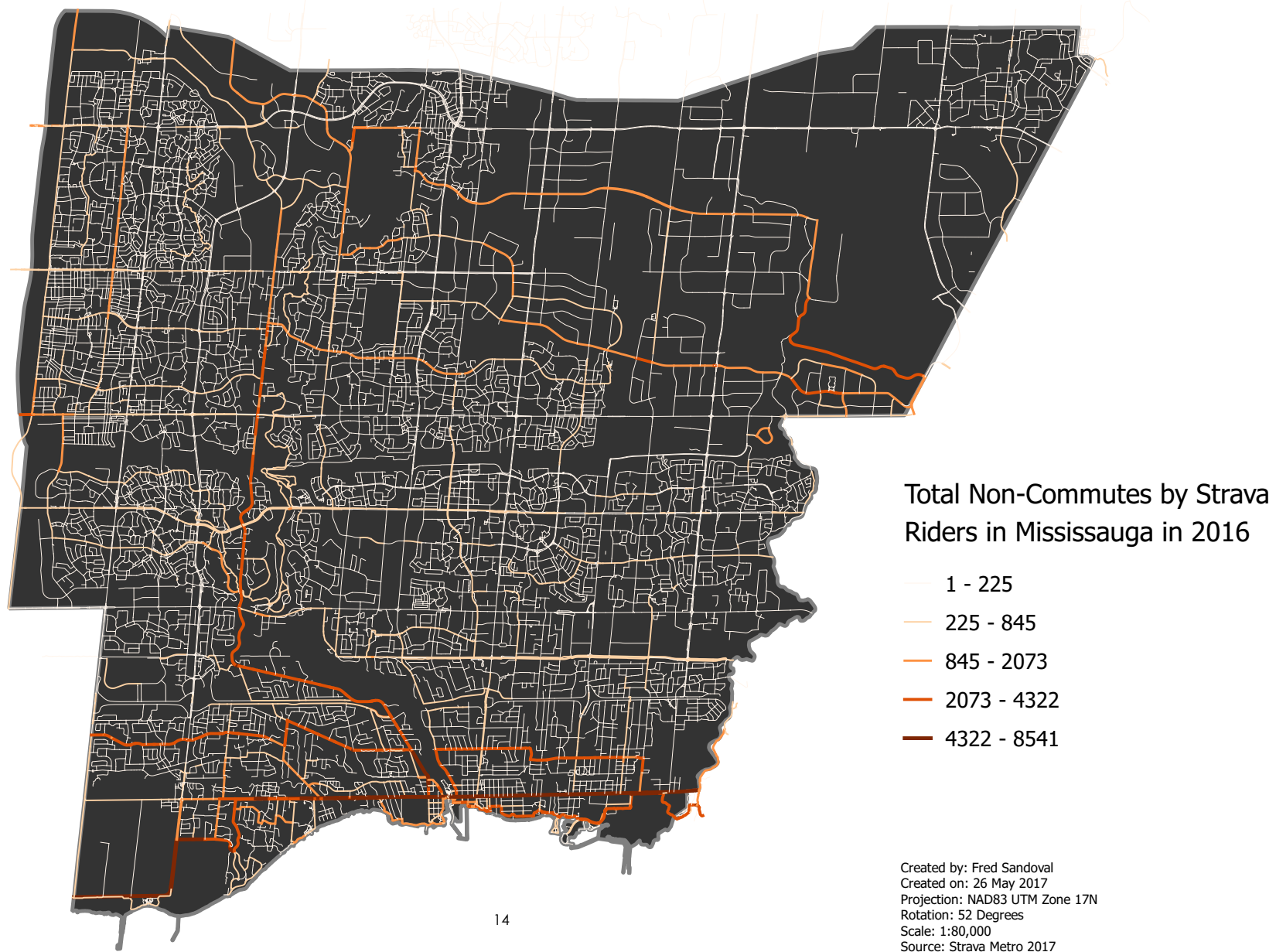


Figure 10: Heat Map of Total Strava Recreational Rides in 2016



5. Workplace Commute Data

Workplace Commute data is gathered and analyzed by the Transportation Management Association (TMA), Smart Commute Mississauga / SustainMobility.

a. Smart Commute Survey Data (2015-2017)

Smart Commute surveys are voluntary surveys delivered quarterly among the TMA's business members. The first survey in Mississauga was conducted by SustainMobility in October 2015. Highlights of cycling data from Mississauga businesses collected through the survey is as follows:

- Since October 2015, 42 surveys have been delivered with 15,851 respondents.
- 2% of respondents said they already cycle to work.
- Just under a quarter of respondents said they were definitely (8%) or probably (13%) willing to cycle
- Only 12% of respondents said they had secure or sheltered bicycle parking at work and 14% had shower and locker facilities at work.
- Only 16% of employees surveyed claimed that cycling lanes and pedestrian paths were available to them.
- The majority of respondents said they were definitely not willing to cycle (64%)
- Just under half of employees (45%) said that the commute distance was too great to walk or cycle.

b. Mississauga Corporate Centre Audits

SustainMobility analyzed commuter behaviour and opportunities to shift to sustainable transportation modes at three corporate centres in Mississauga: Meadowvale Business Park, Downtown Mississauga, and the Airport Corporate Centre.

Meadowvale Business Park (2013):

There are 756 employers in Meadowvale Business Park and approximately 33,599 employees. None of the employees surveyed said they travel by bicycle to work. However, more than 4,000 employees (13%) live within cycling distance of their workplace (5 km or less). 15% of employees surveyed (approximately 655 people) said that they were interested in cycling to work. There are significant barriers to cycling in this area, including busy arterial roads, the Highway 401 and interchange at Mississauga Road, and a lack of connected and comfortable cycling routes.

Downtown Mississauga (2014):

There are 382 employers and approximately 10,028 employees in Downtown Mississauga. Half (51%) of the people who work or go to Sheridan college in the Downtown live within 10 km of their office / school, and 27% are within cycling distance (5km or less). However, only 1% of people working in the Downtown are currently

cycling to work, and 1% of Sheridan College students cycle to school. Twenty percent of employees surveyed (approximately 762 people) said they are interested in cycling to work. Twenty-seven percent of survey participants who commute to Sheridan College said they were interested in cycling to work.

Airport Corporate Centre (2014):

The Airport Corporate Centre includes 439 employers and 18,899 employees. Five out of 2,404 commuters who participated in the commuter survey (0.2%) indicated that they typically cycle to work. However, 14% of those surveyed (317 employees) said that they were interested in cycling to work. Four percent of employees (approximately 756 people) live within easy cycling distance (5 km or less). Currently, the Etobicoke Creek Trail is the only cycling route that provides access into the Airport Corporate Centre.

6. School-Based Active Travel (2016-2017)

Region of Peel's School Travel Planning (STP) program gathers data on school travel through surveys and traffic counts at participating schools.

a. School Travel Traffic Count Data Collection Project

In 2016, Peel Public Health initiated a School Travel Traffic Count Data Collection Project as part of their efforts to reduce traffic congestion around schools and promote safety by encouraging more students to walk and/or cycle to and from school. Manual traffic counts were conducted for two days at participating elementary and middle schools to gather baseline data on student travel behaviours. Traffic counters recorded the number of students who were driven, walked, cycled, or used a scooter or skateboard to travel to and from school.

Phase 1 of this project collected data from 54 schools in the Region. The following trends were observed:

- The number of students being driven to school was considerably higher during the morning compared to the afternoon.
- The average number of students who walked alone during the afternoon is 8% higher than in the morning.
- The average proportion of students cycling alone to school is very low (1% during the morning commute and 2% during the afternoon commute). Less than 1% of students cycle with adults.
- The average number of students riding their bike alone and storing it on school grounds (on a bicycle rack) was higher in Mississauga compared to Brampton.

b. Family Travel Surveys

Family travel surveys are voluntary surveys used to collect information about the travel habits of the oldest or only child attending participating schools in Peel Region. The surveys collect information such as the proportion of students using each travel mode, travel time, frequency of active travel modes, and parents' perceptions about walking and cycling to school. The following trends were noted in available results from six schools surveyed in 2016 / 2017.

A significant proportion of parents at each school (ranging from 43% to 67%) feel that their children required more training to gain the skills needed for walking and cycling to and from school.

The perception of having safe cycling routes for children varies depending on the location of the school. A range of 21% - 54% of parents feel that bike routes are safe for their children to use. Negative perceptions of safety among parents are a significant barrier to increasing cycling as a travel mode for school children.

The belief that a car is the safest way for children to travel to and from school also varies widely depending on the location of the school with a range of 16% - 66% of parents making this claim.

Relatively high proportions of parents at all schools (50%-70%) believe that the pressures of daily life mean that they have to find the quickest way to get their children to school and believe that using a car is the quickest option.

When asked what changes were needed to increase active transportation "improved community safety" was included in the top 5 priorities for all schools.

Specific locations of concern were recorded for each school. Themes from these comments include concerns for safety due to high volumes and speeds of traffic, uncomfortable conditions at intersections, and due to driver behaviour such as illegal parking or not stopping at stop signs.

7. Bicycles and Transit

Rack and Roll data is collected to record usage of bicycle racks on MiWay buses. This data was requested from MiWay but was not available.

8. Bicycle Collisions

Patterns and potential safety issues that are revealed by bicycle collision data can provide a focus for infrastructure and programming to improve bicycle safety.

However, the number of collisions reported to Peel Region police is most likely an underestimate of the actual number of collisions that occur. Minor collisions are often not reported to police, particularly collisions that do not result in injury or property damage. "Near-misses" are also not recorded.

a. Collision Data 2010-2013

Collision data in Mississauga over a 4 year period from 2010 – 2013 shows a total of 473 collisions involving bicycles. Of these, 380 collisions occurred on Mississauga roads and 93 collisions on Peel Region roads. Ninety percent of all collisions in the 4 year period occurred at or near an intersection. Figure 11 shows the location of these collisions

Half of the collisions from 2010-2013 that occurred on Mississauga Roads resulted in injury. 3% were major injuries (requiring hospitalization) and 1% were fatal. Sixty percent of collisions on Peel Region roads resulted in non-fatal injuries. The majority of collisions (61% on Mississauga roads, and 66% on Peel Roads) occurred from May to September when there is typically more cycling activity.

Detailed analysis of the data from Mississauga roads shows the following:

- Most collisions occurred during the morning peak traffic period (7:00 am – 9:00 am) and the afternoon peak traffic period (5:00 pm – 7:00 pm).
- Sixty one percent of all collisions involved a cyclist riding on the sidewalk.
- Cyclists under the age of 25 made up the largest proportion of those involved in collisions at 47% of collisions.
- The most common manoeuvres resulting in a collision were cyclists going straight (91% of cyclist manoeuvres), and drivers turning left or right (49% of driver manoeuvres).
- 40% of drivers were "driving properly" while 32% failed to yield the right of way to cyclists, and 5% disobeyed traffic control.
- 49% of cyclists were "driving properly", 9% failed to yield the right of way to motor vehicles and 8% of cyclists disobeyed traffic control.

b. Potential Areas of Focus for Improved Safety

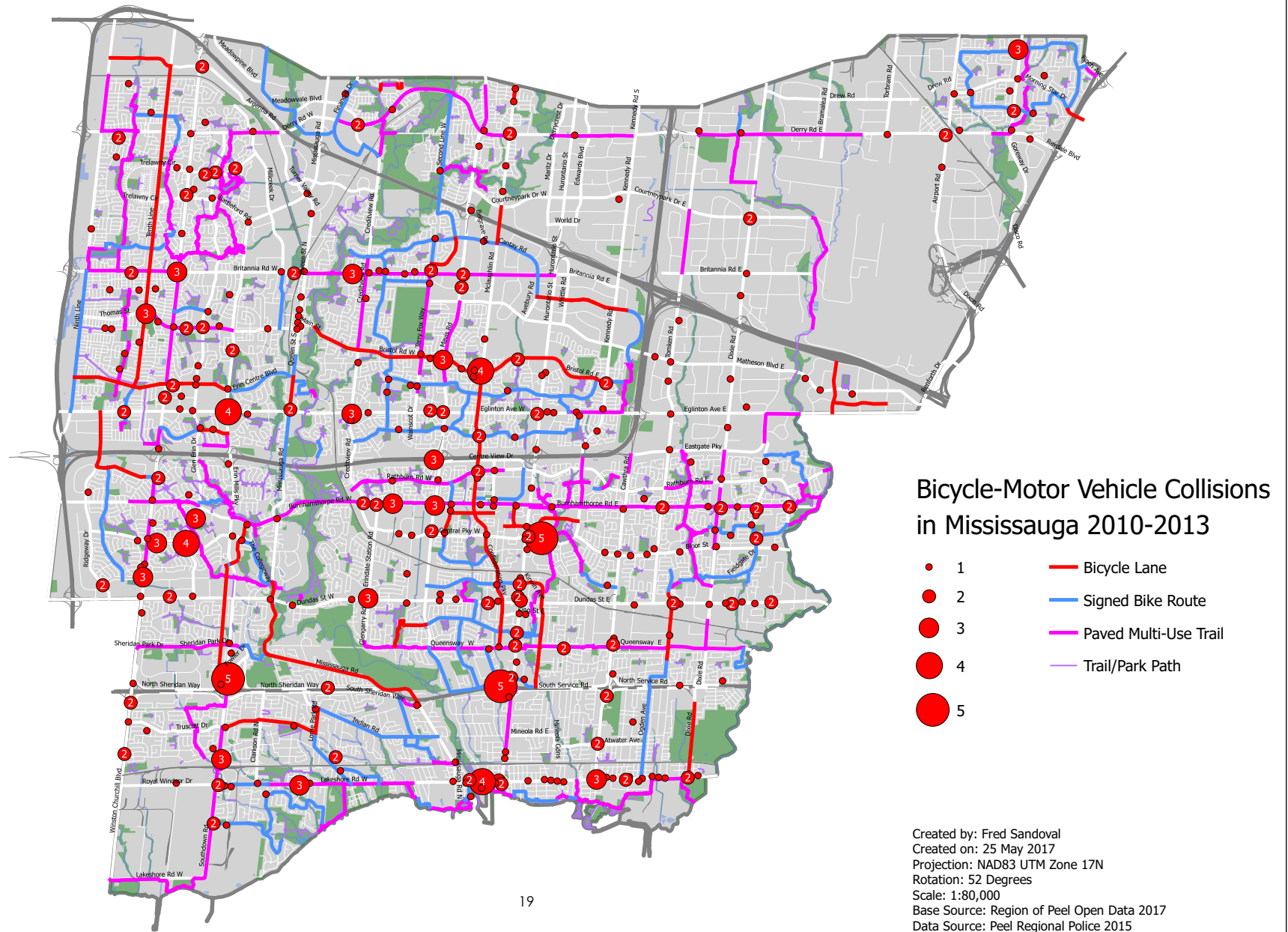
Intersections

The above data indicates that turning movements at intersections pose a key safety risk to cyclists. Improvements to intersection design to increase the visibility of cycling activity and limit motor vehicle turning speeds will help to improve safety and comfort for all road users.

Sidewalk Cycling

More than half of cyclists involved in collisions on Mississauga roads were riding on the sidewalk. This suggests a preference among many cyclists to be separated from motor

Figure 11: Location of Reported Bicycle Collisions 2010-2013



vehicle traffic, and provides evidence of the risk to safety that is introduced when cyclists ride on sidewalk facilities that are not designed for bicycle use. Bicycle facilities that provide separation from motor vehicle traffic, such as boulevard trails and protected bicycle lanes provide a more comfortable and safer alternative. In order to encourage cycling as a safe and viable mode of travel, increased enforcement to deter sidewalk cycling must be accompanied by the provision of comfortable cycling facilities.

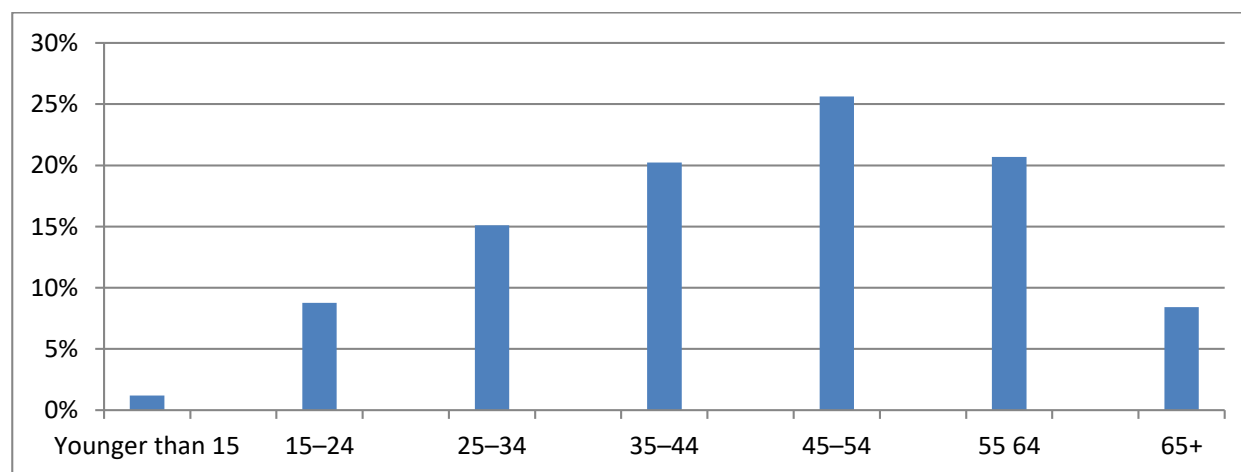
Facility Design and Education

Over a third of motorists involved in collisions with cyclists were reported as failing to yield the right of way. Although bicycles are permitted on all city and regional roadways, in many cases roadway designs do not communicate the presence of, or correct positioning and right of way for cyclists. Legible roadway design that includes clearly marked facilities for cyclists, accompanied by driver and cyclist education is important to improve safety and communicate the rights and responsibilities of all road users.

9. Mississauga Cycling Survey (2016)

From September to December 2016 an online cycling survey was conducted (and as an intercept survey at Celebration Square over two days in December 2016). This survey is being continued through 2017 as part of the Does Cycling Move You project. In 2016, 1,620 responses were collected, 62% of respondents identified as male and 38% as female. Figure 11 illustrates the age breakdown of participants.

Figure 11: Age of Cycling Survey Participants September – December 2016



Over half (54%) of respondents were frequent cyclists, 46% were occasional cyclists and 13% identified as people who never ride bicycles. Preliminary results from 2016 show the following:

Why don't Mississauga residents cycle more often?

1. Feeling unsafe:

- When asked: "Why don't you cycle more? (pick your top choice)", over half of cyclists chose options related to feeling uncomfortable cycling in traffic. "Feel unsafe on the road" was ranked highest among cyclists (30% chose this option) followed by "Lack of bike lanes / off-road trails "(28%).
- Just under a third of non-cyclists chose "Feel unsafe on the road" (28%) as their number one reason for not cycling, while another third (32%) said "I don't have a bicycle".
- 63% of cyclists and 24% of non-cyclists said that more protected cycling facilities would encourage them to cycle more often.

Figures 12 and 13 show responses among cyclists and non-cyclists when asked: how comfortable would they be cycling on six different types of facilities / roadways.

Figure 12: Cyclist perceptions of comfort in different cycling environments.

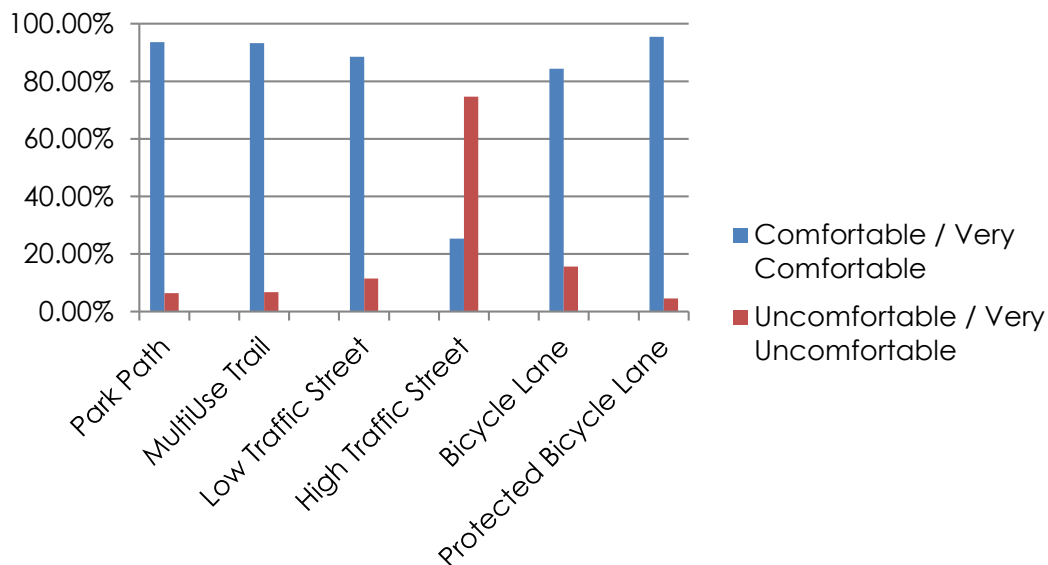
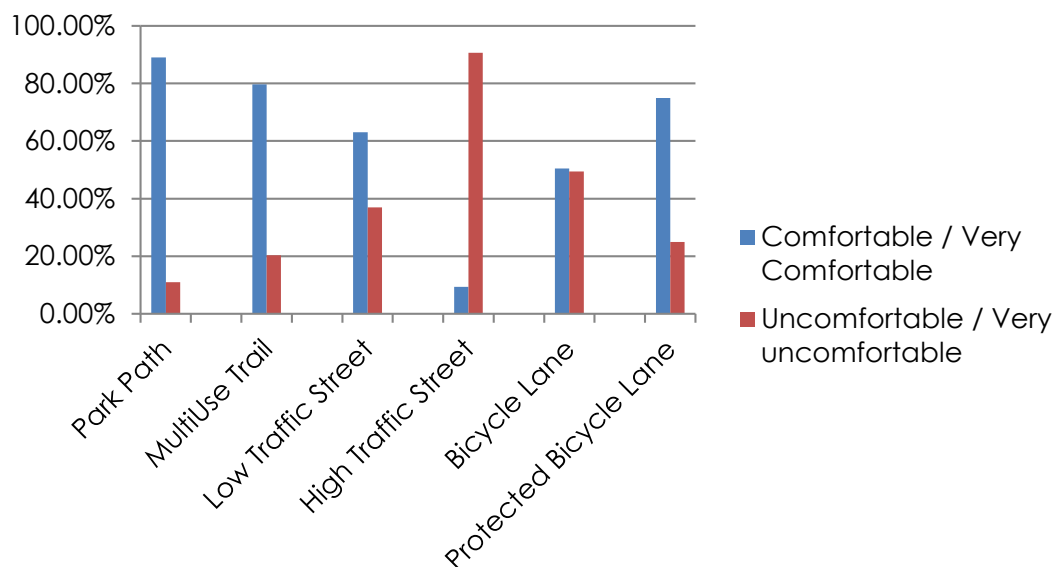


Figure 13: Non-cyclist perceptions of comfort in different cycling environments.

2. Distance and Weather:

Less than a quarter of cyclists (18%) said that distance was the number one reason for not cycling more often. And an equal proportion of cyclists said that weather was the primary reason for not cycling more often. As such, distance and weather together ranked third highest as the primary reason people do not cycle more often. Similarly, among non-cyclists, only 18% identified weather as the number one reason for not cycling.

3. Bicycle Ownership

A third of non-cyclists (32%) said that not owning a bicycle was the number one reason they didn't cycle while 60% of non-cyclists surveyed do not own a bicycle.

10. Peel Region GPS Cycling Study (2014)

This study, led by the Region of Peel and Waterloo University's Public Transportation Initiative, gathered information on utilitarian cycling in Peel Region. Data was gathered through a combination of an online survey and GPS units that were attached to participants bicycles. A total of 110 cyclists from Mississauga participated in the study. Highlights from the survey data is included below.

Demographic data:

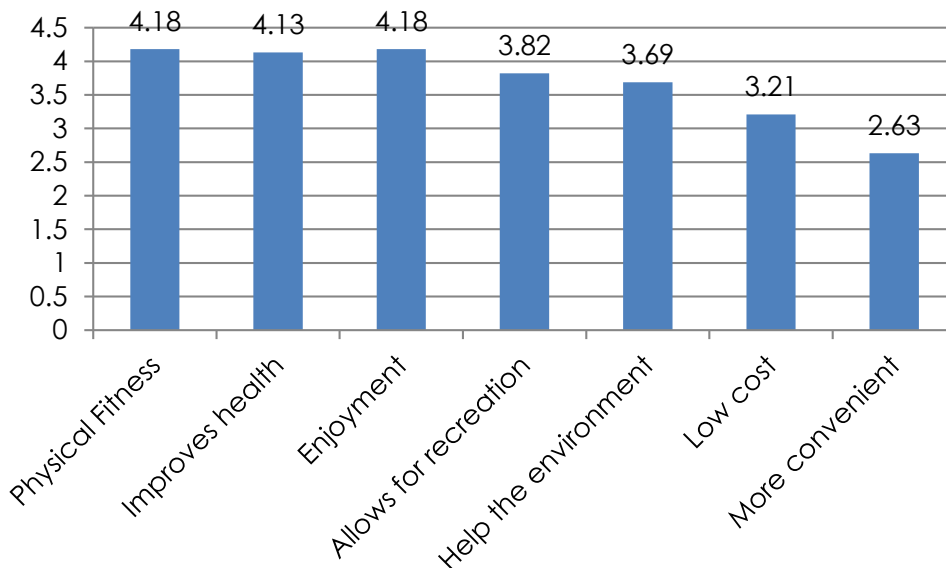
The majority of participants were male (77%) and income distribution, although diverse, was on average higher than the Regional average with 28% earning \$100,000 or more

annually. Over half of participants (59%) were from households with 2 automobiles. Thirty-eight percent of participants came from households where fewer cars were owned than there were licensed drivers.

Motivations for Cycling:

Survey questions asked cyclists to rank the importance of specific sources of cycling motivation from 1 (least important) to 5 (most important). From the 7 options provided, Mississauga cyclists were most motivated by “Enjoyment” and “Physical Fitness” and least motivated by “More convenient”. Figure 14 shows the motivations recorded by study participants.

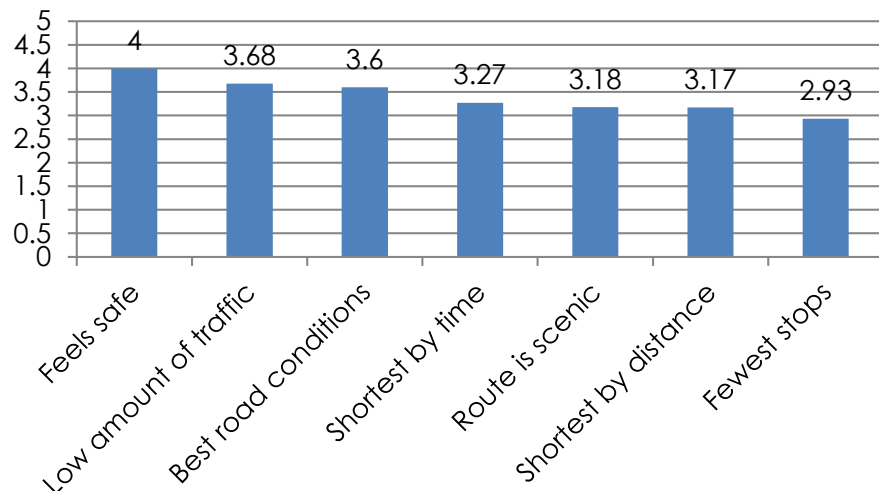
Figure 14: Motivations for cycling among Mississauga participants



Cycling Route Choice:

Cyclists were also asked which factors most influenced the route they chose to cycle. All cyclists, regardless of their location said that safety was the most important factor, particularly with respect to interactions with automobiles. Figure 15 illustrates average scores for the 7 factors used.

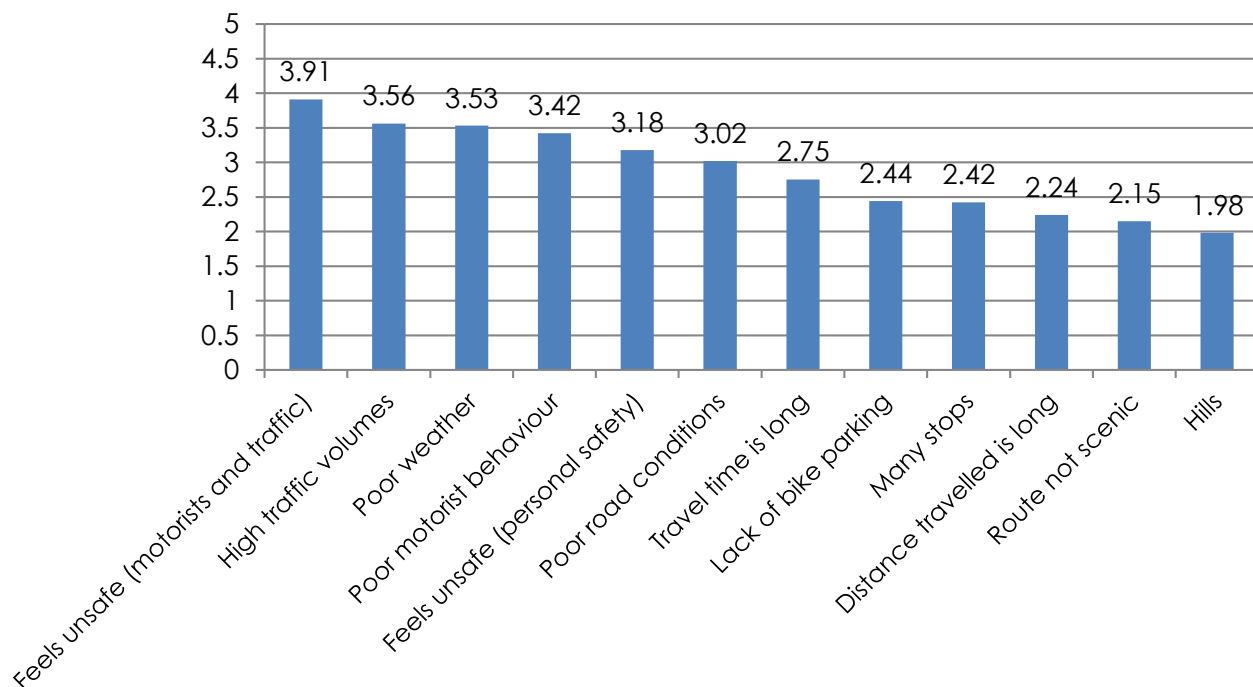
Figure 14: Factors influencing cycling route choice among Mississauga participants



Obstacles to Cycling:

Survey participants were asked to rate the importance of 12 factors that are deterrents for cycling. Once again, ratings were given from 1 (least important) to 5 (most important). Figure 15 shows that safety, particularly with respect to interactions with motorists was the most cited obstacle to cycling more often. Five of the top six responses were related to cyclists' perceptions of safety.

Figure 15: Obstacles to cycling among Mississauga participants

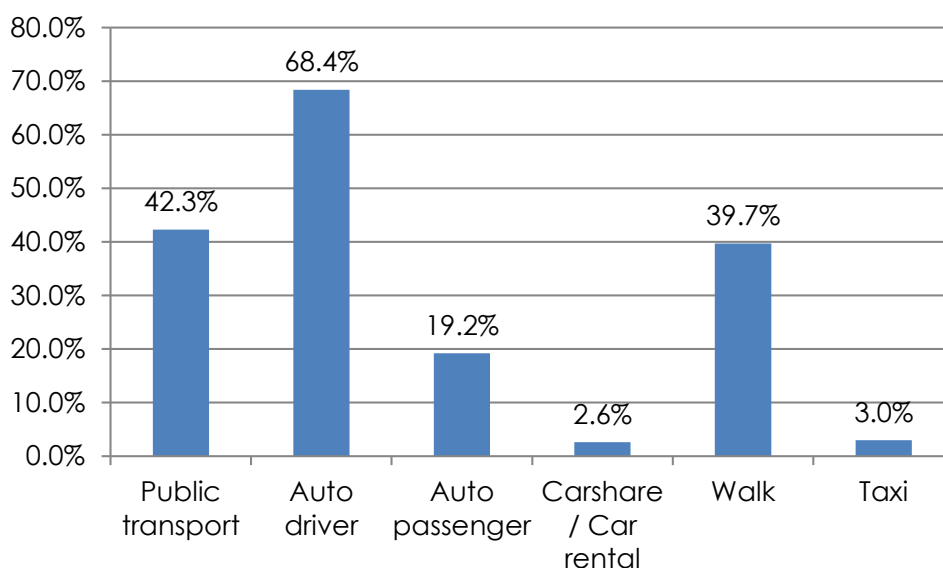


Respondents were asked to rate the severity of hazards from 1 (not a hazard) to 6 (an obstacle to cycling). The top 5 results for all Peel Region participants were:

1. Cars with distracted drivers (4.85)
2. Cars passing at high speeds (4.51)
3. Cars passing too close (4.48)
4. Not being seen by cars at night (4.24)
5. Cars making right turns in front of you (4.18)

All participants were asked which modes they use to complete cycling trips when they don't choose to cycle. Results are shown in Figure 16. Respondents were asked to indicate all responses that apply.

Figure 16: Alternative modes used when participants don't cycle



Cycling Trip Distances:

GPS tracking of participants cycling trips showed the average participant made 11.25 trips per week and the average cycling trip distance across the region for utilitarian cycling trips was 6.36 km. Among Mississauga participants, the average trip distance was slightly lower at 6.41 km.

An analysis of the paths taken by cyclists revealed that a significant portion of paths chosen were substantially longer than the shortest possible path. This was interpreted as either evidence of gaps in the cycling network, or evidence that the most direct path was less desirable than the alternatives.

Study Recommendations:

Study participants advocated strongly for increased infrastructure investment, particularly on-road cycling facilities at key locations. Locations most often suggested included Hurontario Street, Lakeshore Road, Mississauga Road and Queen Street.

The study recommends measures to improve cycling safety and comfort including traffic calming, increased physical separation of cyclists and automobiles, improved lighting and maintenance of on-road facilities.

11. Conclusions, Needs and Opportunities

The following conclusions, needs and opportunities have been drawn from the data summarized in this report.

- The cycling network in Mississauga is developing and although there are several continuous trails and routes, the network as a whole is not completed. Continued, strategic implementation of cycling routes to provide a minimum connected grid is needed to improve access and safety for all bicycle trips.
- The majority of cycling trips in Mississauga (84%) are 5km or less. Approximately 457,030 automobile trips in Mississauga are also 5 km or less. Over half of these short auto trips are home-based discretionary trips which can include shopping, visiting friends and family, running errands or other kind of trips. Providing comfortable cycling facilities that connect neighbourhoods to each other and to community destinations may help to increase the uptake of cycling. An increased focus on short discretionary trips for cycling promotional efforts may also be useful.
- Ridership data shows variable results depending on the method of data collection. There is a need to improve ridership data collection with a more robust and coordinated cycling count program that is designed to account for all types of cycling trips and the unique variability of cycling volumes due to time of day, time of year and daily weather events. Improved baseline data is needed, in addition to ongoing measurement of before and after effects of cycling facility implementation and upgrades. Coordination between Regional counting programs and inter-divisional coordination is also needed.
- Lakeshore Road is an important corridor for cycling. Available data consistently shows Lakeshore Road as a location where cycling activity is relatively high and it is an important cycling route between adjacent municipalities. Collision data from 2010-2013 shows clusters of collisions along the Lakeshore corridor in locations with and without cycling facilities. There is a need to improve safety and access for cyclists along this corridor.
- A lack of comfortable, connected cycling facilities is a deterrent to bicycle commuting among Smart Commute member employees. A good proportion of

corporate centre employees live within a reasonable cycling distance from work, and several employees express an interest in being able to cycle to work, however there are significant obstacles to cycling such as busy arterial roads, major highway interchanges and in some locations a lack of bicycle parking and shower facilities. There is an opportunity to prioritize comfortable cycling connections between neighbourhoods and corporate centres to enable bicycle commuting.

- A very low percentage of elementary and middle school students cycle to school. Negative perceptions of safety among parents are a significant barrier to increasing cycling as a travel mode for school children. Providing cycling facilities in school areas that include traffic calming effects and protected crossings will encourage more cycling among students. Bicycle safety training for both students and parents is needed to address the perception among parents that students need more training.
- Turning movements at intersections pose a key safety risk to cyclists. Improvements to intersection design to increase the visibility of cycling activity and limit motor vehicle turning speeds will help to improve safety and comfort for all road users.
- More than half of cyclists involved in collisions on Mississauga roads were riding on the sidewalk. This suggests a preference among many cyclists to be separated from motor vehicle traffic, and provides evidence of the risk to safety that is introduced when cyclists ride on sidewalk facilities that are not designed for bicycle use. Bicycle facilities that provide separation from motor vehicle traffic, such as boulevard trails and protected bicycle lanes are needed in certain locations to provide a more comfortable and safer alternative to sidewalk riding. Increased enforcement to deter sidewalk cycling should be accompanied by the provision of comfortable cycling facilities.
- Over a third of motorists involved in collisions with cyclists were reported as failing to yield the right of way. Although bicycles are permitted on all city and regional roadways, in many cases conventional roadway designs do not communicate the presence of, or correct positioning and right of way for cyclists. Legible roadway design that includes clearly marked facilities for cyclists, accompanied by driver and cyclist education is needed to improve safety and communicate the rights and responsibilities of all road users.
- Survey data from Peel Region and the City of Mississauga shows that feeling uncomfortable or unsafe is a significant deterrent for cyclists and non-cyclists to

ride bicycles. There is a strong preference among both groups to improve comfort and safety for cyclists through separated or protected cycling facilities. There is a need to consider cyclists' tolerance for traffic stress when planning a cycling network, to better determine the efficacy of planning and design recommendations to meet cycling master plan goals.