2021 TRAVELLER SAFETY REPORT

A Focus on Regional Road Collision Statistics Based on 2020 and Preceding Years

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York Region

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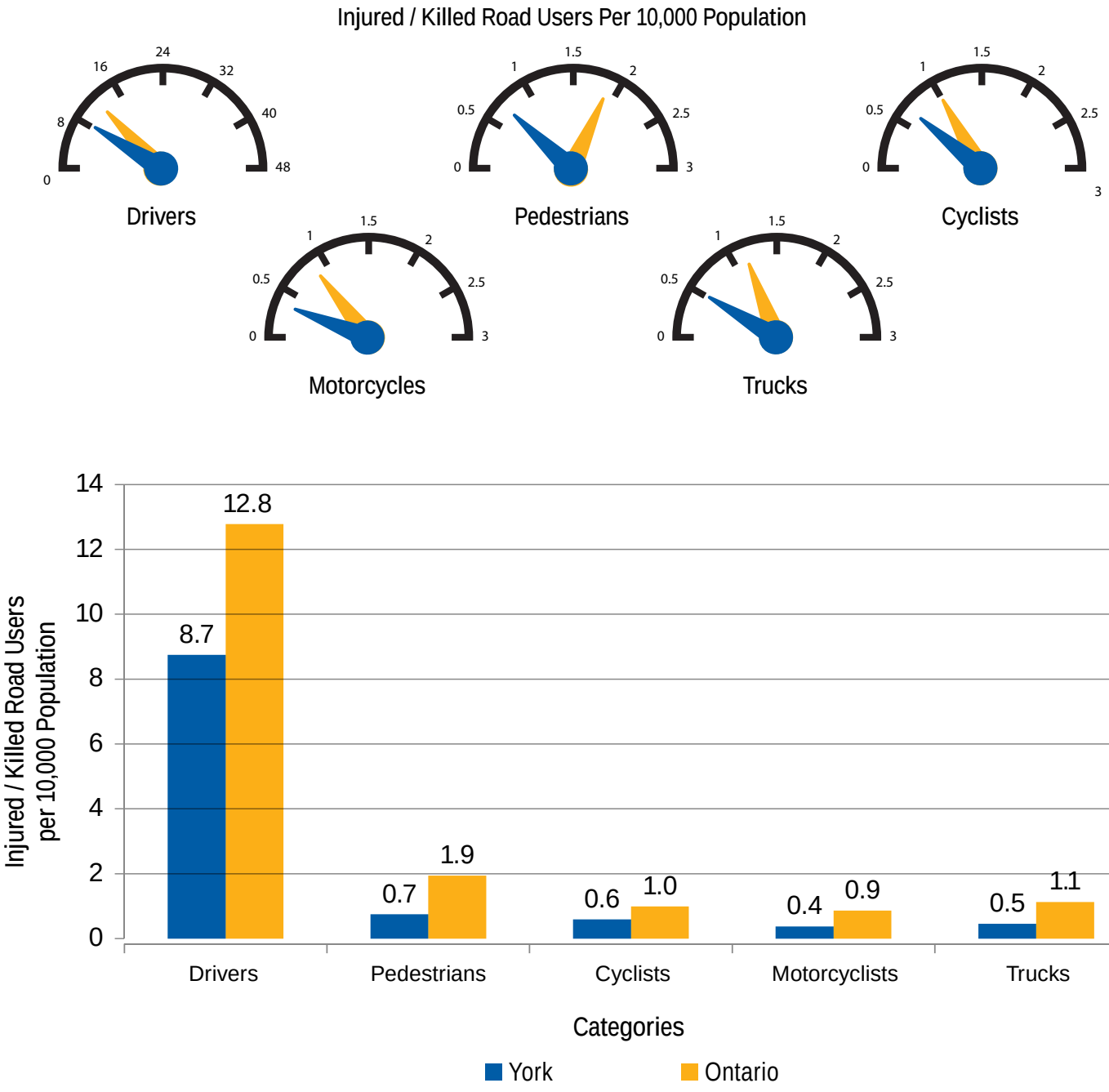
Acronyms and Abbreviations

AADT: Average Annual Daily Traffic
ASE: Automated Speed Enforcement
CAA: Canadian Automobile Association
MTO: Ministry of Transportation Ontario
MVA: Motor Vehicle Accident
PCS: Permanent Counting Station
PDO: Property Damage Only
PXO: Pedestrian Crossover
SMV: Single Motor Vehicle
TTS: Transportation Tomorrow Survey
YR: York Region
YRP: York Regional Police
YRT: York Region Transit

Executive Summary

2020 YORK REGION VS. ONTARIO PROVINCIAL AVERAGE INJURY/FATALITY RATES



*York Region collisions on Regional roads reported by York Regional Police
*The population data is based on census data from Statistics Canada
*Ontario collision data is from MTO Ontario Road Safety Annual Reports

York Regional roads are planned, designed, constructed and operated to Ontario provincial guidelines. Compared to the provincial average, in 2020, York Regional roads have lower injury/fatality rates for all major types of road users including motor vehicle drivers, pedestrians, cyclists, motorcyclists and truck drivers. This can possibly be attributed to improved road engineering and operations, stricter traffic legislation and enforcement, and systematic road safety initiatives in the Region.

Motorists ↓ 32% (2020 Collision Rate Compared to 2016-2019)

Travellers are involved in 12% less collisions and 15% less injuries each year, even with a 2% increase annually in trips made by all travellers in the Region. The motor vehicle collision rate (annual number of motor vehicle collisions over annual motor vehicle trips) in 2020 is 32% lower than the 2016-2019 average. Public health restrictions related to the COVID-19 pandemic has resulted in a reduction in the 2020 annual traffic volume on Regional roads by 20-50%. The reduction of traffic volume has contributed to the significant decrease of the collision rate.

88% of all motor vehicle collisions are caused by improper driving behaviours. As per a CAA survey, 95% of respondents are seeing unsafe driving behaviours.

It is well-documented that higher speeds lead to higher injury severity in a collision. Fatal collision statistics in 2020 show more than 30% of all fatal collisions were related to speeding. Enforcement statistics over the past five years also identify speeding as the top traffic violation in the Region, representing more than 60% of all traffic offences.

Pedestrians ↓ 42%

Cyclists ↓ 35%

While motor vehicles are the most common mode of travel in the Region, the number of people choosing active transportation modes, such as walking and cycling, is increasing at a fast pace. During the COVID-19 pandemic, rates increased further as citizens turned to recreation and outdoor activities. The rates of pedestrian collisions (annual number of pedestrian collisions divided by annual walk trips) and cyclist collisions (annual number of cyclist collisions divided by annual bike trips) in 2020 are respectively 42% and 35% lower than the average of 2016-2019. Improving pedestrian and cyclist safety continues to be a priority as the percentage of collisions resulting in injuries continues to be above 80%.

Motorcyclists ↓ 2%

Motorcyclists have doubled during the last 10 years, while the number of motorcycle collisions is generally very low and steady. The rate of motorcycle collisions (annual number of motorcycle collisions over annual motorcycle trips) in 2020 was 2% lower than the 2016-2019 average. Motorcycle collisions are highly seasonal (mostly occurring in the warmer months of the year), distributed evenly among weekdays and weekends, and relatively high in some night hours. Motorcyclists have a high risk of losing control leading to SMV collisions. As motorcyclists do not have the same level of protection as the drivers of other types of vehicles, they have a high injury rate if involved in a collision.

Trucks ↓ 11%

Truck collision rate in 2020 was 11% lower than the average of 2016-2019. Fatality rates remain at low levels and injury collision rates remain steady. More than half of truck traffic and collisions occur in the City of Vaughan where trucking distribution centres are predominant. Major trucking corridors like Highway 7, Highway 27, Weston Road and Keele Street provide key connections for goods movement to provincial highways (Highways 400, 407 and 427).

Transit ↓ 31%

Total collisions involving all public and private transit vehicles combined increased marginally by approximately 3% annually, while transit operations in the Region, including the number of service hours and kilometres travelled, has increased over the past decade. There was a significant reduction in transit ridership in 2020 due to the Public Health restrictions related to the COVID-19 pandemic.

However, the collision rate of all public transit vehicles on Regional and local municipal roads in 2020 was 31% lower than the 2016-2020 average, and the collision rate of York Region Transit (YRT) vehicles exclusively was 28% lower.

Buses are slower, longer and require more space. A pattern of motorists failing to provide buses ample space has led to a spike in the number of sideswipe collisions over the last few years. However, sideswipe collisions involving private and public buses decreased by 30% in 2020 when compared to the previous four years.

Introduction

York Region is home to 1.2 million people in nine local cities and towns, bounded by Steeles Avenue in the south, Highway 50 in the west, York Durham Line in the east and Lake Simcoe in the north. The Region continues to experience growth and is expected to reach 1.5 million people by 2031.

The Regional road network consists of approximately 4,400 lane-kilometres of urban and rural arterial roads, 2,200 intersections and approximately 890 traffic signals that help residents and visitors get to where they live, work and play. Regional roads carry more than six billion vehicle-kilometres of travel annually and more than 2.6 million vehicle trips daily.

York Region's Corridor Control and Safety division maintains and manages York Region's traffic data system. The database contains information on all motor vehicle collisions that occurred on York Regional roads, and result in property damage of $2,000 or greater, as well as any collisions that resulted in a minor or serious injury or fatality. Collision information is collected from the provincial Motor Vehicle Accident (MVA) Report Form, completed by York Regional Police (YRP). Copies of all MVA reports are provided to the Corridor Control and Safety division for record and to conduct further analyses. Currently, York Region's traffic data system does not include collisions that occur on local municipal roadways and provincial highways as each local municipality and the province manages their own data.

First published in 2014, the 2021 Annual Collision Statistics Report is the 8th edition containing collision statistics on York Regional roads, based on causes, temporal information, high collision locations, injury severity and modes of travel to identify trends and support decision-making. This year's report primarily includes data collected for 2016 to 2020 and updated data for comparing with previous iterations. The daily trip volumes of modes of travel such as motor vehicles, walking and cycling shown throughout the report are sourced and forecasted from the most recent Transportation Tomorrow Survey (TTS), 2016.

The 2021 Annual Collision Statistics Report provides a detailed breakdown of the traveller experience on Regional roads, using collision statistics and other data such as traffic volume, weather and population. Staff analyzed collision data using motor vehicle collision reports from YRP to identify issues for specific locations as well as trends that may indicate larger issues. The report also supports coordinated law enforcement and helps in the development of programs to improve road safety, including public education and awareness campaigns for all travellers in York Region.

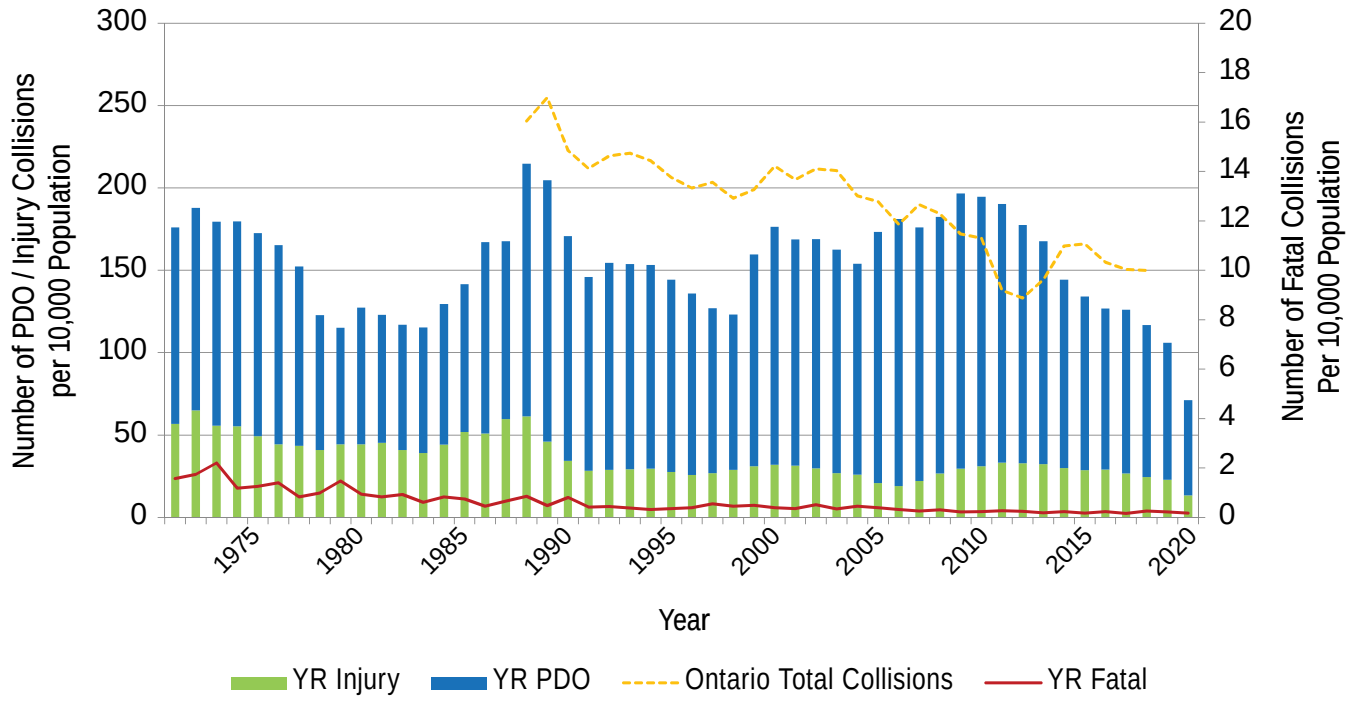
The Annual Collision Statistics Report is part of a proactive approach to making Regional roads safer for all travellers, and now the Region's own response to various trends. The response includes the Region's current or upcoming road safety initiatives in road engineering, intersection operations, pavement/signage improvements, bus rapidway construction, automated enforcement, and other speed management initiatives.

Overview

As a result of stricter legislation, advancements in technologies, and the success of road safety initiatives, injury and fatal collision rates of all road users have decreased significantly over the past 50 years as shown in the figure below.

York Region has lower collision rates than those of Ontario for most years. Both injury and fatal collision rates in York Region have long-term decreasing trends, and total collision rates have dropped by 46% from 197 per 10,000 population in 2010 to 107 per 10,000 population in 2019. As a result of the COVID-19 pandemic, 2020 was an unprecedented year. Between March to December 2020, traffic volumes decreased between 20% and 50% in comparison to 2019. As a result of reduced exposure, less collisions occurred in 2020, reducing the overall collision rate.

COLLISIONS ACROSS YORK REGION, 1971-2020



*York Region collisions on Regional and local municipal roads reported by York Regional Police
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*Ontario collision numbers is from MTO Ontario Road Safety Annual Reports

APPROXIMATELY 88% OF COLLISIONS ARE A RESULT OF IMPROPER DRIVING.

Overall, collisions at a 10-year low

Collisions are a result of numerous factors, often unique to specific events. A review of collisions over the past 10 years shows that motor vehicle collisions are decreasing despite more vehicles travelling on Regional roads than ever before. In 2020, there was a 10-year low in total collisions, with just over 4,000 collisions occurring on Regional roads as a result of COVID-19 Public Health restrictions. Most collisions (88%) were a direct result of improper driving.

An overview of collision statistics on Regional roads between the years 2018 and 2020 shows that collisions continue to occur most frequently on Fridays, during the winter months and the evening rush hour (5 p.m. to 6 p.m.). The most common collisions are rear-end collisions at signalized intersections, as a result of motorists following too close. Consistent with past years, the majority of high collision intersections are situated on high volume roads in urban areas. The table on the next page compares collision data for the years 2018, 2019 and 2020.

Overall, there has been a reduction of collision experience, which is reflected in the table on the next page. The intersection of Islington Road and Rutherford Road has been identified as the highest collision location. It replaces the intersection of Weston Road and Highway 7, where the rapidway was recently completed. ASE has been used in the vicinity and red-light cameras have been installed. Staff have identified additional improvements to be implemented at this intersection in 2021-2022 which include pedestrian crossovers at the channelized right-turn lanes.

ANNUAL COMPARISON OF COLLISIONS, 2018-2020

Statistics	2018	2019	2020	Change (2019-2020)
Number of Collisions	7,510	7,038	4,538	-36%
Number of Fatal Collisions	17	19	15	-21%
Number of Injury Collisions	1,936	1,876	1,085	-42%
Number of Collisions Involving Pedestrians	159	140	100	-29%
Percentage of Collisions Involving Pedestrians Resulted in Injuries or Fatalities	96%	94%	91%	-3%
Number of Collisions Involving Cyclists	94	110	81	-26%
Percentage of Collisions Involving Cyclists Resulted in Injuries or Fatalities	78%	86%	88%	2%
Collision Rate Per 100,000 Population	635	571	378	-34%
Fatal Collision Rate Per 100,000 Population	1.4	1.5	1.2	-20%
Day with Highest Number of Collisions	Friday	Friday	Friday	-
Month with Highest Number of Collisions	January	November	February	-
Hour with the Highest Number of Collisions	5 to 6 p.m.	5 to 6 p.m.	5 to 6 p.m.	-
Most Common Collision Type	Rear-end	Rear-end	Rear-end	-

ANNUAL COMPARISON OF COLLISIONS, 2018-2020 (CONTINUED)

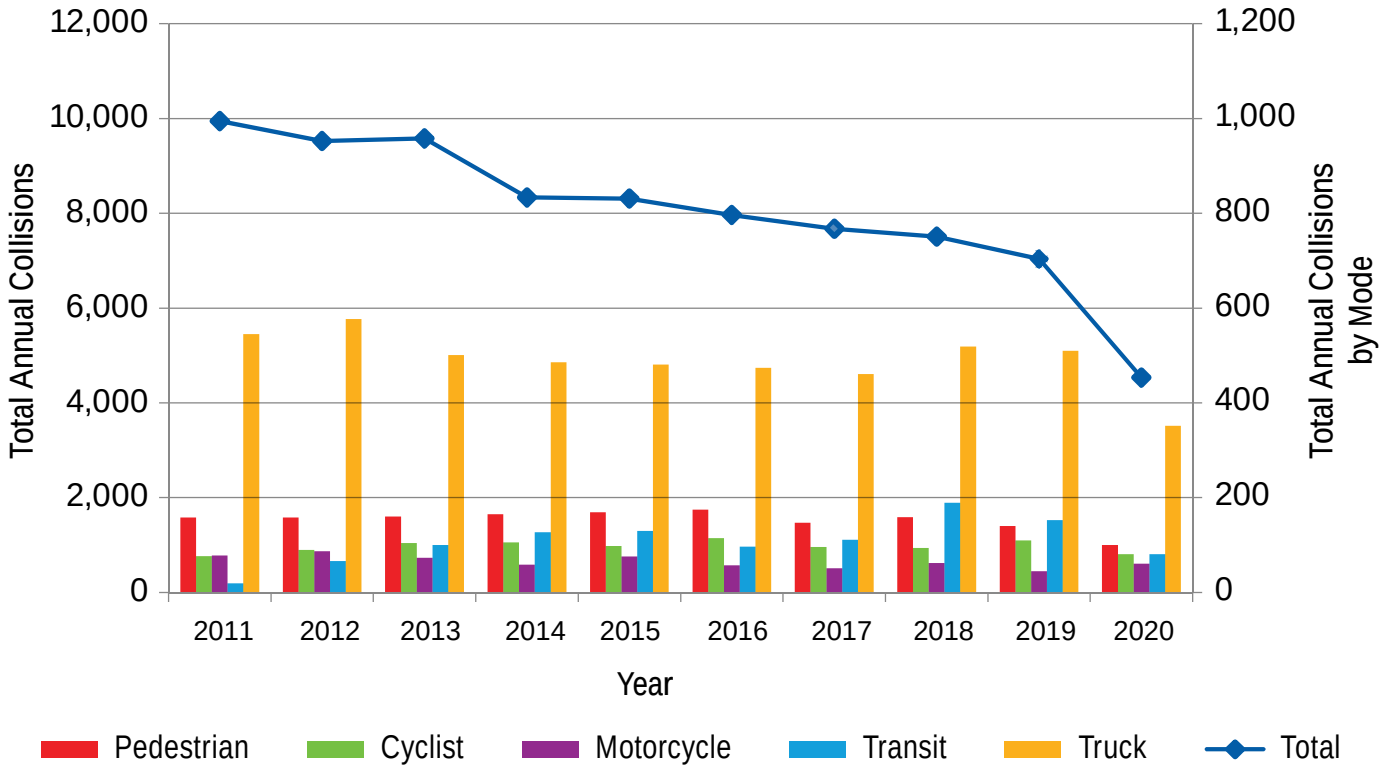
Statistics	2018	2019	2020	Change (2019-2020)
Most Frequently Recorded Improper Driving Action	Following Too Close	Following Too Close	Following Too Close	-
Location with the Highest Number of Collisions	Highway 7 and Weston Road	HIghway 7 and Weston Road	Islington Avenue and Rutherford Road	-
Mid-block with the Highest Number of Collisions	Highway 7 between Huntington Road and Highway 427 - Highway 7 Ramp	Highway 7 between Huntington Road and Highway 427 - Highway 7 Ramp	Highway 7 between Huntington Road and Highway 427 - Highway 7 Ramp	-
Percentage of Collisions Occurring at Intersections	69.40%	68.24%	63.55%	-5%
Percentage of Collisions Occurring During Winter Driving (Snow/ Ice Road Surface) Conditions	6.80%	9.80%	8.15%	-2%
Number of Daily Vehicle Trips	2,602,512	2,650,351	2,155,155	-19%
Number of Daily Walk Trips	99,898	102,045	104,192	2%
Number of Daily Cycle Trips	11,359	11,770	12,181	3%
Injury Collision Rate per Million Vehicle Trips	2.42	2.31	1.65	-29%
Injury Collision Rate per Million Walk Trips	4.79	4.06	2.8	-31%
Injury Collision Rate per Million Cycle Trips	20.05	21.82	15.01	-31%

Notes:
York Region collisions on Regional roads reported by York Regional Police
The population data is based on census data from Statistics Canada
The number of trips for 2018 and 2019 is based on TTS studies
The number of trips for 2020 is estimated using TTS studies and Region's PCS data

In 2020, there was a 10-year low in the number of collisions on Regional roads

There was a significant decrease in collisions in 2020, partially due to the public health restrictions related to the COVID-19 pandemic and a reduction in traffic. The number of cyclist collisions have a long-term increasing trend as active transportation is becoming more popular in York Region. However, as the growth in trips is outpacing growth in collisions, the rate of collisions is actually decreasing. Pedestrians and cyclists are most vulnerable to injuries, with 94% of pedestrians and 84% of cyclists sustaining injuries during collisions. Most collisions occur when vehicles are making turns at signalized intersections.

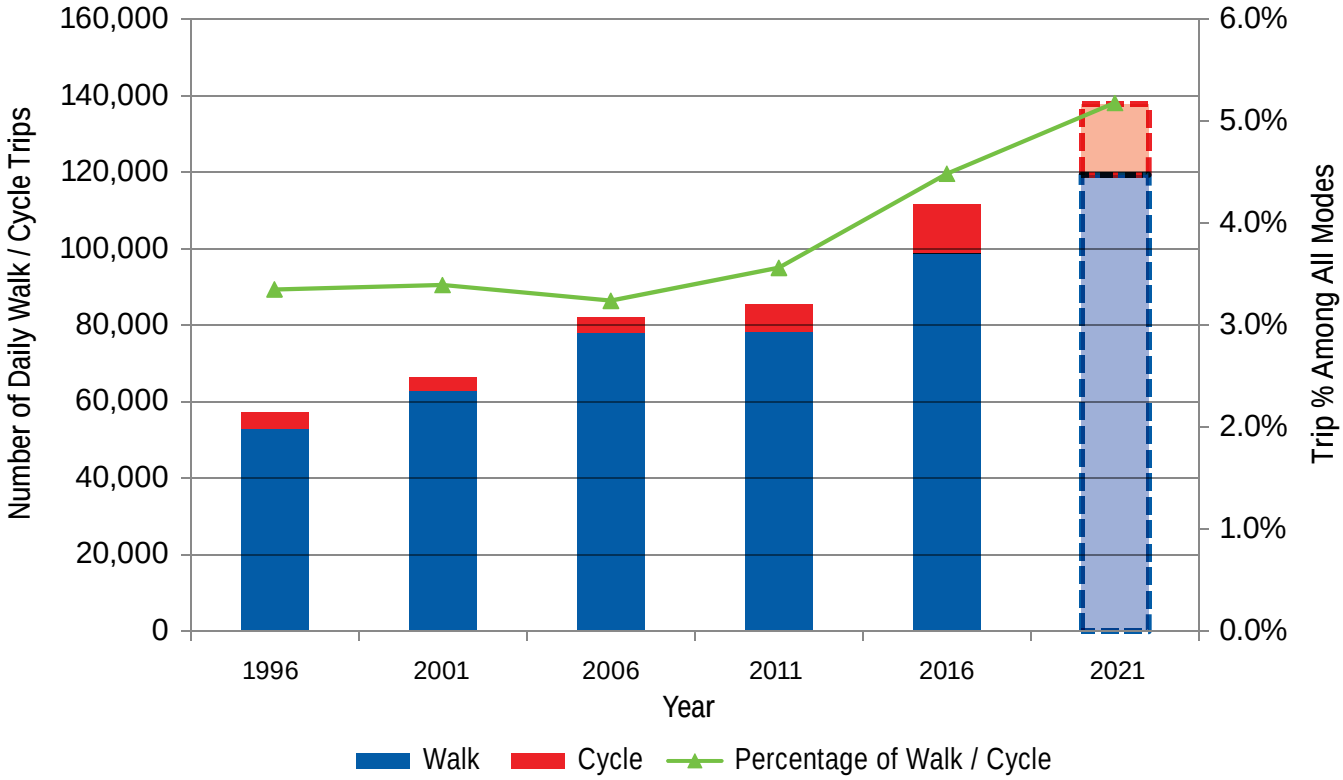
ANNUAL COLLISIONS BY ROAD USER MODES, 2011-2020



*York Region collisions on Regional roads reported by York Regional Police

A review of collision statistics over the last decade shows overall collisions on Regional roads continue to decrease to a 10-year low with just over 4,000 collisions in 2020. Except for motorcycle collisions, all modes of road users experienced less collisions, partially due to the Public Health restrictions related to the COVID-19 pandemic, resulting in a reduction in traffic exposure. Collisions involving trucks are in general a decreasing trend. Collisions involving transit vehicles have a long-term uptrend over the last 10 years, while York Region Transit's service hours have also increased by 12% by 2019, including the introduction of six Viva rapidways into operation. GO Transit has also significantly increased operations in the Region, transitioning from hourly to 15-minute two-way service on several key corridors prior to the COVID-19 pandemic.

YORK REGION DAILY WALK/CYCLE TRIPS, 1996-2021



*The number of trips is based on TTS studies
* 2021 daily walk/cycle trip estimates are adjusted with the impact of COVID-19 lockdown

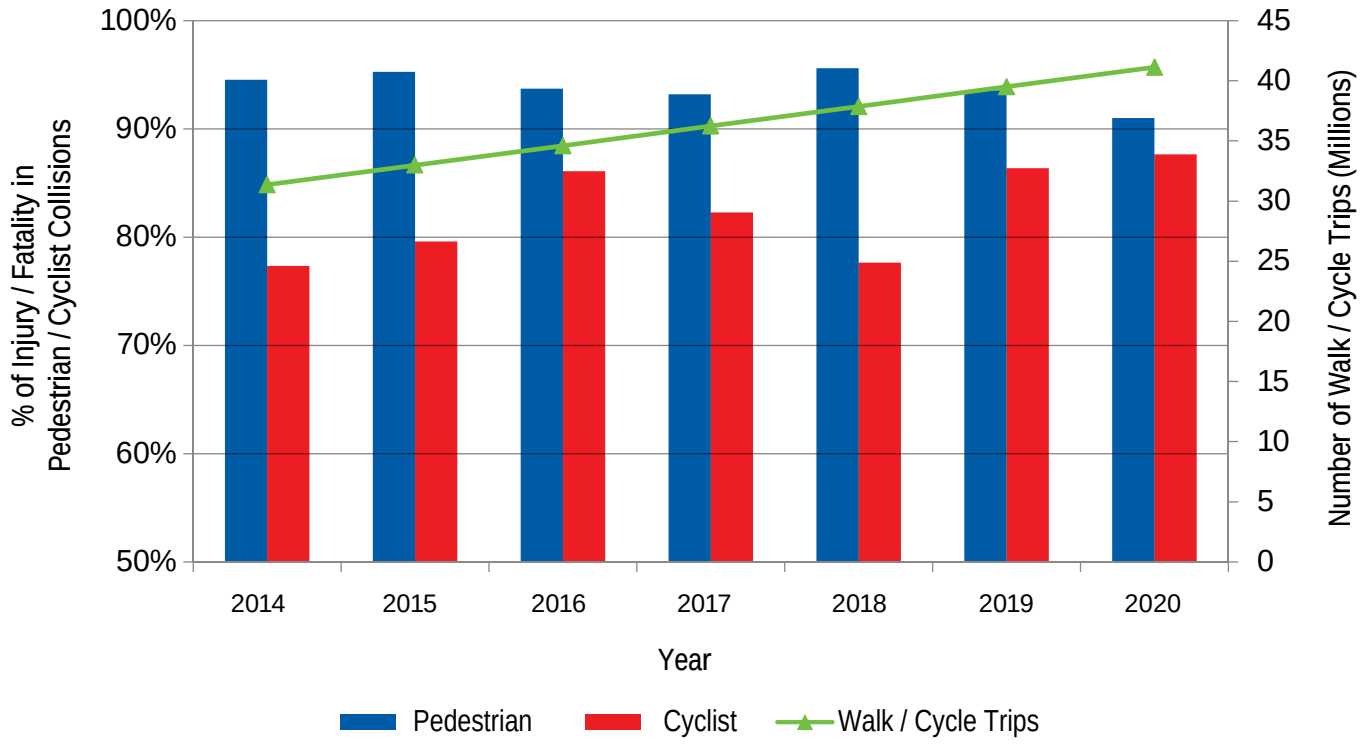
New measures to help protect vulnerable road users

Based on the TTS studies, more and more people have chosen to walk or bike over the last 20 years. From 1996 to 2016, the total number of daily trips on foot or bicycles has increased 5% annually. In comparison, driving only has increased by 2%. It is estimated that daily walk and cycle trips within or crossing York Region boundaries will be close to 140,000 by 2022.

The 2021 MTO Road Safety Survey indicates that COVID-19 has impacted the frequency of walking and cycling trips. More than one-third of Ontario residents say they are walking outdoors more and nearly one-quarter (22%) say they are riding a bicycle more often as their leisure/recreational activities during the COVID-19 pandemic.

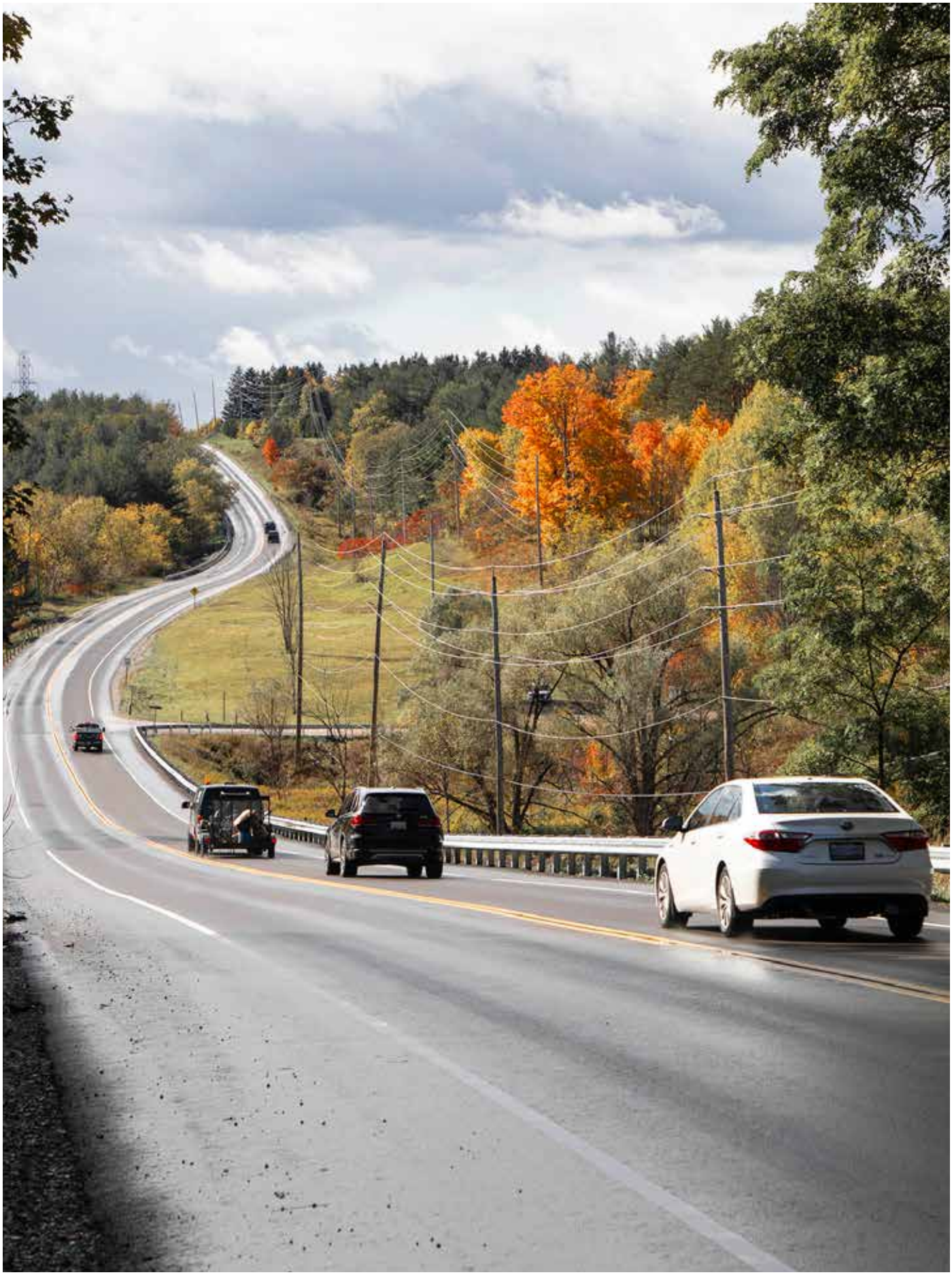
While 24% of vehicle-only collisions resulted in injuries or fatalities, more than 80% of pedestrian and cycling collisions result in injuries or death. Pedestrians and cyclists are the most vulnerable travellers on the Regional transportation system and lack protection compared to travellers in enclosed vehicles as shown in the chart on the next page. The increase in pedestrian and cycling trips across the Region and high rates of injuries sustained make these modes of travel a key area of focus for safety improvements.

PEDESTRIAN AND CYCLIST INJURY/FATALITY RATES



*The number of trips is based on TTS studies

To protect vulnerable road users, York Region has implemented pedestrian and cycling safety measures at select signalized intersections. The Region is measuring success to support future enhancements, while building strong partnerships with its road safety partners. In addition to existing safety programs, including red light cameras and speedWATCH, speed reduction in school zones, the Region launched a two-year automated speed enforcement (ASE) pilot with the goal to increase safety in school areas and help change driver behaviour.



Motorists ↓ 32%

Driving is the most common mode of travel on Regional roads accounting for nearly 87% of total trips. Based on an average of the last three years, there are more than 700 million motor vehicle trips made annually with more than 6,000 annual collisions involving motor vehicles. The motor vehicle collision rate (annual number of motor vehicle collisions over annual motor vehicle trips) in 2020 is 32% lower than the average of 2016-2019. Public Health restrictions during COVID-19 pandemic resulted in a reduction in the 2020 annual traffic volume on Regional roads by 20-50%. The reduction of traffic volume has contributed to a significant decrease in the annual collision rate.

Motorists are involved in 12% less collisions and 15% less injuries each year, even with a 2% increase annually in population and trips made by all travellers in the Region with the exception of 2020 as a result of COVID-19. This is encouraging and can be attributed to advancement in car technologies (airbags, antilock brakes, electronic stability control, etc.), road safety programs, and legislation and enforcement.

THE COVID-19 PANDEMIC RESULTED IN A REDUCTION IN ANNUAL TRAFFIC VOLUME ON REGIONAL ROADS OF 20 - 50% IN 2020. THE NUMBER OF COLLISIONS DROPPED BY 36% COMPARED TO 2019.

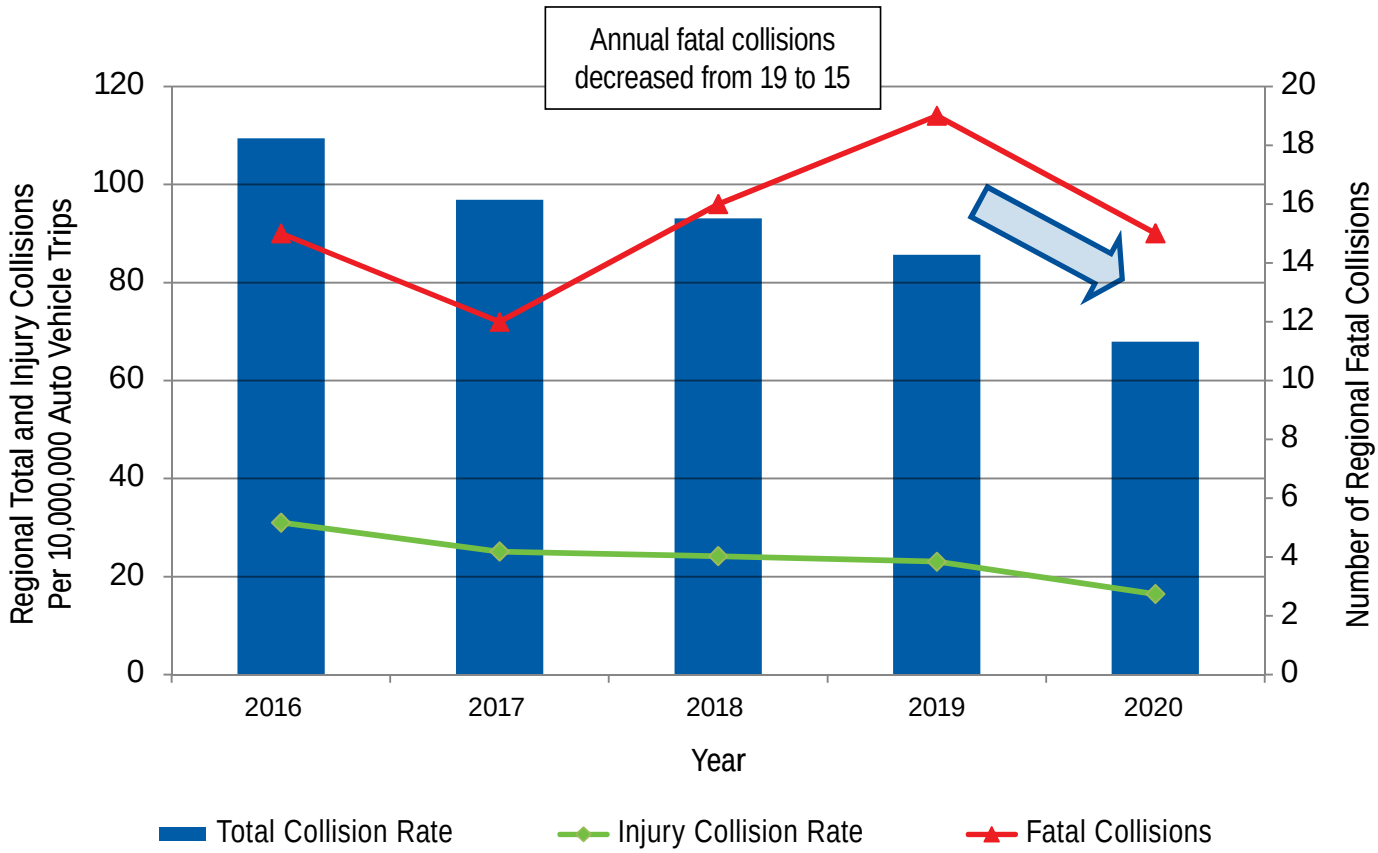
Key trends observed include:

- The COVID-19 pandemic resulted in a reduction in annual traffic volume on Regional roads of 20-50%
- The reduction of traffic volume contributed to a 32% decrease in the annual collision rate
- Travellers are involved in 12% less collisions each year while fatal collisions decreased from 19 to 15 in 2020
- More than 30% of fatal collisions are speed-related
- Young drivers are more likely than other age groups to be at-fault in fatal collisions.
- Snowy and rainy weather increase collision risk
- Majority of collisions occur at intersections (67%) as a result of a high occurrence of conflict points with vehicles travelling in different directions and making turns
- Improper driving behaviours result in 88% of collisions
- Following too close is the top driver action (30%) in the cause of a collision
- Inattentive behaviour while driving is an increasing cause of collisions (18%)
- Top impact types are rear-end (low severity, 38%) followed by angle and turning movement collisions (high severity, 31%)

The Region continues to put measures in place to address safety concerns including:

- Pavement rehabilitation programs such as microsurfacing (adhesive mixture containing small stones applied to roads) not only extends the life of the road but also improves traction leading to a reduction in rear-end collisions
- Implementing fully protected left turns which reduces conflicts at high volume urban intersections
- Creating buffer zones between left-turn and through lanes for improved visibility
- Enhanced traffic control measures to traffic signals or all-way stop which significantly reduces the frequency of angle collisions

MOTOR VEHICLE ACCIDENT RATES, 2016-2020



*The collision data is from YRP MVA reports
*The number of trips is based on TTS studies

Fatal collisions are random events that fluctuate annually with approximately 15 fatal collisions on average per year. It is well-documented higher speeds lead to higher injury severity in a collision. Fatal collision statistics in 2020 show more than 30% of all fatal collisions were related to speeding. Enforcement statistics over the past five years also identify speeding as the top traffic violation in the Region, representing more than 60% of all traffic offences.

A slower rate of speed and leaving space between vehicles creates more time for motorists to react. Large vehicles like trucks and buses need extra room to stop, turn and have many blind spots. By driving safely, keeping distance and taking extra precautions around large trucks and buses, passenger vehicle drivers can significantly reduce the risk of being involved in a serious collision.

Collisions by Month, Day and Time

A greater understanding of when collisions are occurring

Collision statistics by month indicate a seasonal trend. There are a higher number of collisions occurring during the fall months while spring has the least number of collision occurrences.

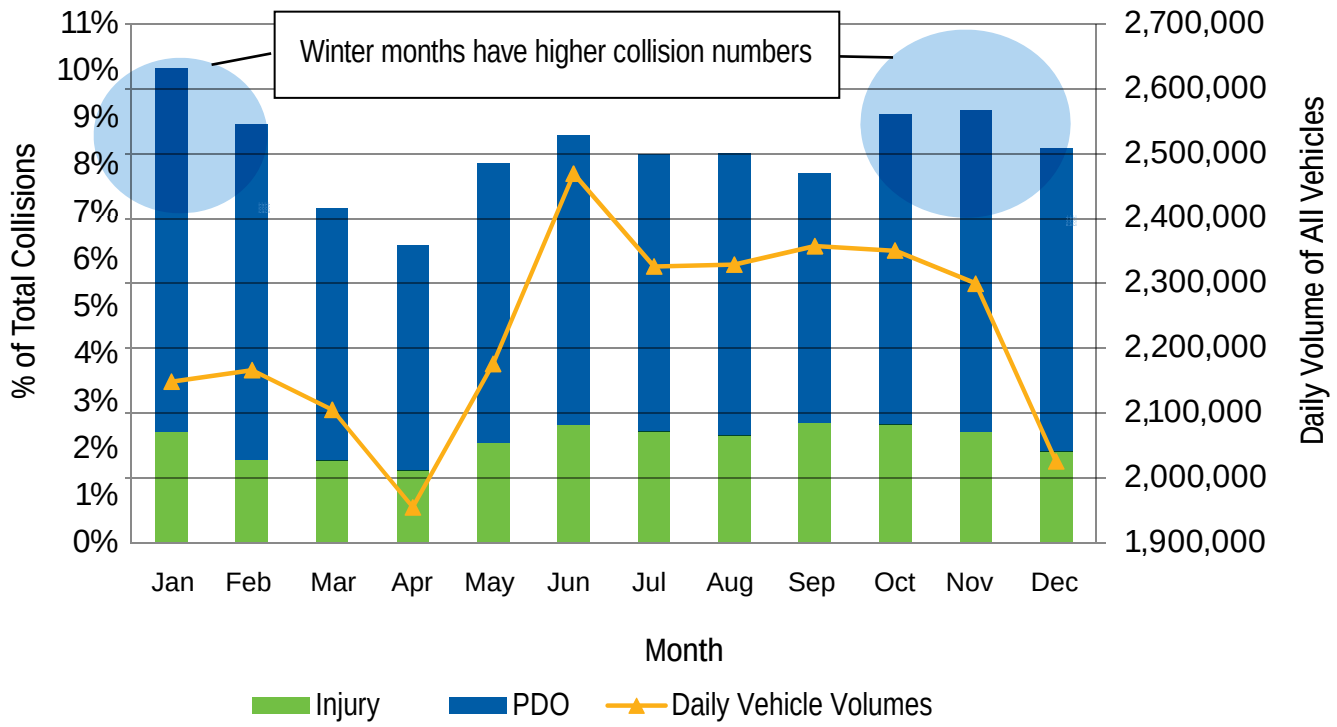
The month of June had the highest number of injury/fatal collisions and the third highest collision overall. June also had the highest daily vehicle volumes as weather conditions are favourable but summer vacations have not yet begun.

The months of January and November had the highest number of overall collisions and property damage only collisions. This is likely due to the impact of shorter daylight hours when the evenings are darker and weather conditions are less favourable for road users.

During the winter months, adverse or snowy weather makes driving more dangerous by reducing tire traction and impairing visibility. Drivers typically adjust to the road condition and drive more slowly and carefully in snowy weather and many people avoid or postpone unnecessary travel. This suggests less severe collisions (those producing only property damage) increase during winter, while more severe collisions (those resulting in injuries and fatalities) decrease.

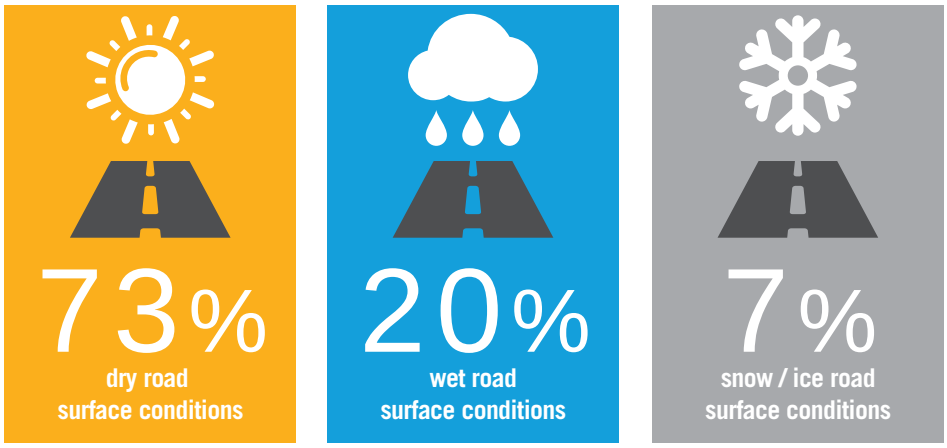
During the spring, which have the lowest number of collisions, drivers typically continue to drive in winter driving mode even though weather conditions are more favourable for road users.

COLLISIONS BY MONTH, THREE-YEAR AVERAGE, 2018-2020



*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

The majority, 73%, of all collisions occurred during dry road surface conditions, 20% occurred during wet road surface conditions and 7% of collisions occurred during snow/ice road surface conditions. During 2020, the Region experienced rain or snow weather events on 70 days and 37 days respectively. These observations are consistent with ongoing driver education campaigns about the need to drive according to surface conditions.



Although most collisions occur during dry conditions, adverse weather conditions contribute to peak collision days. The top 10 high frequency collision days between 2018 and 2020 experienced a winter event, or its aftermath. The number of collisions that occurred on the highest days was about triple York Region's average of 17 collisions per day. The top 10 days that experienced the most collisions are highlighted in the table below.

TOP 10 HIGH FREQUENCY COLLISION DAYS, 2018-2020

Date	Day of Week	Number of Collisions	Rain	Snow
2018-02-07	Wednesday	61		●
2019-11-11	Monday	58		●
2019-02-27	Wednesday	51		●
2020-02-28	Friday	51		●
2019-12-06	Friday	49		●
2019-01-19	Saturday	45		●
2020-12-01	Tuesday	44		●
2019-12-02	Monday	44		●
2018-02-09	Friday	44		●
2019-12-19	Thursday	43		●

*Collision data is from YRP MVA reports
*Weather data is from Environment Canada

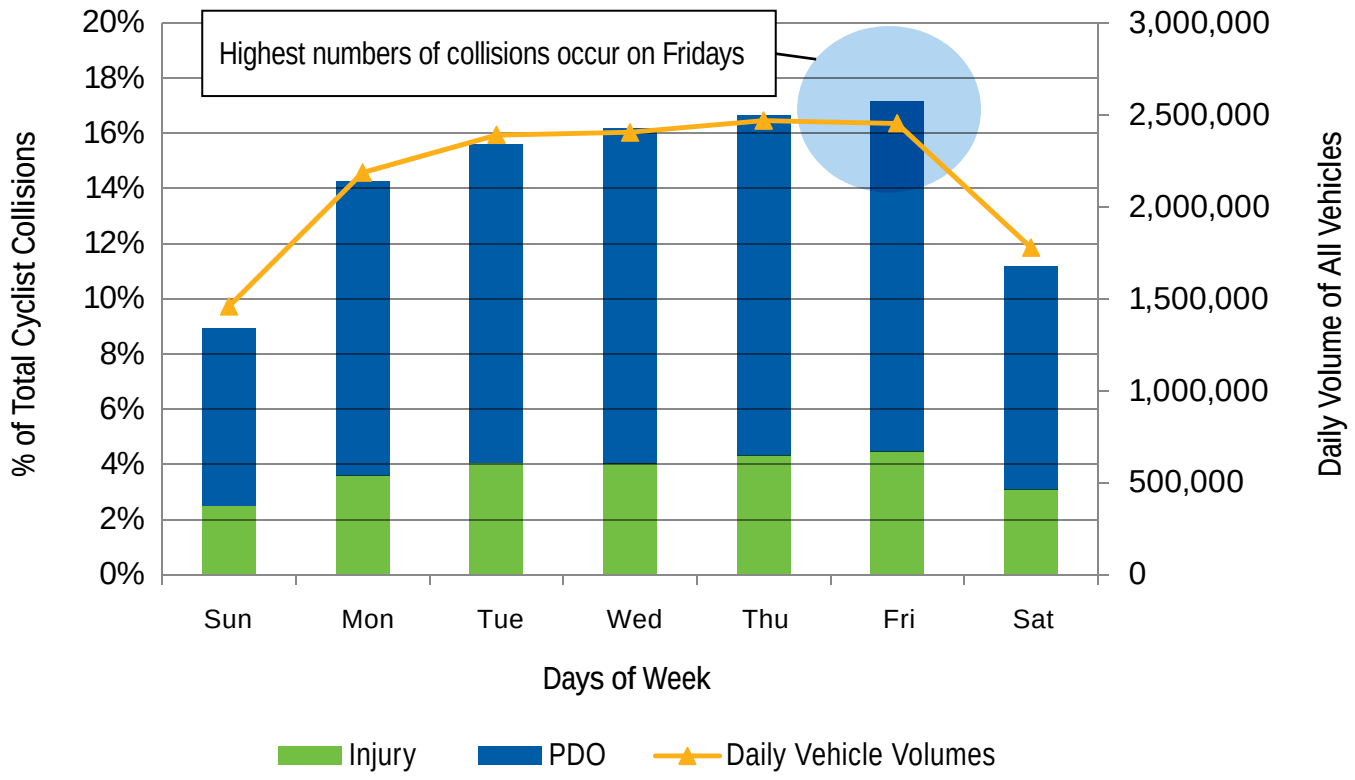
During all winter months, collision rates on snowy days are significantly higher than those of the days without rain or snow. February has the highest daily collision numbers for snowy days, likely due to motorists not adjusting to winter driving conditions. During the warm months (May to September) without snow events, daily collision rates on rainy days are higher than those days with no rain.

Repaving increases tire grip and reduces collisions

New pavement can increase vehicle tire grip on the road surface and give drivers better control resulting in a reduction of rear-end collisions, and collisions related to aged pavement, bad weather, and slippery road surface. Three examples of repaved intersections, Yonge Street and Green Lane, Green Lane and 2nd Concession Road, and Kennedy Road and Helen Avenue/YMCA Boulevard, have experienced an overall collision reduction ranging from 23% to 79% and a collision reduction in adverse weather events ranging from 42% to 89%.

The day-of-week collision patterns correlates closely with typical day-of-week traffic volume patterns, with the highest number of collisions occurring on Fridays when people travel more.

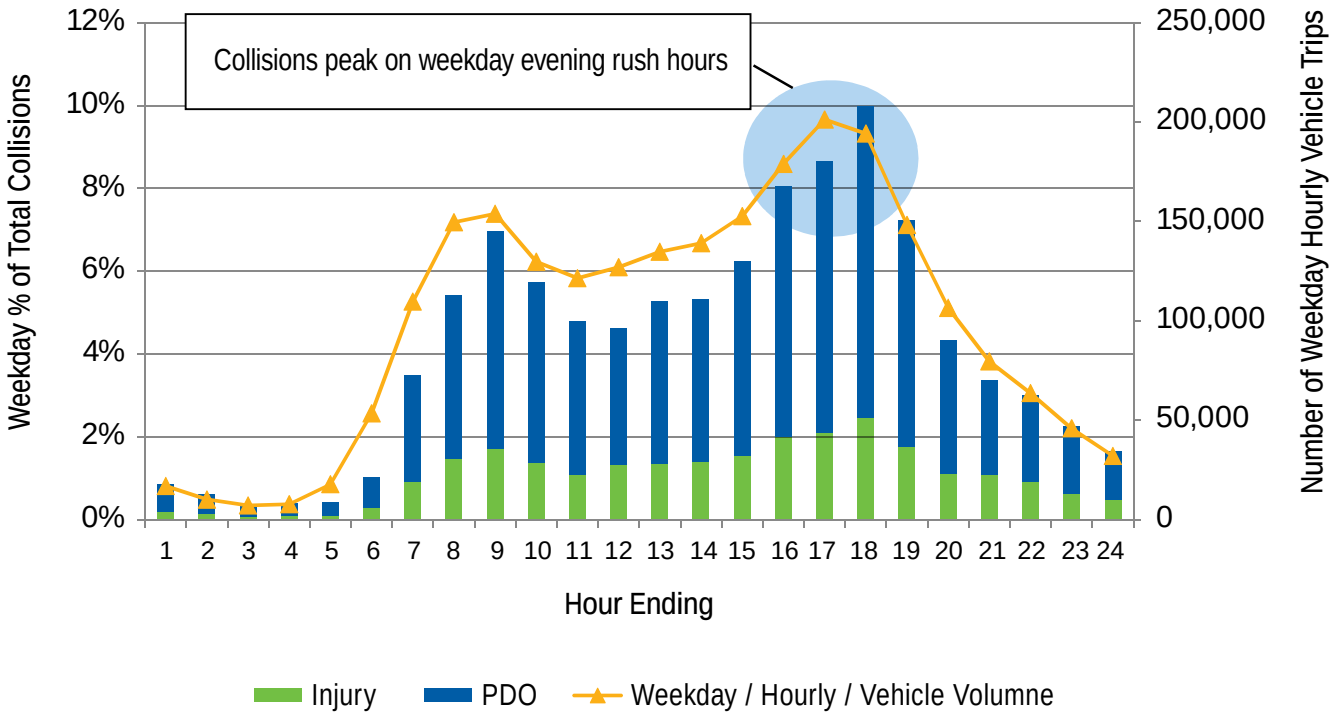
COLLISIONS BY DAY-OF-WEEK, THREE-YEAR AVERAGE, 2018-2020

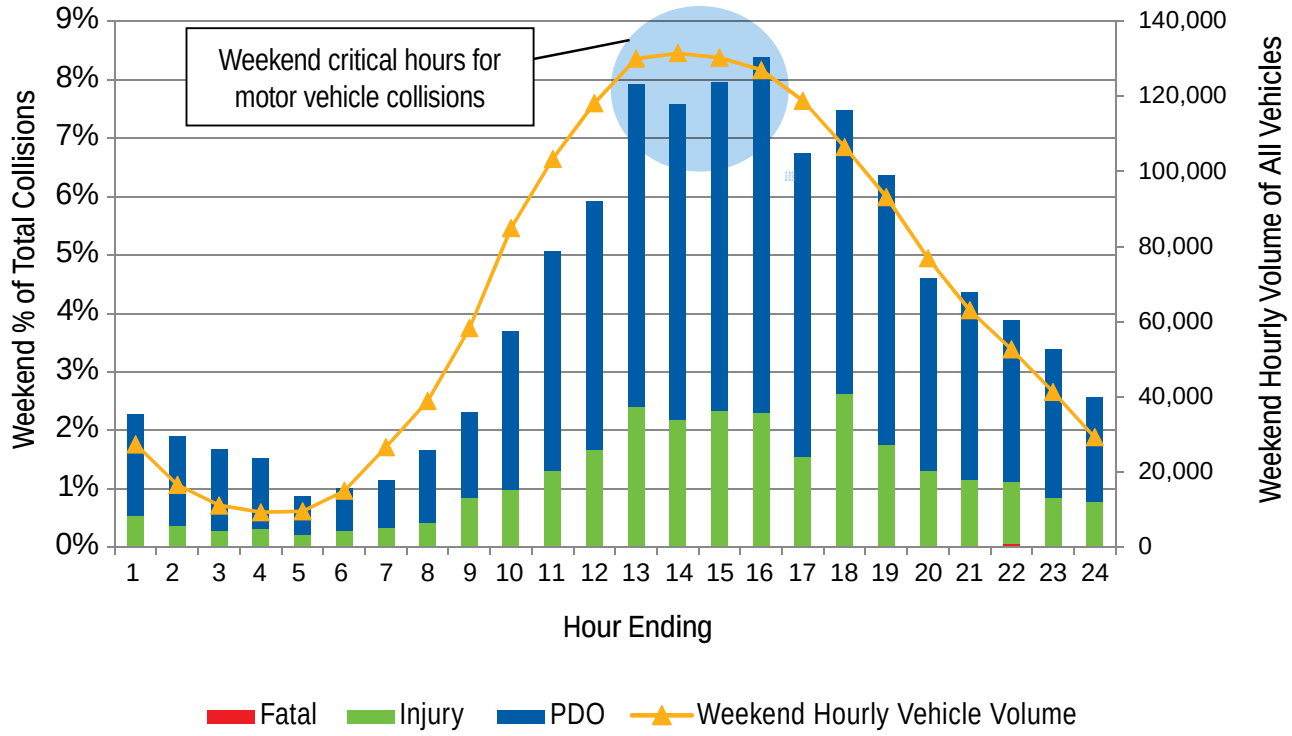


*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

The time-of-day collision trend also correlates closely with typical daily traffic volume patterns (i.e. high numbers of collisions occur during highest traffic volume times). The highest number of collisions occurred on weekdays, between 7 a.m. and 10 a.m., and 3 p.m. and 7 p.m., accounting for half of all collisions. Collisions were higher during the afternoon on weekends, which is consistent with the distribution of daily vehicle trips on weekends.

COLLISIONS BY TIME-OF-DAY, THREE-YEAR AVERAGE, 2018-2020





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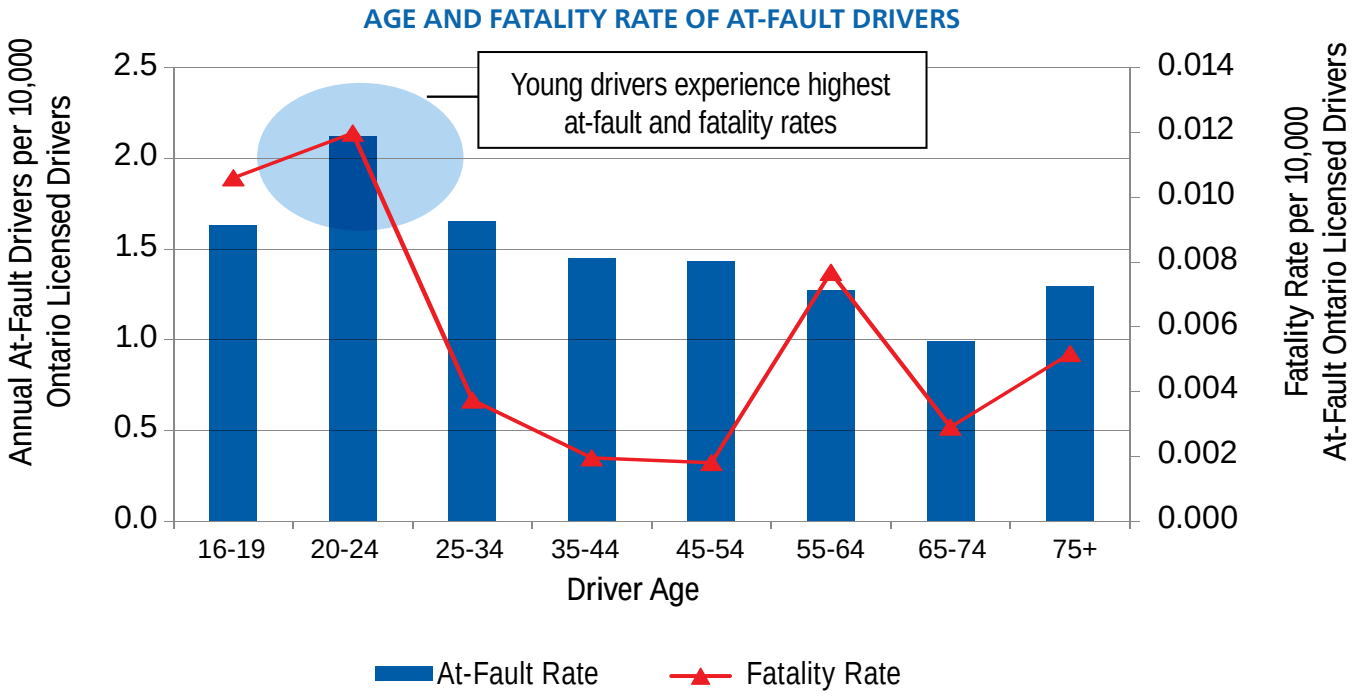
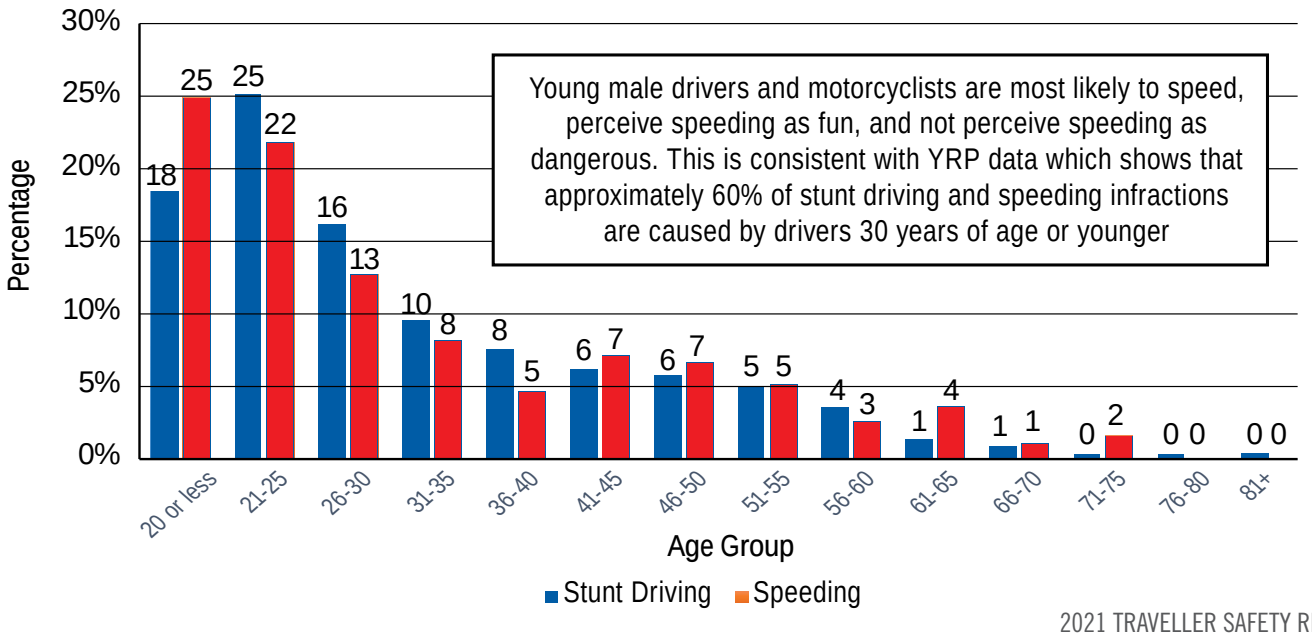
Age Profile



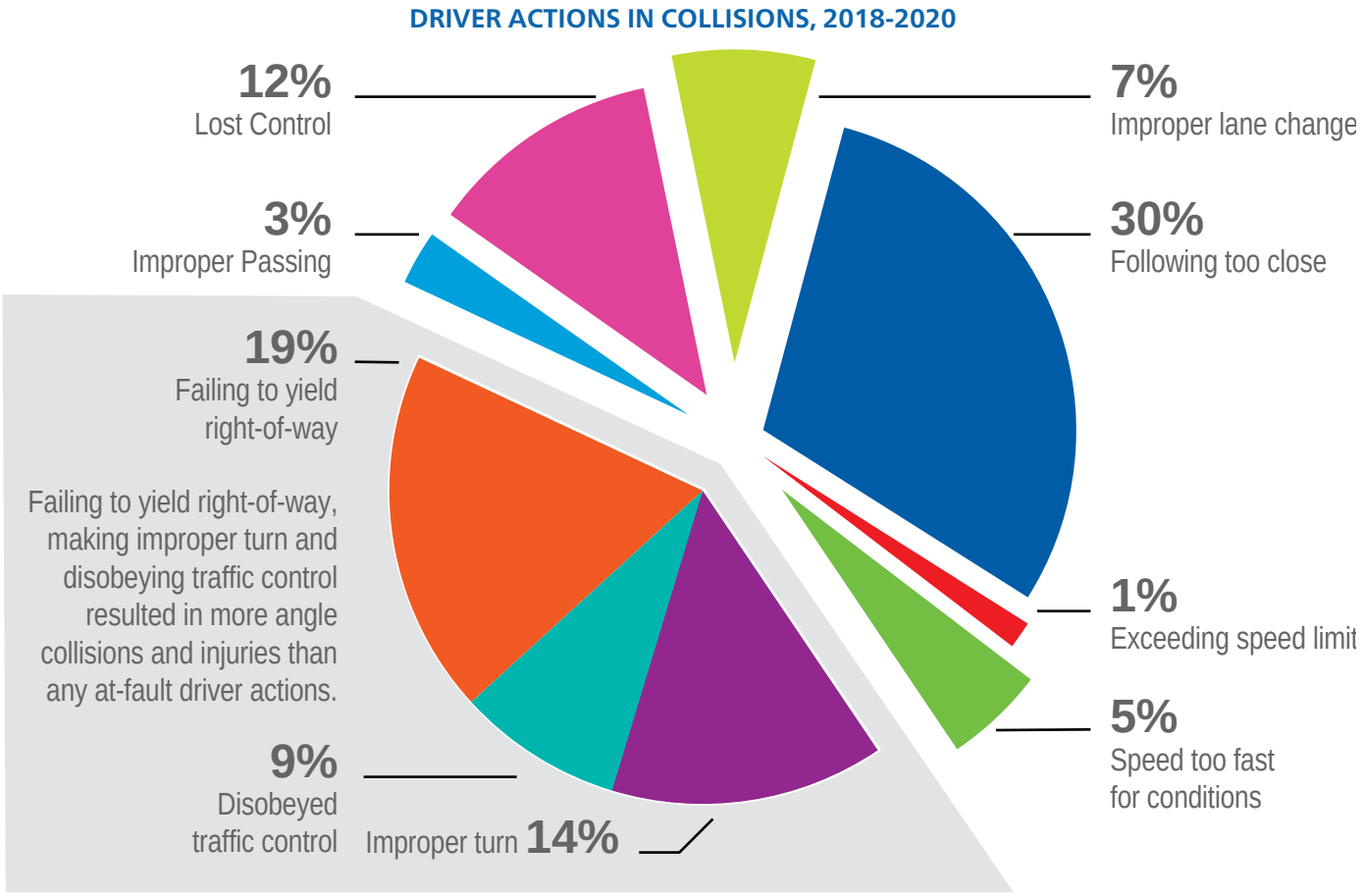
*The collision data is from YRP MVC reports
*The licensed drivers statistics and age distribution is from MTO 2017 Ontario Road Safety Annual Report

Data shows a need to reach drivers 16 to 25 years of age

The age distribution of at-fault drivers compared to drivers fatally injured is shown in the figure above. Teenagers and young adults below the age of 25 are most likely to be at fault in a collision and also most likely to be fatally injured in a collision. Based on 2017 hospitalization data from York Region Public Health, 20 to 29-year-olds have the highest rate of emergency department visits for traffic-related injuries compared to other age groups. MTO 2021 Road Safety Survey also found that young drivers are the most likely to feel that speeding is not dangerous for skilled drivers and driving fast is fun. This correlates with young drivers' overrepresented stunt driving and speeding violations reported by YRP as shown in the figure below. These findings stress the importance of continuing to target this age group with education and enforcement.



Driver Actions and Collision Impact Types

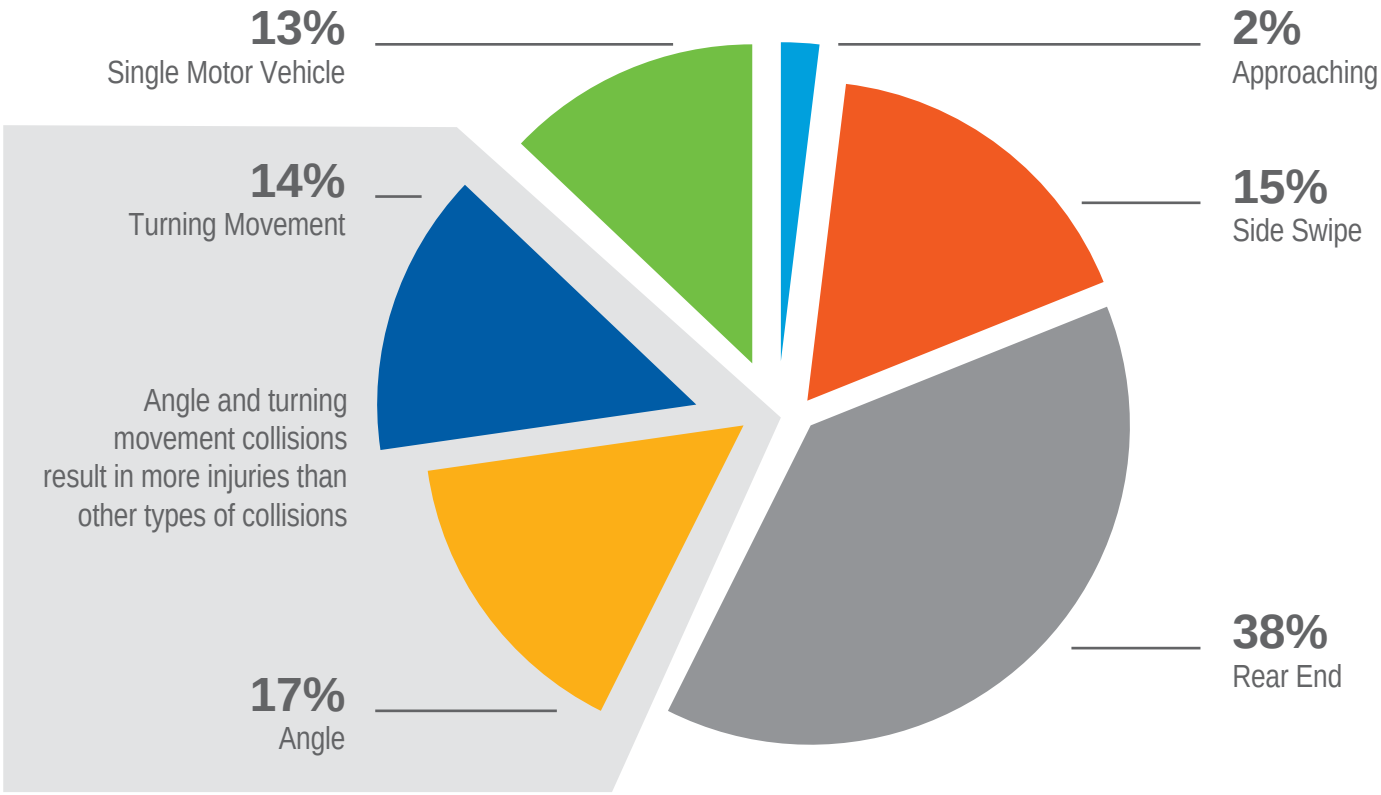


*The collision data is from YRP MVC reports

One of the most important collisions diagnostics is driver behaviour. The top at-fault action (30%) is following too closely, however, frequency of this is in a decreasing trend. The decreasing frequency of collisions resulting from drivers following too closely could be due to improved vehicle safety technologies such as brake assist as well as improvements of roadway safety technologies such as microsurfacing treatments.

THE REGION IS IMPLEMENTING PROTECTED LEFT TURNS, NO RIGHT TURNS ON RED, AND RED LIGHT CAMERAS TO REDUCE COLLISIONS CAUSED BY FAILING TO YIELD RIGHT-OF-WAY.

COLLISION IMPACT TYPES, 2018-2020



*The collision data is from YRP MVC reports

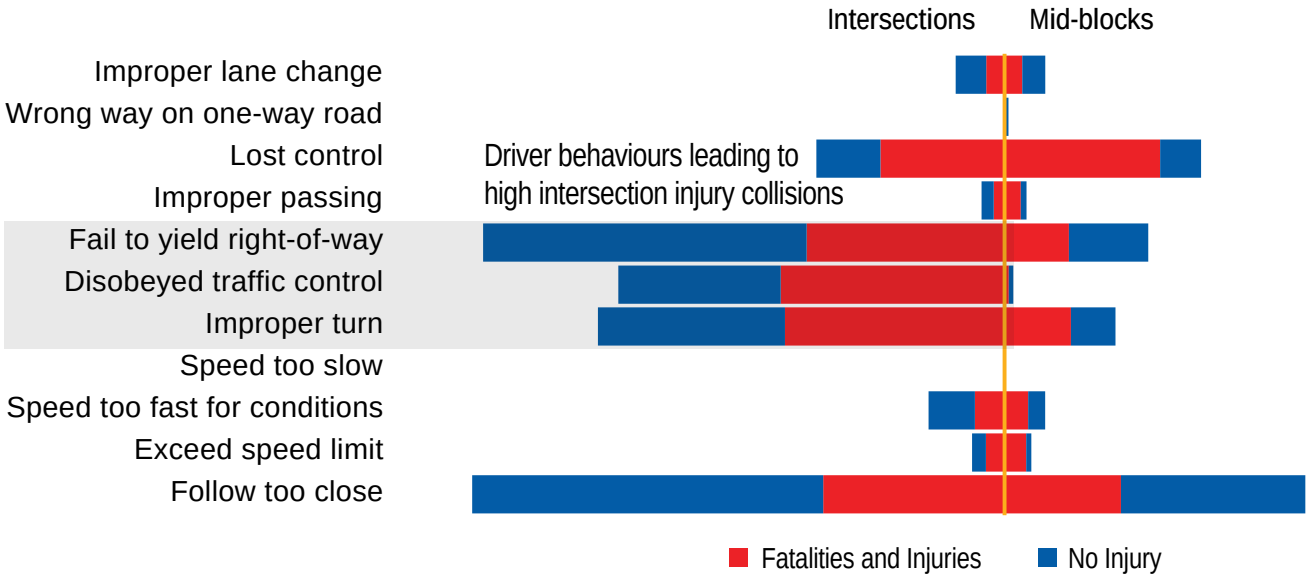
Following-too-close driver behaviour usually leads to rear-end collisions which is the most common collision impact type (35%). Rear-end collisions are declining, and may soon be overtaken by angle and turning movement collisions as the predominant collision type. Angle and turning movement collisions (31%) are also experiencing a declining trend although not as pronounced.

Reducing angle collisions is a priority for the Region as evidenced by the continued investment in the red light camera program. York Region also adheres to industry standards in conversion to intersection controls like all-way stop and traffic signal controls. The Region's before-after analysis found that all-way stop and traffic signal implementation could reduce angle collisions by as much as 100%.

BEFORE-AFTER ANALYSIS FOUND THAT ALL-WAY STOP AND TRAFFIC SIGNAL IMPLEMENTATION COULD REDUCE ANGLE COLLISIONS BY AS MUCH AS 100%.

Driver Actions

DRIVER ACTIONS AND COLLISION LOCATIONS



*The collision data is from YRP MVC reports

A focus on reducing conflict points

After following too closely, three major unsafe driver actions at intersections include failing to yield the right-of-way (19%), making an improper turn (14%) and disobeying traffic control (9%). More than one-third of collisions caused by these three unsafe driver actions result in injuries or fatalities, compared to only 23% of collisions caused by following too close.

FULLY PROTECTED LEFT TURN MOVEMENTS CAN REDUCE VEHICLE-TO-VEHICLE CONFLICTS BY AS MUCH AS 80%.

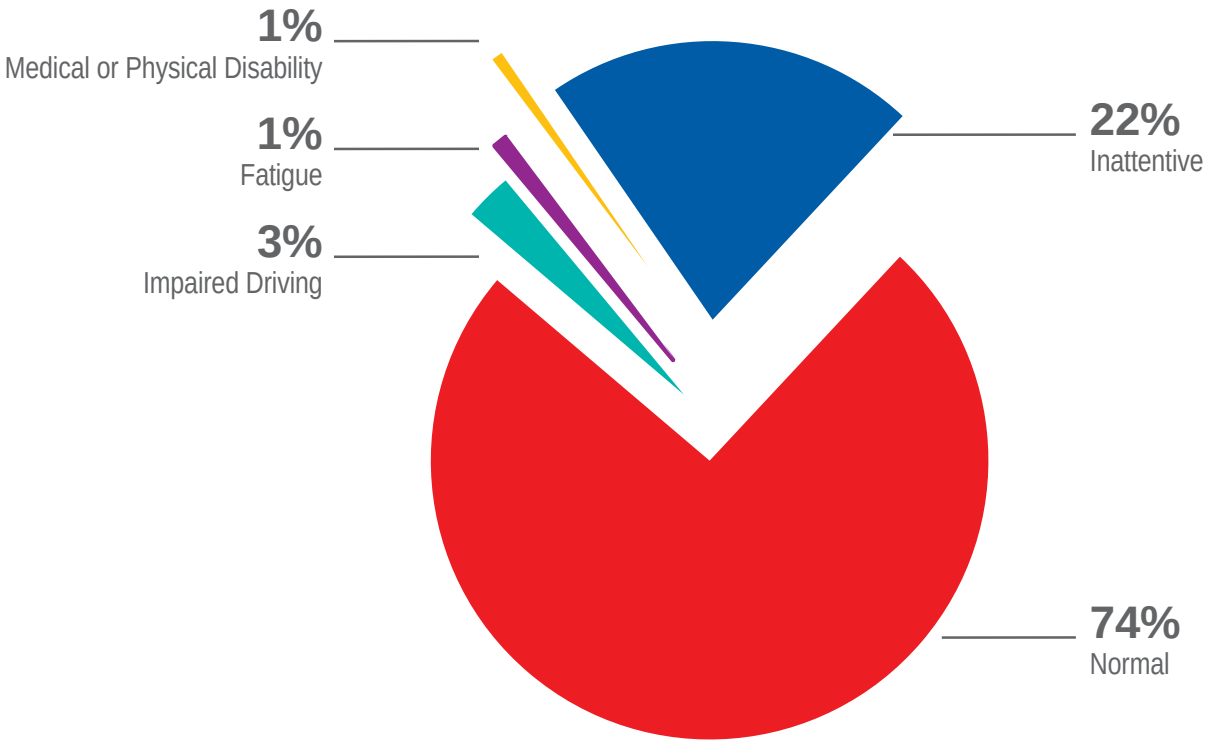
The Region has been focusing on reducing conflict points and frequency at intersections. An ongoing initiative is the conversion from protected/permissive left turn phases (advanced green signal before full moves green signal) to fully protected left turn phases (left turns only allowed on advanced green arrow). This initiative reduces conflicts between left turning vehicles with through moving vehicles in the opposite direction. Preliminary data suggest that protected left turn movements reduce vehicle-to-vehicle conflicts by as much as 80%.

Fully protected left turn phases have been implemented on intersections along the Region's bus rapidways. Along Highway 7 East, between Bayview Avenue and South Town Centre Boulevard, York Region's first bus rapidway, annual average intersection collisions have been reduced by 47% since its completion in 2014. Along Davis Drive, between Yonge Street and just east of Southlake Regional Health Centre, which is the Region's second bus rapidway in operation, annual average intersection collisions have been reduced by 44% since its completion in 2015. Based on the demonstrated traffic safety improvement at these intersections, in 2022, the Region will implement fully protected left turn phases on Highway 7 at Red Maple Road and Silver Linden Drive.

Another measure that could potentially reduce left turn related collisions is to add buffer area pavement markings between left turn and through lanes for improved drivers' visibility as shown here. Through systematic review, the intersections of Rutherford Road and Sweetriver Boulevard, Yonge Street and Green Lane, and Bathurst Street and King-Vaughan Road/Milos Road have been selected to implement this measure in 2021.

Distracted Driving

COLLISIONS BY AT-FAULT DRIVER CONDITION, 2018-2020



*The collision data is from YRP MVC reports

DISTRACTED DRIVING IS THE TARGET OF YORK REGION'S AWARD-WINNING PLEDGE TO IGNORE CAMPAIGN.

Distracted driving remains a top concern

Collisions where the condition of at-fault driver was recorded as "normal" or "unknown" accounted for 74% of all collisions. Of the remaining at-fault drivers, most were identified as distracted (inattentive) driving.

New distracted driving laws on using cell phones while driving came into effect in Ontario on January 1, 2019. Drivers caught talking on their phones, texting, dialing or emailing using a hand-held device, such as a cell phone and other entertainment devices, will be fined up to $1,000 with a three-day license suspension and three demerit points.

Even with the new law, 22% of at-fault drivers are driving distracted based on York Regional Police MVA reports. According to CAA:

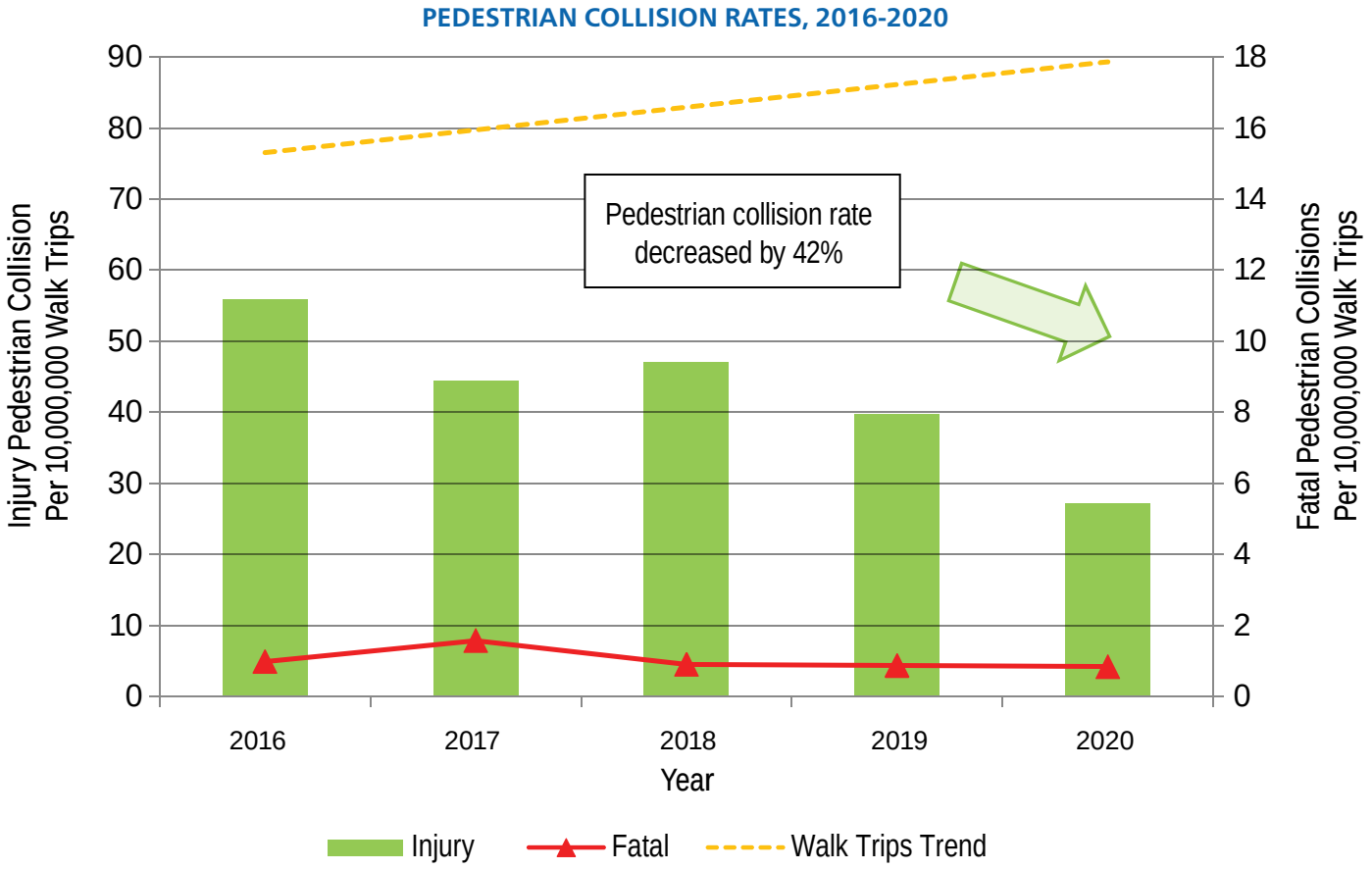
- Drivers talking on mobile devices, either hands-free or hand-held are up to four times as likely to be involved in a crash.
- 80% of collisions and 65% of near crashes have some form of driver inattention as contributing factors.
- Distraction was a factor in nearly 6 out of 10 moderate-to-severe teen crashes. (AAA Foundation for Traffic Safety, 2015)
- Almost half of all people fatally injured in teen (15-19 years of age) distraction-affected crashes were teens themselves. (National Highway Traffic Safety Administration, 2013).

Based on the 2021 MTO Road Safety Survey, approximately 20% of Ontario residents report having read or sent text messages while stopped or slowed at a traffic light or driving, or held a cell phone while driving at least weekly — an increase since 2017. The survey shows 30-40% young male drivers and motorcyclists regularly engage in distracted driving behaviours — the highest of all age groups.

While the COVID-19 pandemic has not impacted perceptions of road safety overall, some believe there has been an increase in risky driving behaviour. About one-third of Ontario residents believe that all forms of distracted driving have increased since March 2020, and a similar proportion believe all forms of impaired driving have also increased. Nearly 50% believe speeding has increased and 40% believe aggressive driving has increased. This perception is consistent with the fact that stunt driving offences in 2020 have doubled compared to 2019.

Distracted driving is the target of York Region's Pledge to Ignore campaign, which won the IABC Award of Excellence and MTO Road Safety Initiative of the Year. The Pledge to Ignore campaign is designed to help save lives by asking travellers to commit to not using a cell phone while driving or walking near traffic. The goal is to obtain as many pledges as possible from residents across York Region. Each pledge represents one less distracted driver. To date, the campaign has received more than 85,000 pledges.

Pedestrians ↓ 42%



*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies

Pedestrians are the most vulnerable road users

The pedestrian collision rate in 2020 is 42% lower than the previous four-year average as shown in the chart. As the number of walking trips on regional roads have increased, the injury collision rate is decreasing. Annual fatal collision numbers are stable, but proportionately remains low (2.3%) among total collisions. While 24% of motor-vehicle only collisions resulted in injuries or fatalities, almost all pedestrian collisions (94%) resulted in pedestrians' injury or death. Pedestrians are the most vulnerable travellers on the Regional transportation system, and lack personal protection compared to travellers in enclosed vehicles.

Key trends observed:

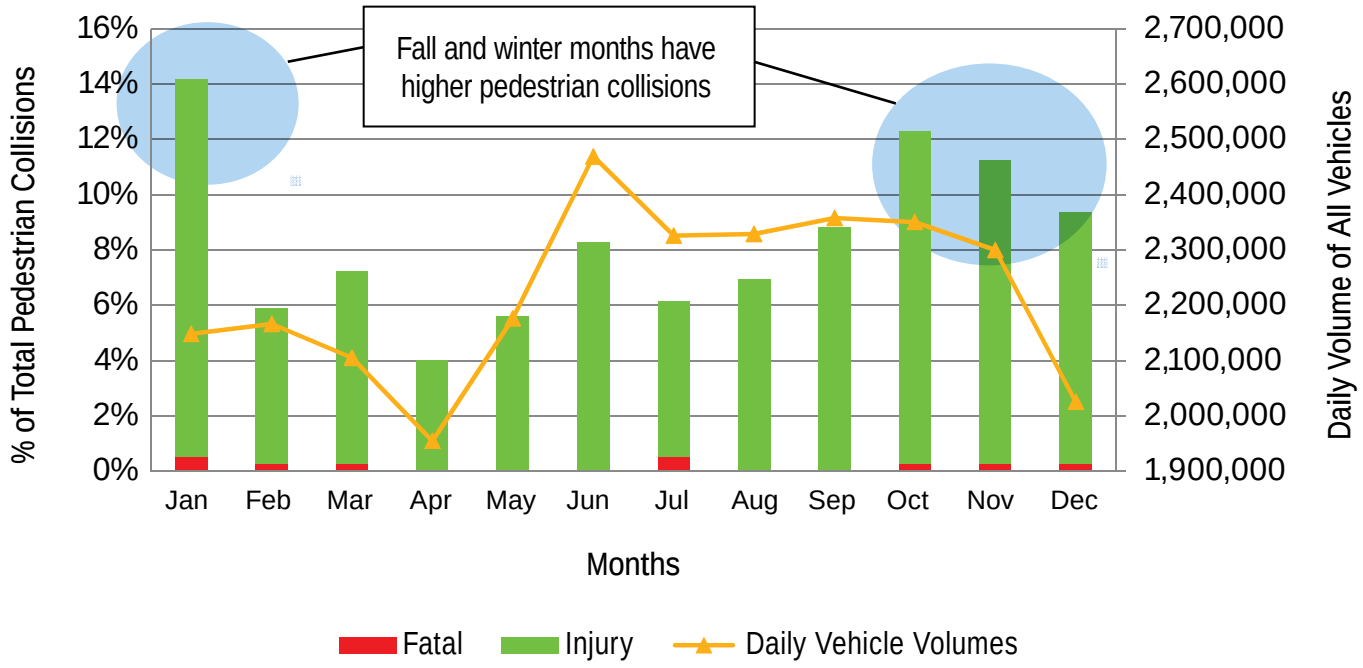
- The pedestrian collision rate has decreased by 42% due to the traffic reduction seen during the COVID-19 pandemic because of public health restrictions
- Almost all pedestrian collisions (94%) resulted in pedestrians' injury or death
- Young pedestrians are more likely to get injured in collisions, and senior pedestrians over 75 years old are most likely to be fatally injured than other age groups
- Pedestrian safety is affected by environmental factors like daylight levels
- The majority of pedestrian collisions occur at intersections (87%) as a result of high presence and a high occurrence of conflict points between vehicles and pedestrians
- Right-of-way conflicts between pedestrians and motor vehicles and associated driver human errors caused most pedestrian collisions, especially at intersections

The Region continues to put these measures in place to address the priority pedestrian safety concerns:

- Implementing community safety zones in all school locations to encourage compliance with the rules of the road
- Piloting automated speed enforcement in select school zones (2021-2023)
- Piloting leading pedestrian intervals, right turn on red signal restrictions, fully protected left turns and advisory signage at intersections with high conflict rates between pedestrians and motor vehicles
- Installing pedestrian crossing devices in accordance with Provincial criteria
- Education, including the award-winning Pledge to Ignore campaign and the Be visible. Be seen. campaign

Pedestrian Collisions by Month, Day and Time

PEDESTRIAN COLLISIONS BY MONTH, THREE-YEAR AVERAGE, 2018-2020

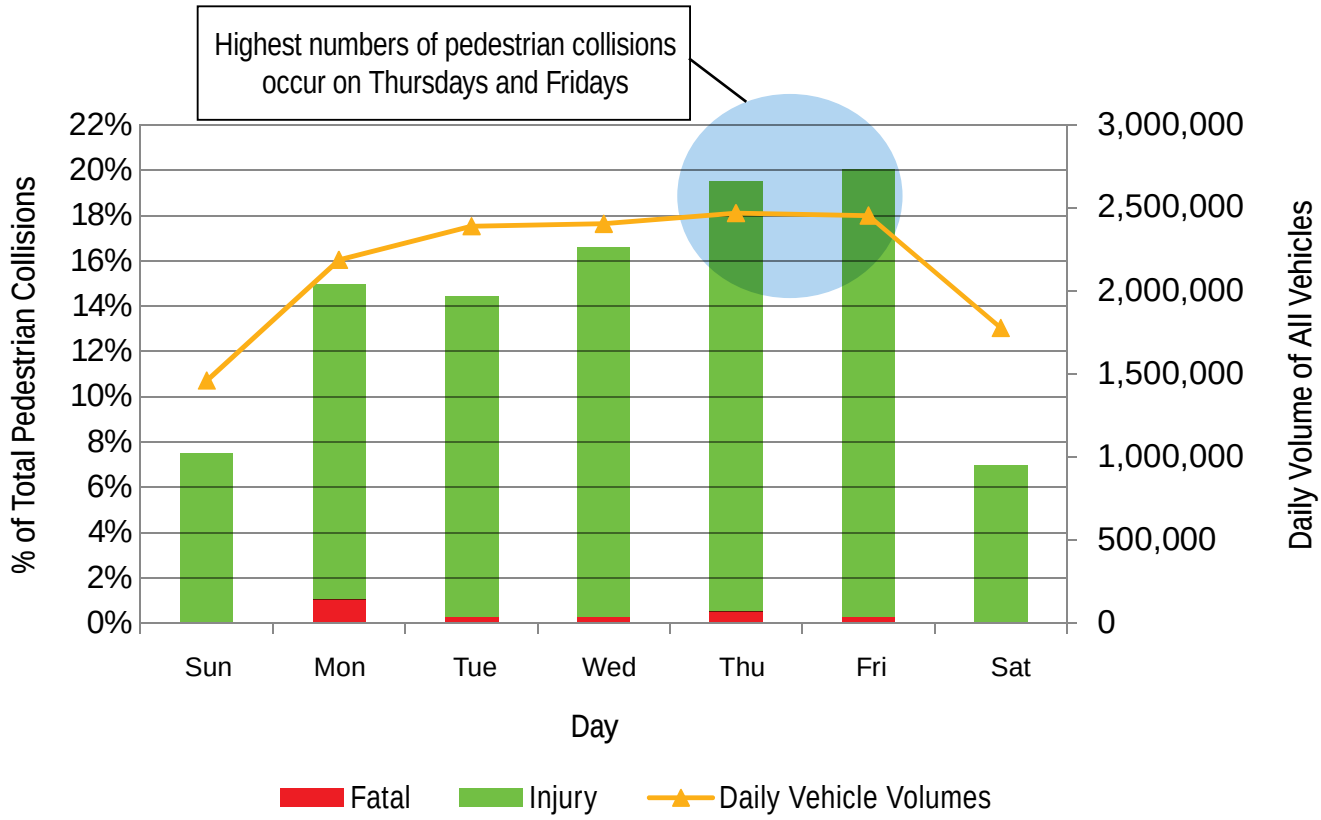


*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Pedestrian collisions occurred throughout the year, with the highest number of these collisions occurring in the fall and winter from October to January, despite the average daily vehicle volumes being low. This is likely the result of the daylight hours becoming shorter and pedestrians being less visible.

THE ANNUAL VISIBILITY CAMPAIGN TARGETS THE INCREASE OF COLLISIONS INVOLVING PEDESTRIANS IN THE FALL.

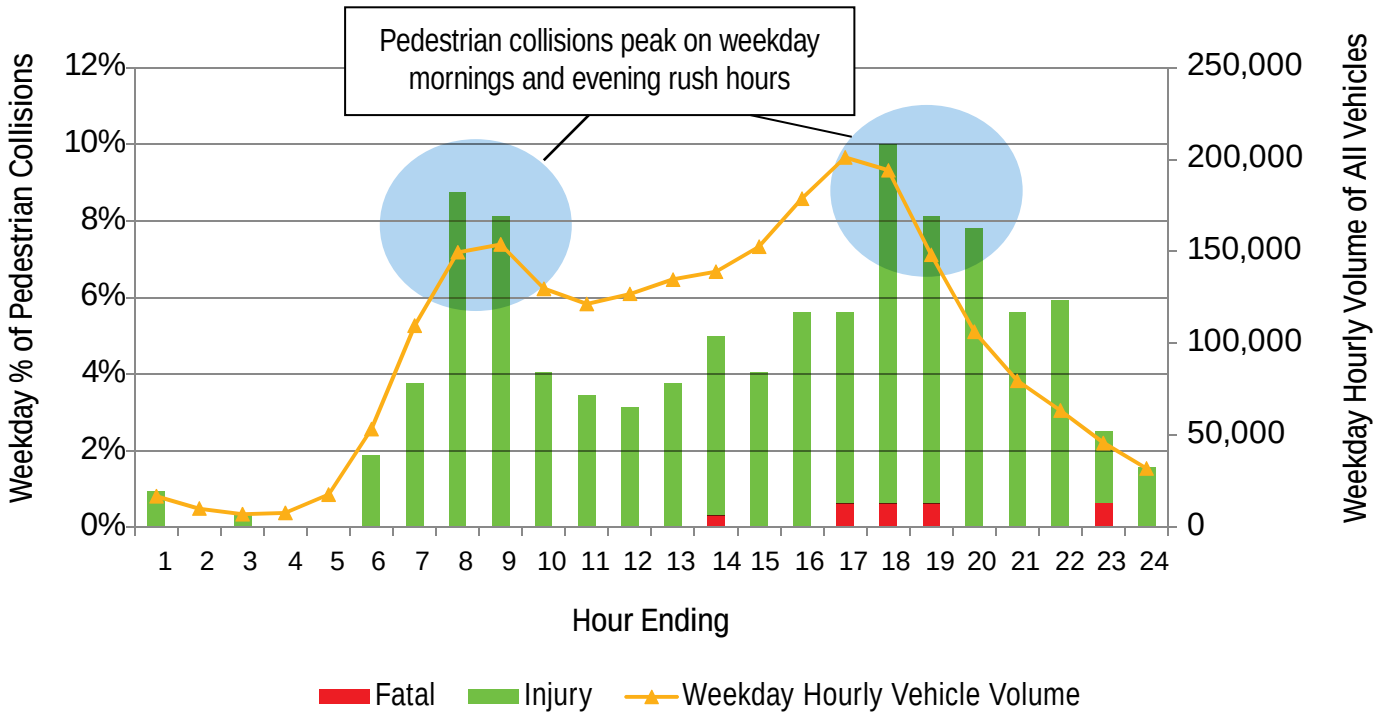
PEDESTRIAN COLLISIONS BY DAY-OF-WEEK, THREE-YEAR AVERAGE, 2018-2020

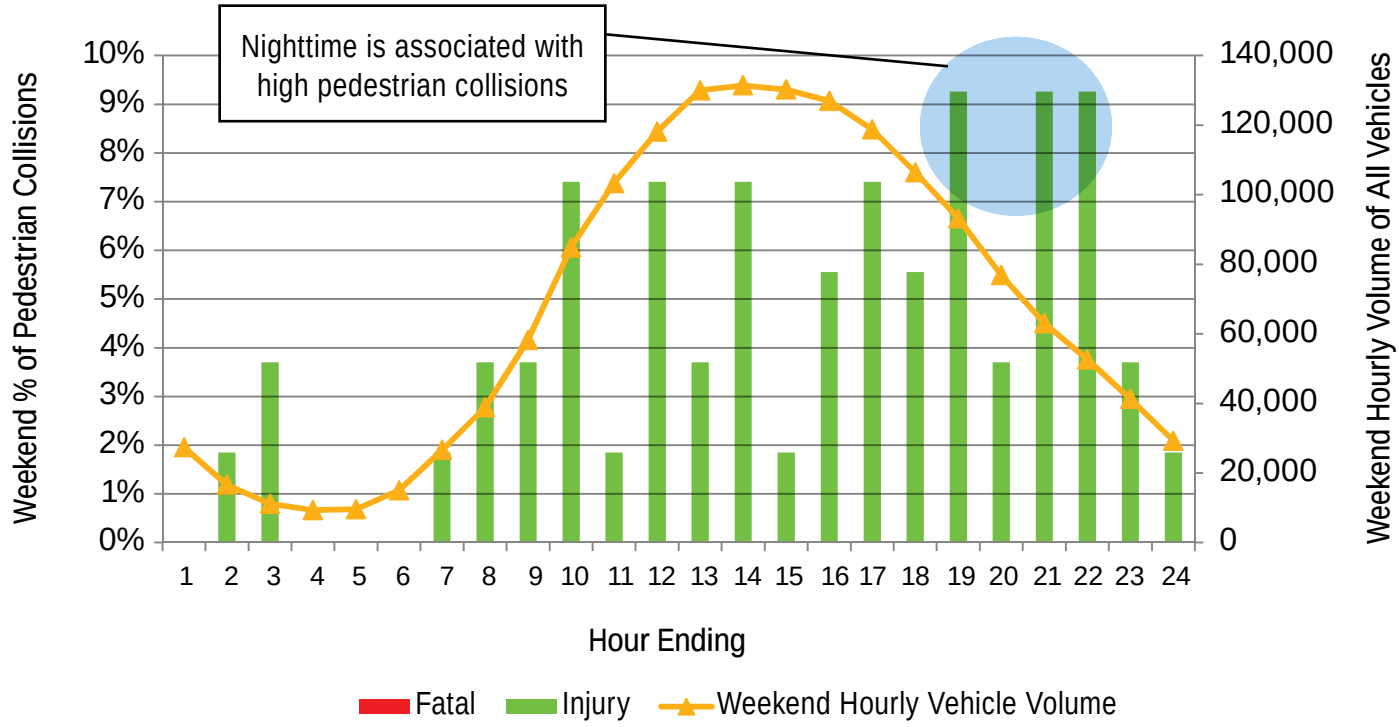


*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Pedestrian collisions were more likely to occur on Thursdays and Fridays, correlating closely with typical weekly traffic patterns.

PEDESTRIAN COLLISIONS BY TIME-OF-DAY, THREE-YEAR AVERAGE, 2018-2020





*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Be visible. Be seen.

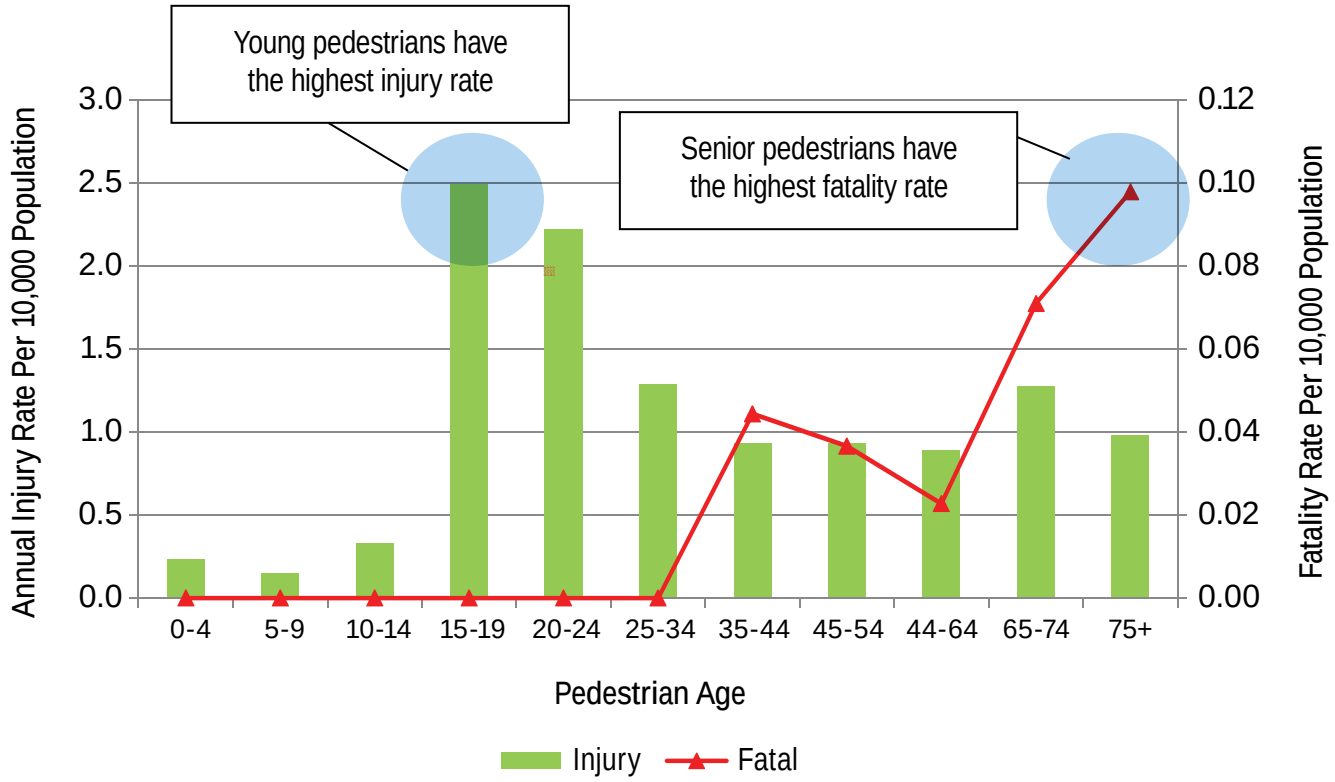
The highest number of pedestrian collisions occurred between 7 a.m. and 9 a.m., and 5 p.m. and 7 p.m. on weekdays. This is when traffic and pedestrian volumes are typically the highest, due to morning and evening commutes to work. Pedestrian collisions are more likely to occur in the evening, between 6 p.m. and 7 p.m., and 9 p.m. and 10 p.m. during the weekends when the road environment is getting dark and pedestrians are less visible.

The annual fall campaign — Be visible. Be seen — reminds travellers that shorter daylight hours, changing weather and reduced visibility makes pedestrians less visible to motorists. The campaign raises awareness about how to stay visible and encourages all travellers to look out for each other.

Age Profile

Pedestrians, cyclists and motorcycle riders are all vulnerable road users who are most at risk when a collision occurs. They do not have the protection of seatbelts, airbags, and a shell and metal frame of four-wheeled vehicles. Children may put themselves at risk because of inexperience. The elderly and those with mobility issues are especially vulnerable due to decreased ability to take evasive actions.

INJURED OR FATALLY INJURED PEDESTRIANS AGE DISTRIBUTION



*The collision data is from YRP MVC reports
*The population data is from Statistics Canada

Pedestrians 15 to 19 years are most likely to get injured in a collision. Senior pedestrians 75 years and older who are involved in a collision have the highest fatality rate.

Based on 2017 hospitalization data from York Region Public Health, collisions result in:
- 16 to 19-year-old pedestrians having the highest rate of emergency department visits; and,
- Pedestrians 70 years of age and older having the highest rate of hospitalizations.

Pedestrian Collision Locations

Most pedestrian collisions occur at intersections with traffic signals

More than 80% of pedestrian collisions occur at signalized intersections, as intersections are the locations with the highest pedestrian presence and a high occurrence of conflict points between vehicles and pedestrians.

Top 10 pedestrian collision locations based on 10-year totals are listed in the table below.

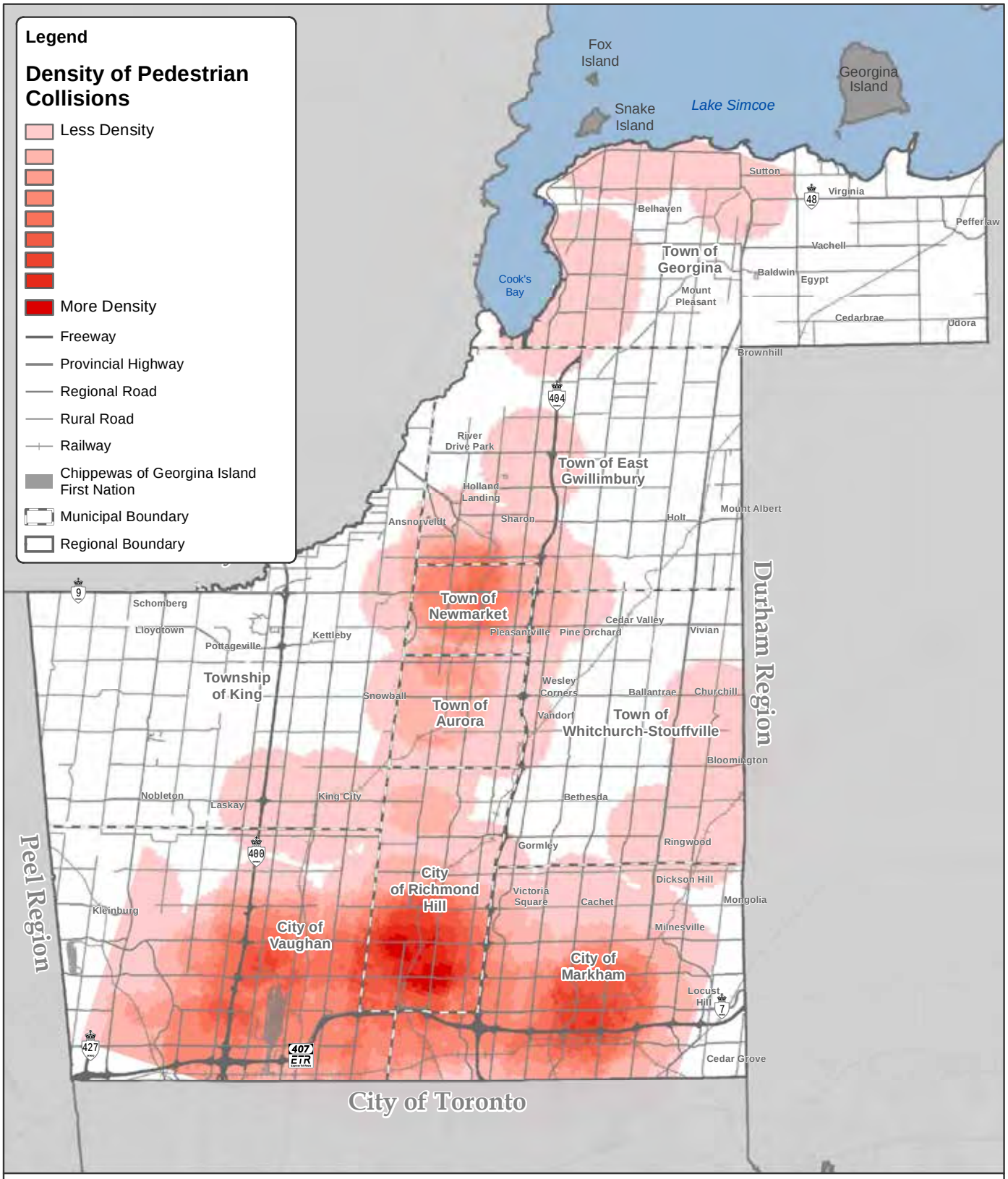
TOP 10 HIGHEST PEDESTRIAN COLLISION FREQUENCY LOCATIONS, 10-YEAR TOTAL 2011-2020

Location	Municipality	Ten-Year Injury Pedestrian Collisions	Ten-Year Total Pedestrian Collisions
Yonge Street and Carrville Road/16th Avenue	Richmond Hill	14	17
Highway 7 and McCowan Road	Markham	13	16
Major Mackenzie Drive West and Jane Street	Vaughan	14	15
Wellington Street East and Yonge Street/Wellington Street West	Aurora	13	14
Yonge Street and Clark Avenue/Clark Avenue West	Markham	13	13
Highway 7 and Weston Road	Vaughan	12	13
Highway 7 and Pine Valley Drive	Vaughan	11	12
Yonge Street and Mulock Drive	Newmarket	10	11
Centre Street and North Promenade/Disera Drive	Vaughan	10	11
Major Mackenzie Drive East and Bayview Avenue	Richmond Hill	9	10

*The collision data is from YRP MVC reports

Locations of all reported pedestrian collisions on Regional roads from 2018 to 2020 are illustrated in the collision density map on the next page.

Pedestrian collisions overwhelmingly occur in urban areas. Many of these two-stage intersections have been rebuilt as part of vivaNext Rapidway corridors with enhanced pedestrian safety features such as two stages pedestrian crossings, protected left turn movements, enhanced crosswalk pavement markings, and reduced curb radii to slow down right-turning vehicles.



2018-2020 Pedestrian Collision Hot Spot Locations Map

2021 Annual Collision Statistics Report

0 5 10 km

York Region

Produced by:
Transportation and Infrastructure Planning
Transportation Services

AnnualCollisionReport2021_maps\PedCollisions_heatmap\PedCollisions2018To2020.mxd

As a further step to predict intersection safety performance, a pedestrian and cyclist safety index was developed to prioritize Regional signalized intersections based on risk exposure. Following the principles of the National Cooperative Highway Research Program approach, the index was constructed as a weighted score taking into consideration variables such as road characteristic, road user volume, crossing distance, speed limit and environment. The sum of the factor scores equates to the total weighted prioritization score (out of 60) for each intersection. With higher scores indicating higher priority for improvement, a ranked list of intersections with scores over 48 (80% of 60) or higher are included in the table below.

Many of these intersections have also been rebuilt as part of vivaNext Rapidway corridors with enhanced pedestrian safety features such as two-stage pedestrian crossings, protected left turn movements, enhanced crosswalk pavement markings and reduced curb radii to slow down right turning vehicles.

INTERSECTION PRIORITY INDEX

Signalized Intersection	Variable Scores (all /5)										Factor Scores			Total Weighted Score (/60)
	Safety		Demand				Ex. Conditions							
	Collisions	PSI	Ped. Volume	Transit	Attractors	Pop. Density	Traffic Volume	Turning Volume	Speed	Approach Lanes	Safety (/20)	Demand (/20)	Ex. Conditions (/20)	
*Yonge Street and Carrville Road/ 16th Avenue**	5	5	5	5	5	5	5	4	0	5	20	20	14	54
*Yonge Street and Mulock Drive**	5	5	5	5	5	3	4	4	3	5	20	18	16	54
Major Mackenzie Drive East and Bayview Avenue	5	5	5	3	5	4	4	4	3	4	20	17	15	52
*Highway 7 and Weston Road**	5	5	5	5	3	0	5	5	4	5	20	13	19	52
*Weston Road and Rutherford Road***	5	5	3	3	3	4	5	5	3	5	20	13	18	51
*Highway 7 and Leslie Street**	4	5	5	5	5	0	5	4	4	5	18	15	18	51
*Yonge Street and Major Mackenzie Drive**	5	5	5	5	5	4	4	3	0	4	20	19	11	50
*Highway 7 and Pine Valley Drive**	5	5	4	5	2	1	5	5	3	5	20	12	18	50
*Yonge Street and Elgin Mills Road**	5	5	5	5	4	3	4	4	1	3	20	17	12	49
Yonge Street and Clark Avenue	5	4	5	5	4	5	4	3	0	5	18	19	12	49
Bathurst Street and Carrville Road/ Rutherford Road	5	4	5	3	5	2	5	4	2	5	18	15	16	49
Bathurst Street and Clark Avenue West	5	4	5	3	4	4	5	4	1	4	18	16	14	48

*Excluded due to recent or imminent construction
** Excluded due to identified traffic operational impacts

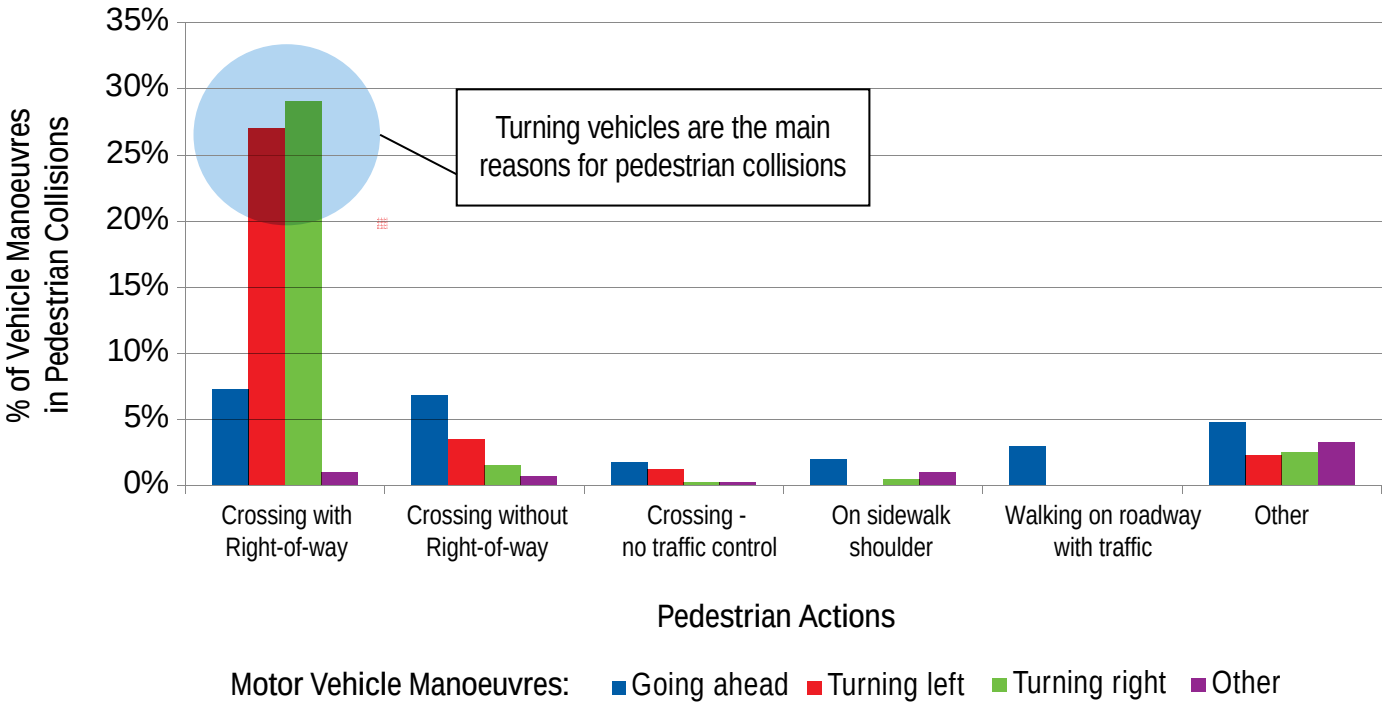
Driver and Pedestrian Actions

Collisions between pedestrians and vehicles were found to be predominantly attributed to improper driving actions. Pedestrians were considered at-fault in 29% of all pedestrian collisions. Of all pedestrian collisions resulting from improper driving actions, 71% were a direct cause of drivers failing to yield right-of-way; 12% were a result of drivers making improper turns.

77% OF PEDESTRIAN COLLISIONS ARE A DIRECT CAUSE OF DRIVERS FAILING TO YIELD RIGHT-OF-WAY.

Pedestrians crossing without right-of-way, including crossing mid-block without a marked crosswalk or crossing against the flow of traffic at a signalized intersection, accounted for 39% of all pedestrian at-fault collisions.

MOTOR VEHICLE MANOEUVRES IN PEDESTRIAN COLLISIONS



*The collision data is from YRP MVA reports

Overall, 68% of pedestrian collisions involve vehicles making left or right turns. Most occur when pedestrians are crossing with the right-of-way.

Pedestrian Safety Measures

Pilot programs to help change driver behaviour

Improving pedestrian safety remains a priority and York Region is currently piloting short-term safety measures, including leading pedestrian intervals (pedestrian gets a head start in crossing the road), right turn on red signal restrictions, fully protected left turns and advisory signage, to help reduce conflicts between drivers and pedestrians and increase driver awareness of pedestrians. According to a CAA survey, the top two safety initiatives to promote vulnerable road user safety are leading pedestrian intervals (supported by 51% of Ontarians) and ASE (supported by 39% of Ontarians). Due to the high risk exposure for pedestrians and cyclists (based on the above-noted safety index), the following intersections were selected for operational measures on a one-year pilot basis:

- Bathurst Street and Carrville Road/Rutherford Road
- Bathurst Street and Clark Avenue
- Major Mackenzie Drive and Bayview Avenue
- Yonge Street and Clark Avenue

The Region is also implementing other improvements, including the installation of PXOs, which consist of new signs and pavement markings that serve to enhance the mobility of pedestrians. A PXO is ideal for a location where some pedestrian demand exists but volumes are not enough to warrant traditional traffic or pedestrian signal installation. A PXO can be converted to a pedestrian signal in the future once it has met the warrant criteria. York Region Council approved a PXO policy in 2021, including the installation of three PXOs on Regional roads:

- Yonge Street at Holland Landing Community Centre (2021)
- Baseline Road west of Dalton Road (2022)
- Ninth Line and Elm Road (2022)

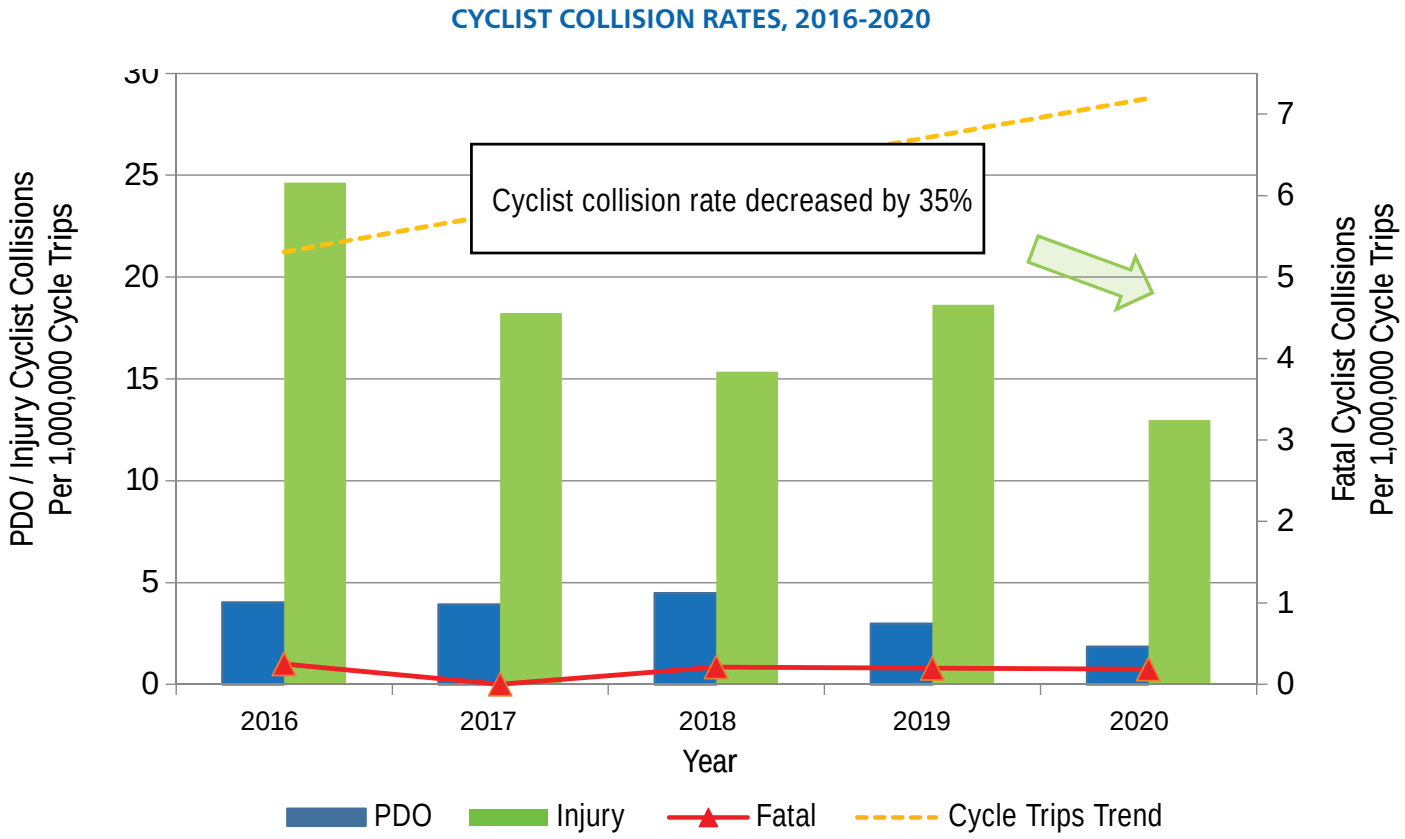
PXOs will also be installed in 2021 at the right turn channels for the following locations to improve pedestrian safety:

- Islington Avenue and Rutherford Road
- Major Mackenzie Drive and Bathurst Street
- Highway 7 and Highway 27

In May 2021, York Regional Council approved changes to the Region's speed limit policy to allow speed limits to be reduced by 10 km/h in more than 60 school zones. The new school zone maximum speed limit signs introduced by the Ministry of Transportation of Ontario will be installed, and all signs will show reduced speed limits in effect from 7 a.m. to 5 p.m., September to June. This initiative creates consistency and enhances safety during peak commute periods, when children are walking and cycling, being dropped off or picked up, and during school and after-school activities.

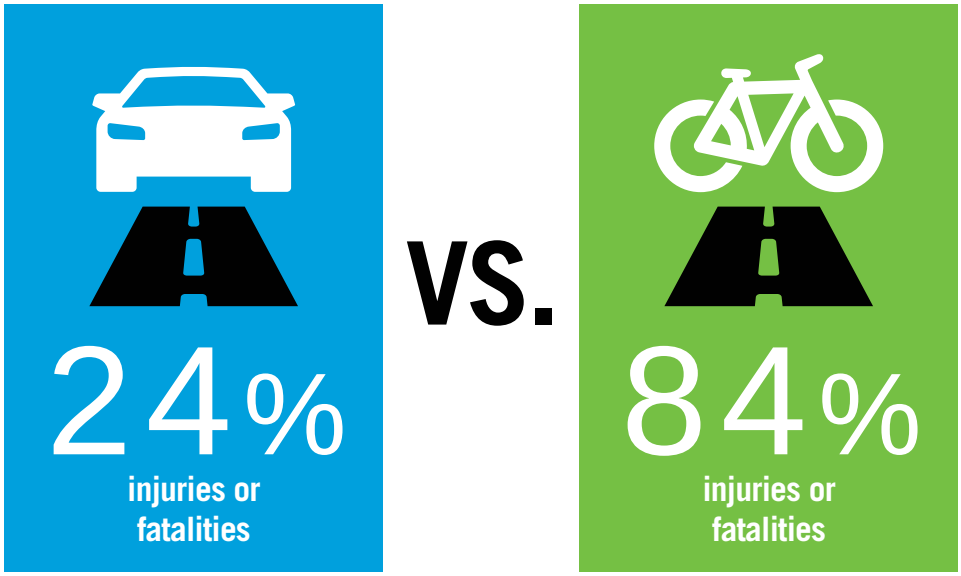
YORK REGION'S AUTOMATED SPEED ENFORCEMENT PILOT TARGETS SCHOOL ZONES.

Cyclists ↓ 35%



*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies
* Cyclist collisions include collisions involving e-scooters and e-bikes, as both these vehicles are coded as bikes in YRP MVC reports

Although the number of cycle trips being made on Regional roads has increased, injury collision rates have decreased. However, cyclists sustained injury in more than 84% of all cyclist collisions, while 24% of motor-vehicle only collisions resulted in injuries or fatalities.



Key trends observed:

- In 2020, the cyclist collision rate has experienced a 35% decrease due to the traffic exposure reduction seen during the COVID-19 pandemic because of public health restrictions
- The majority (84%) of cycling collisions resulted in injury or death
- Young cyclists are most likely to get injured or fatally injured in collisions
- Cyclist collisions are highly seasonal, mostly in summer months when cyclist activity is highest
- Majority of cyclist collisions occur at intersections (82%) as a result of high cyclist presence and a high occurrence of conflict points between vehicles and cyclists
- Motor vehicles are more likely to be at-fault (73%) in cyclist collisions
- Motor vehicles making turns, especially right turns, are mostly likely to get involved in cyclist collisions

Promoting safe cycling

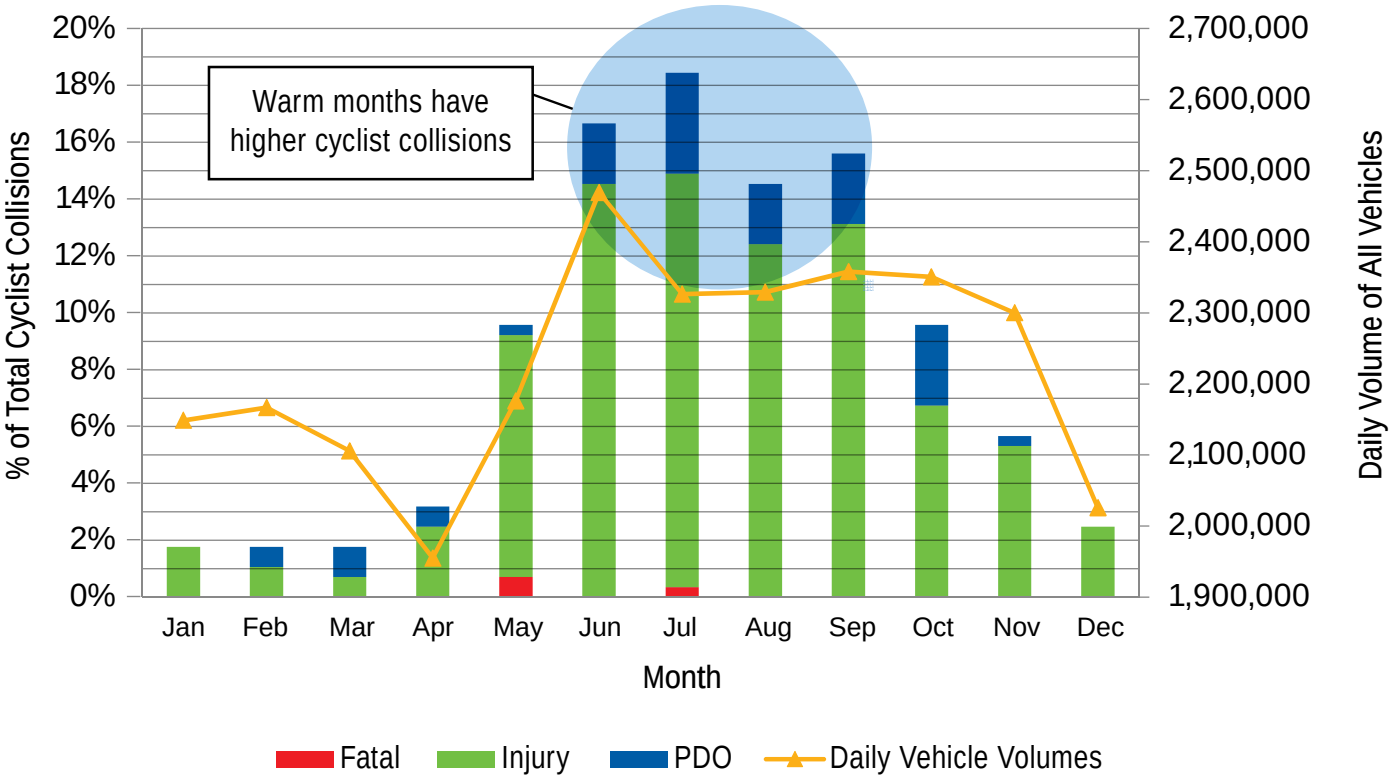
Through the york.ca/cycling web page and various initiatives, the Region continues to provide cycling safety education and promote safe cycling.

Many of the Region's safety measures are jointly aimed at pedestrian and cycling safety, including:

- Piloting leading pedestrian intervals, right turn on red restrictions, fully protected left turns and advisory signage at intersections with high conflict rates between cyclists and motorists
- Education, including the award-winning Pledge to Ignore campaign and the Be visible. Be seen. campaign
- Reducing speed limits in all school zones on Regional roads to protect vulnerable road users
- Bike lanes and multi-use pathways (MUPs) at critical cycling corridors
- Continued expansion of the Region's trail network including advancing the Lake to Lake Cycling Route and Walking Trail and the South York Greenway Cycling, Pedestrian and Micromobility Corridor
- Cycling safety and education resources are available at york.ca/cycling

Cyclist Collisions by Month, Day and Time

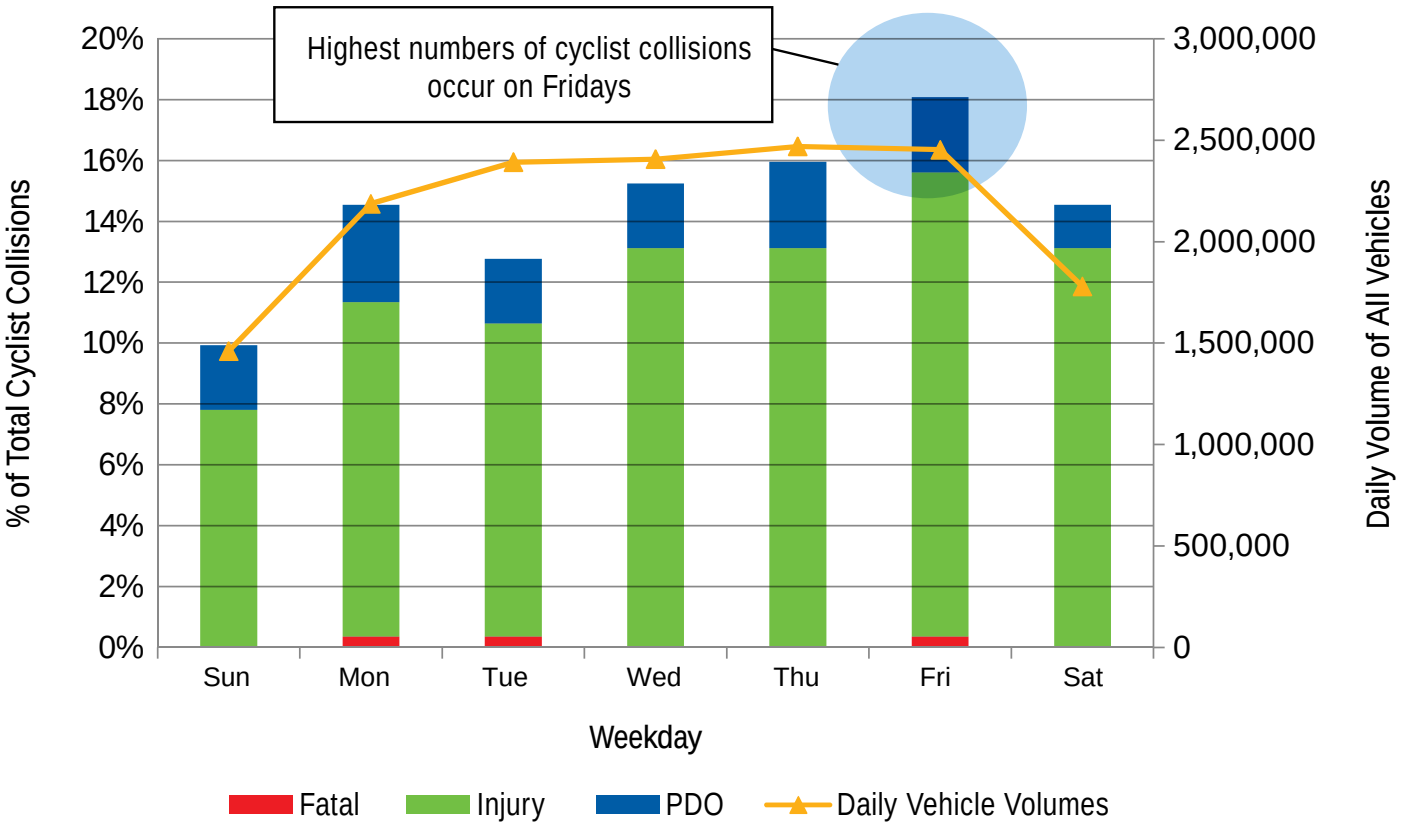
CYCLIST COLLISIONS BY MONTH, THREE-YEAR AVERAGE, 2018-2020



*Collision data is from YRP MVA reports
*Number of trips is based on TTS studies and the Region's PCS data

Cyclist collisions occurred in nearly every month of the year, with the most occurring in the summer months (June to September), accounting for 65% of the total. In contrast, only 4% of cyclist collisions occurred in the winter (January to March) as less cyclists tend to be on the roads when the weather is not as favourable.

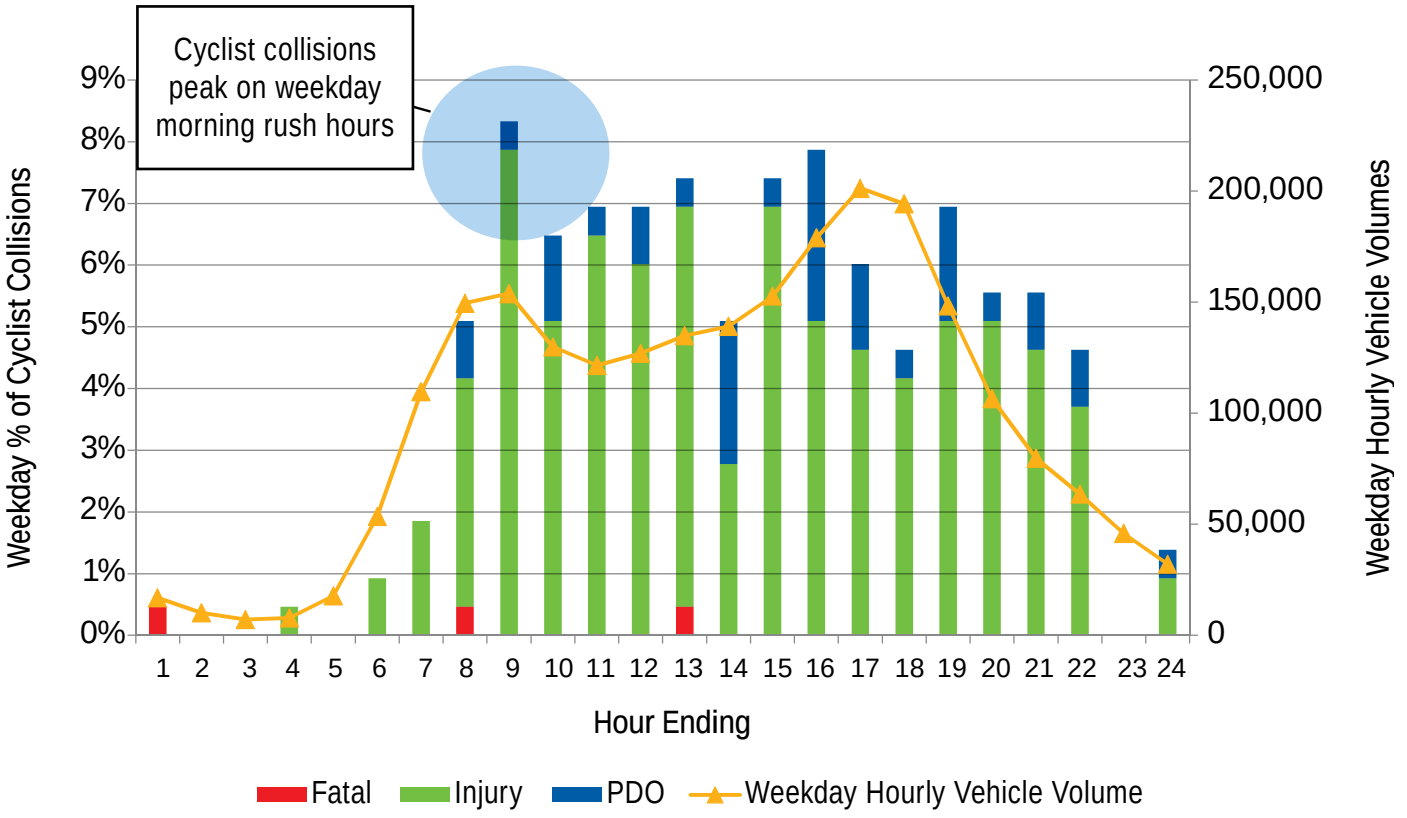
CYCLIST COLLISIONS BY MONTH, THREE-YEAR AVERAGE, 2018-2020

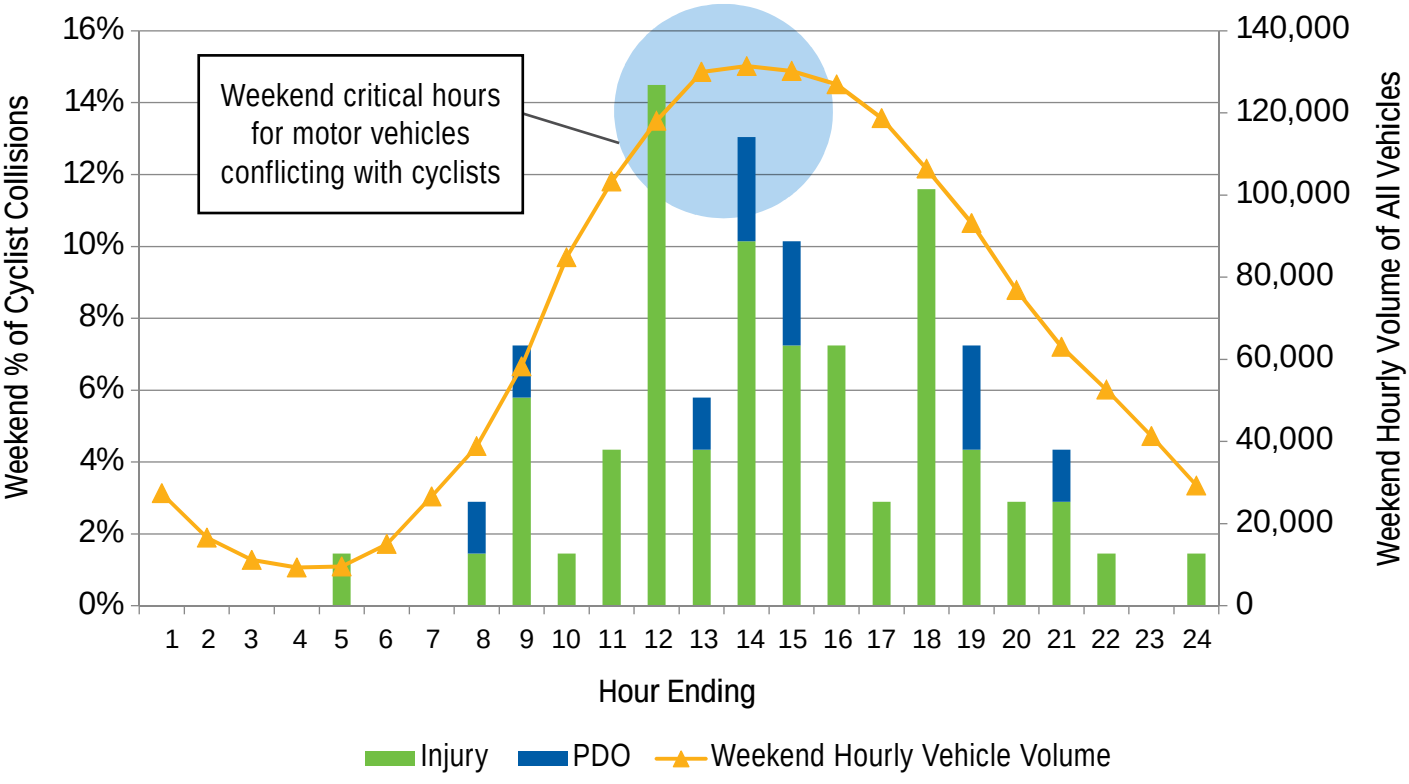


*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Cyclist collisions were more likely to occur on Thursday and Friday, correlating closely with typical weekly traffic patterns and patterns seen for pedestrians.

CYCLIST COLLISIONS BY TIME-OF-DAY, THREE-YEAR AVERAGE, 2018-2020



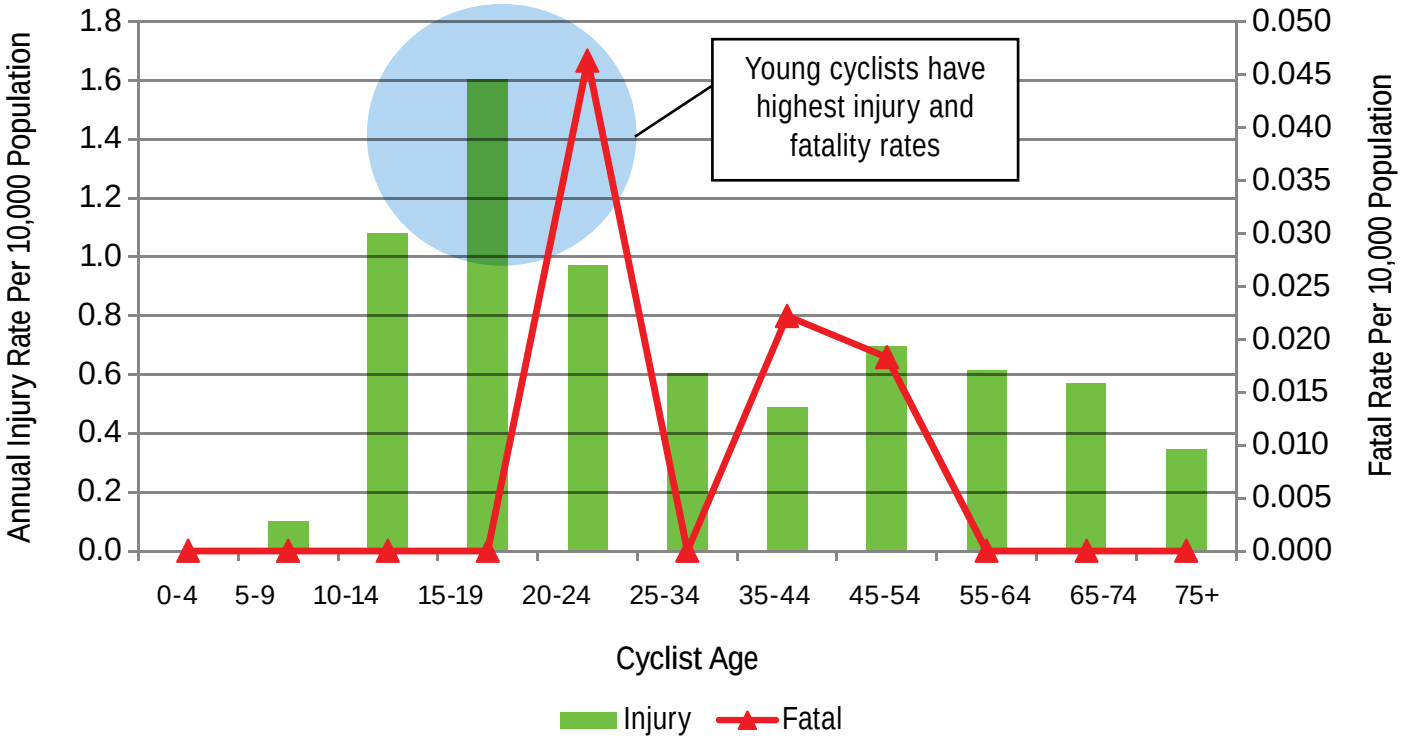


*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Cyclist collisions generally follow traffic volume trends, similar to pedestrians, with peaks generally in the a.m. and p.m. peak period on weekdays and mid-day on weekends.

Age Profile

AGE OF INJURED OR FATALLY INJURED CYCLISTS, 2018-2020



*The collision data is from YRP MVC reports
*The population data is from Statistics Canada

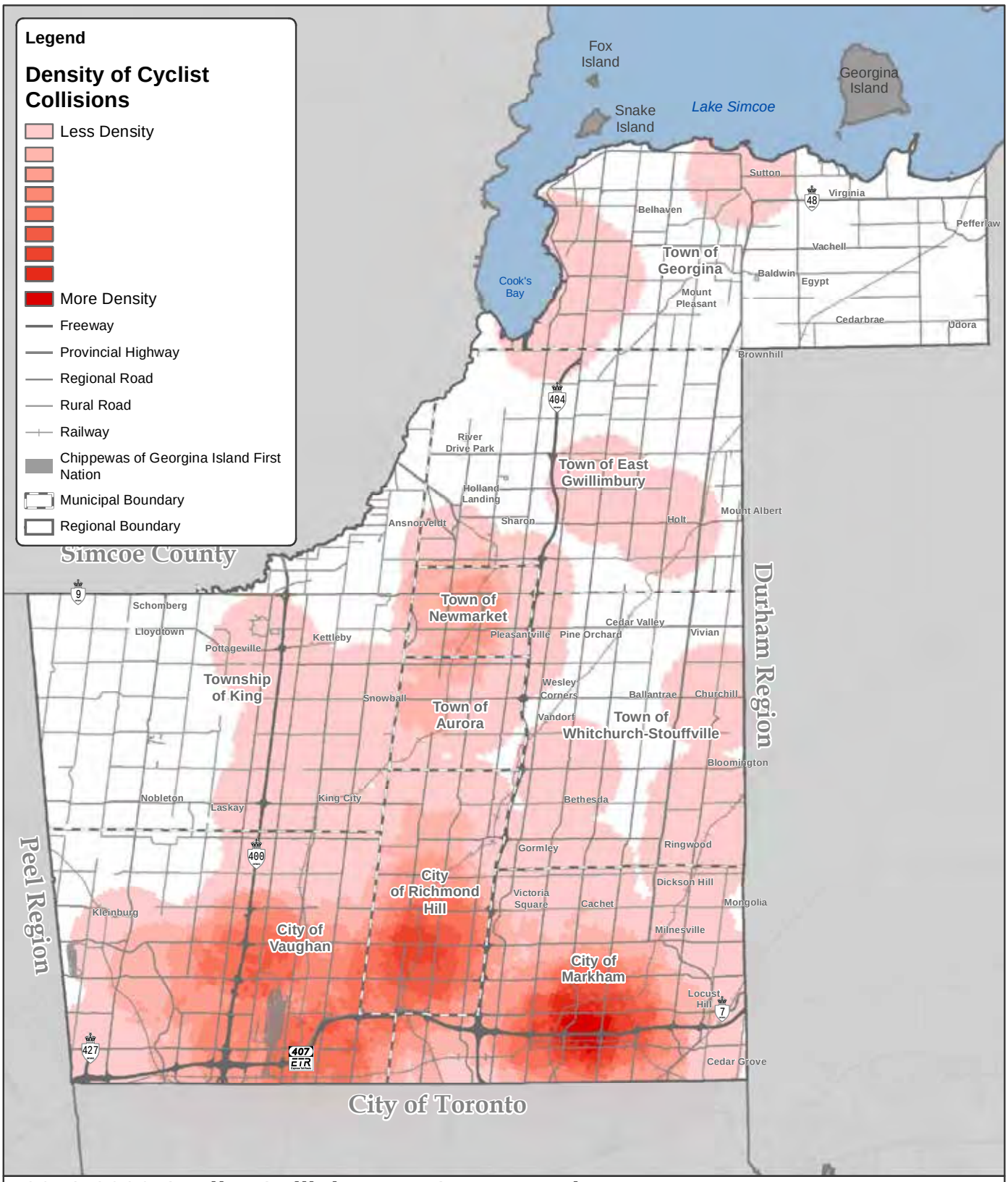
As shown in the figure above, cyclists 15 to 19 years of age are most likely to get injured while the 20 to 24 cyclist age group has the highest fatality rate in a collision. These two age groups are similar to those pedestrian age groups associated with high injury risks. Measures and campaigns benefitting pedestrian safety can improve cyclists' safety as well.

Cyclist Collision Locations

Most cyclist collisions occur at intersections with traffic signals

Cyclist collisions are more likely to occur at signalized intersections, making up more than 82% of all cyclist collisions, as intersection locations have high cyclist presence and a high occurrence of conflict points between motor vehicles and cyclists. A collision density map showing the locations of all reported cyclist collisions on Regional roads from 2018 to 2020 is illustrated on the next page.

82% OF ALL CYCLIST COLLISIONS OCCUR AT SIGNALIZED INTERSECTIONS.



2018-2020 Cyclist Collision Hot Spot Locations Map

2021 Annual Collision Statistics Report

0 5 10 km

York Region

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Transportation and Infrastructure Planning
Transportation Services

The Top 10 cyclist collision locations based on 10-year totals are listed in the following table:

TOP 10 HIGHEST CYCLIST COLLISION FREQUENCY LOCATIONS, 10-YEAR TOTAL, 2011-2020

Location	Municipality	10-Year Injury Cyclist Collisions	10-Year Total Cyclist Collisions
14th Avenue and Markham Road	Markham	9	9
**Dufferin Street and Glen Shields Avenue	Vaughan	5	9
**Kennedy Road and Denison Street	Markham	5	7
**Kennedy Road and 14th Avenue	Markham	5	7
Major Mackenzie Drive West and Highway 400 NB Off-Ramp	Vaughan	4	7
**Kennedy Road and Clayton Drive	Markham	6	6
**Dufferin Street and Centre Street	Vaughan	6	6
Kirkham Drive/Highglen Avenue and Markham Road	Markham	5	6
**Dufferin Street and Clark Avenue West	Vaughan	5	6
Yonge Street and Mulock Drive	Newmarket	5	5
**Kennedy Road and Highway 407 EB Off-Ramp	Markham	5	5
McCowan Road and Carlton Road/Raymerville Drive	Markham	5	5

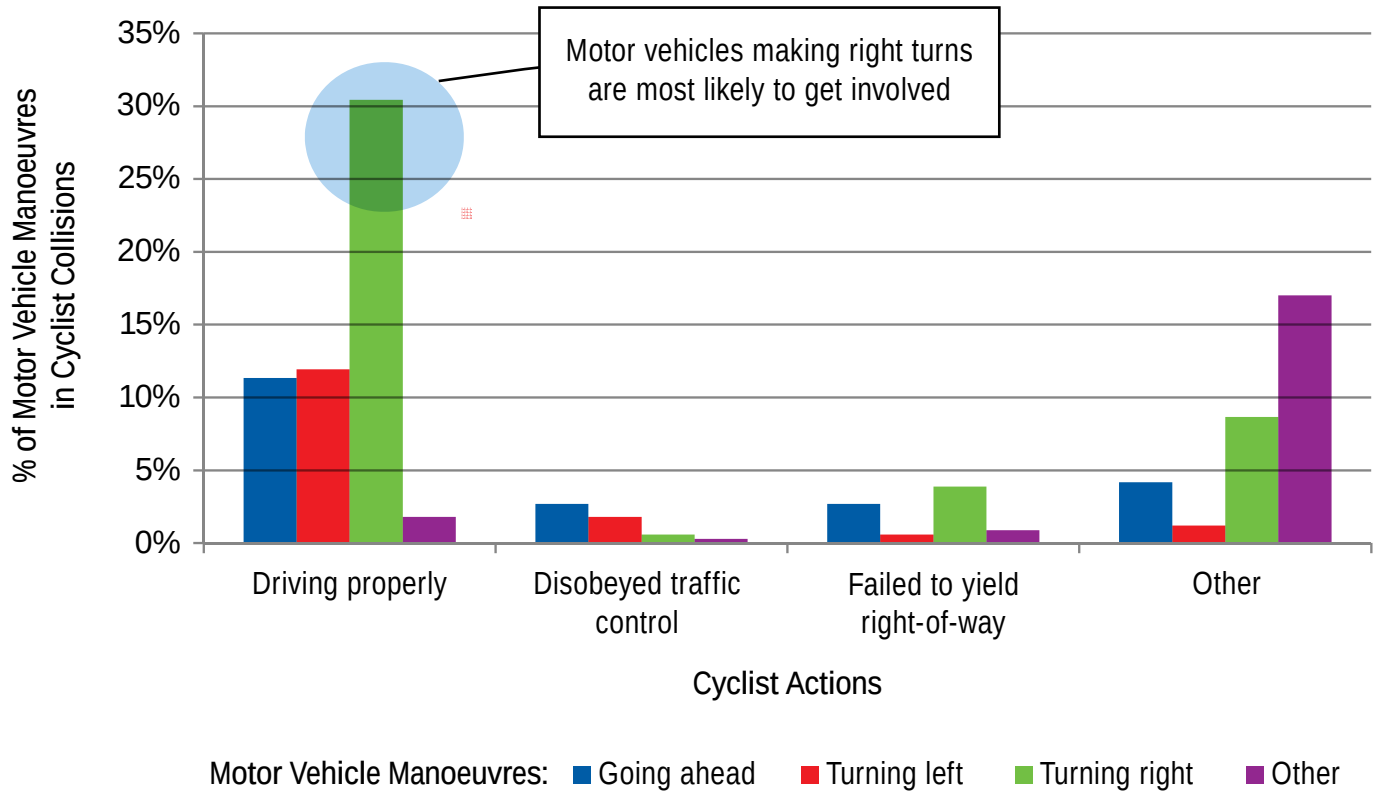
*The collision data is from YRP MVC reports
**An independent road safety audit is being undertaken on Kennedy Road from Steeles Avenue to Highway 7 and Dufferin Street from Glen Shields Avenue to Centre Street to improve safety

Driver and Cyclist Actions

Improper driver action is the main cause of cyclist collisions

Cyclist collisions were found to be predominantly attributed to improper driving action. Cyclists were considered at-fault in only 27% of all cyclist collisions. Of all cyclist collisions resulting from improper motor vehicle action, 61% were a direct cause of drivers failing to yield right-of-way; 17% resulted from drivers making improper turns. Cyclists failing to yield right-of-way is the top cyclist at-fault actions (26%).

MOTOR VEHICLE MANOEUVRES IN CYCLIST COLLISIONS



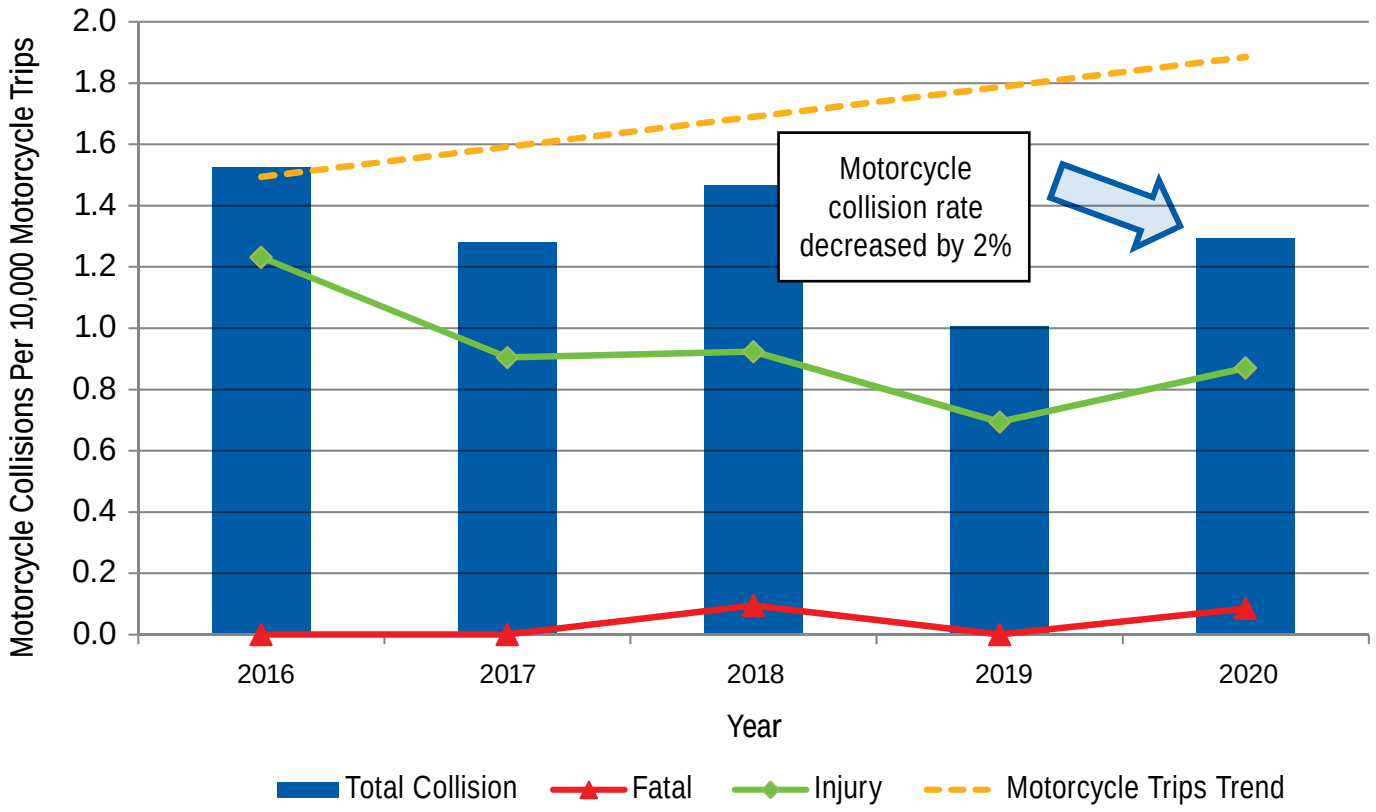
*The collision data is from YRP MVC reports

Overall, 51% of cyclist collisions involve vehicles making right turns and only 18% involve left-turn vehicles. Most of these collisions occur when cyclists are crossing with right-of-way. For the collisions where cyclists fail to yield right-of-way, right-turn vehicles are also more likely to get involved than going-ahead or left-turn vehicles.

OVERALL, 51% OF CYCLIST COLLISIONS INVOLVE VEHICLES MAKING RIGHT TURNS.

Motorcyclists ↓ 2%

MOTORCYCLE COLLISION RATES, 2016-2020



*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies. 2020 trip adjustment based on data collected during pandemic

Travel by motorcycle is growing in popularity

As the sales of new motorcycle units in Canada increased by 11% in 2020, motorcycle trips, especially those for recreation, are likely to increase during the COVID-19 pandemic. The motorcycle collision rate in 2020 is 2% lower than the average of 2016-2019.

MOTORCYCLE COLLISION RATES HAVE DECREASED BY 2% IN 2020.

Fatal collision rates have stayed at a very low level but injury collision rates increased by 21%. Similar to pedestrians and cyclists, motorcyclists are vulnerable road users as they are unprotected by a shell and metal frame of four-wheeled vehicles. While 24% of motor-vehicle only collisions resulted in injuries or fatalities, 71% of motorcycle collisions resulted in injuries or fatalities.

Key trends observed:

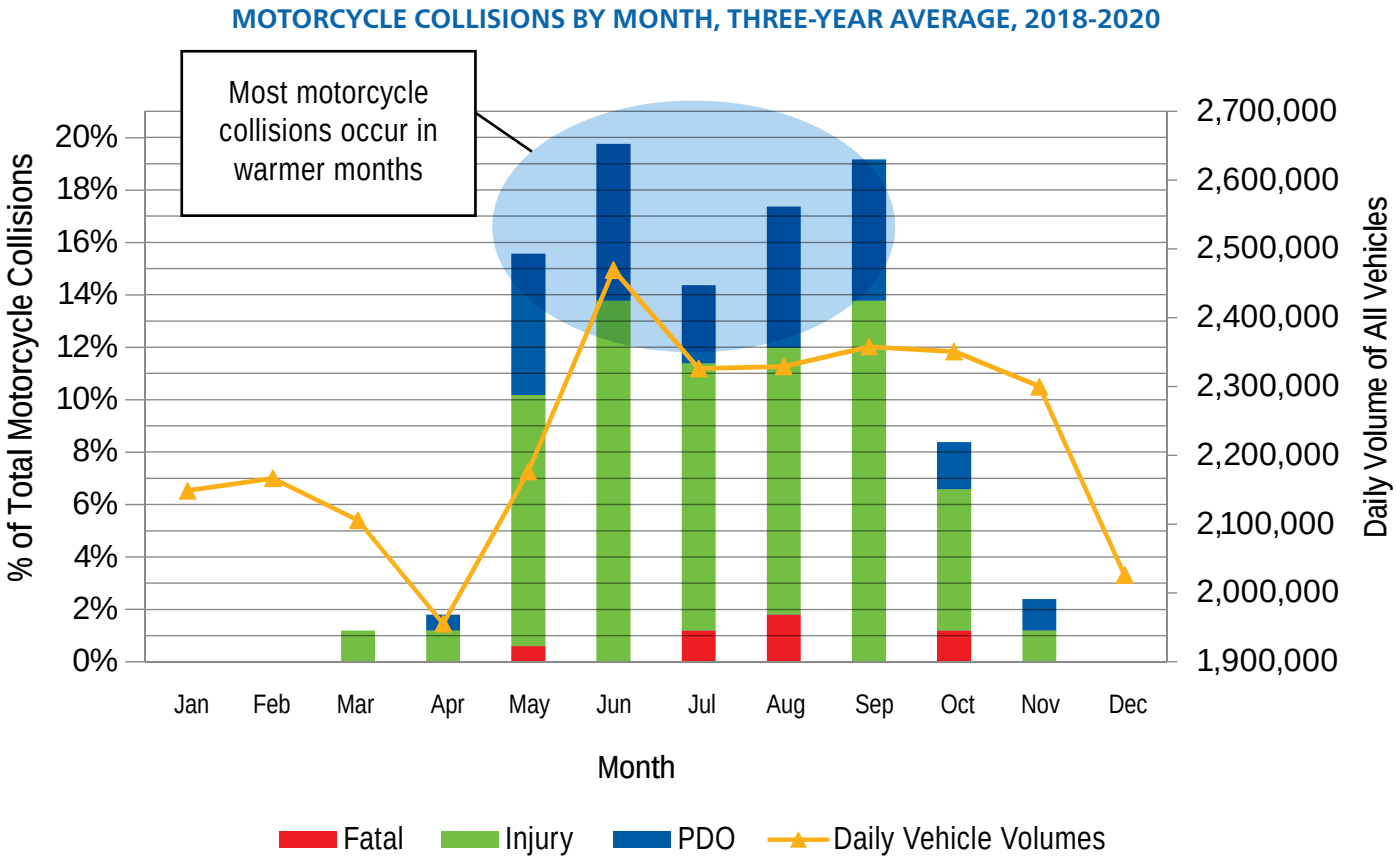
- Although the traffic volume on Regional roads has reduced by about 20-50% in 2020 due to Public Health restrictions related to the COVID-19 pandemic, it is likely recreational trips by motorcycles that has increased, resulting in an increased motorcycle collision rate by 28%.
- Most motorcycle collisions occur in the warmer months of the year; weekdays and weekends have similar levels of daily motorcycle collisions, and late night hours may be associated with increased motorcycle collision risk
- In multi-vehicle collisions involving motorcyclists, the drivers of the other vehicles are more likely to be at-fault (56%)
- Motorcyclists are at higher risk to be involved in single vehicle collisions, mostly due to losing control of their motorcycles.

The Region continues to put measures in place to address motorcycle safety including:

- YRP and York Region motorcycle safety and awareness programs in the spring and summer months

Motorcycle Collisions by Month, Day and Time

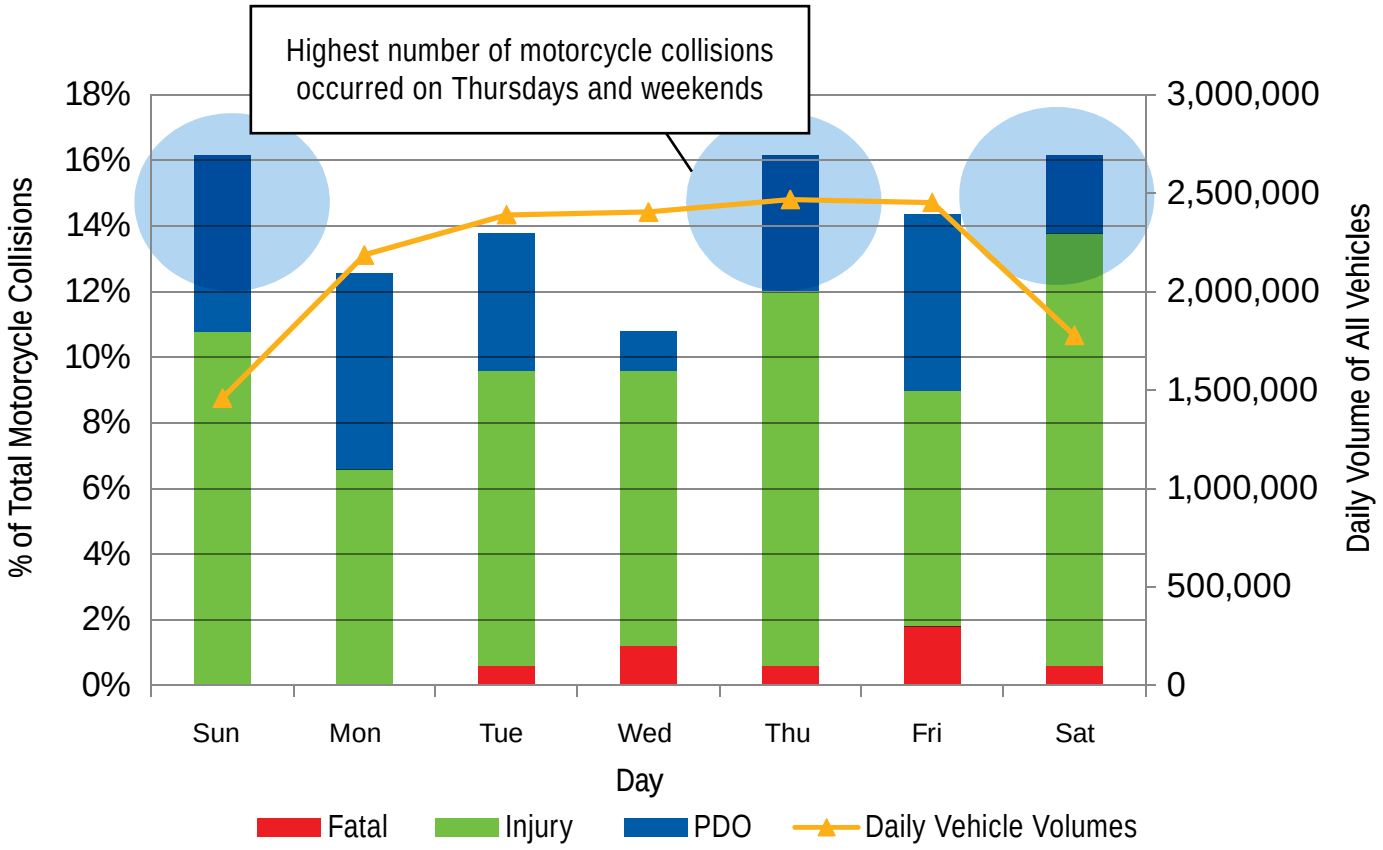
The majority of motorcycle collisions, 86%, occurred May to September, which are the warmer months of the year and associated with motorcycle activities.



**The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

The daily number of motorcycle collisions on weekends is only slightly higher than that of weekdays. This implies motorcycle trips are likely to be evenly distributed among all days of the week, while auto-vehicle volumes are significantly lower during weekends.

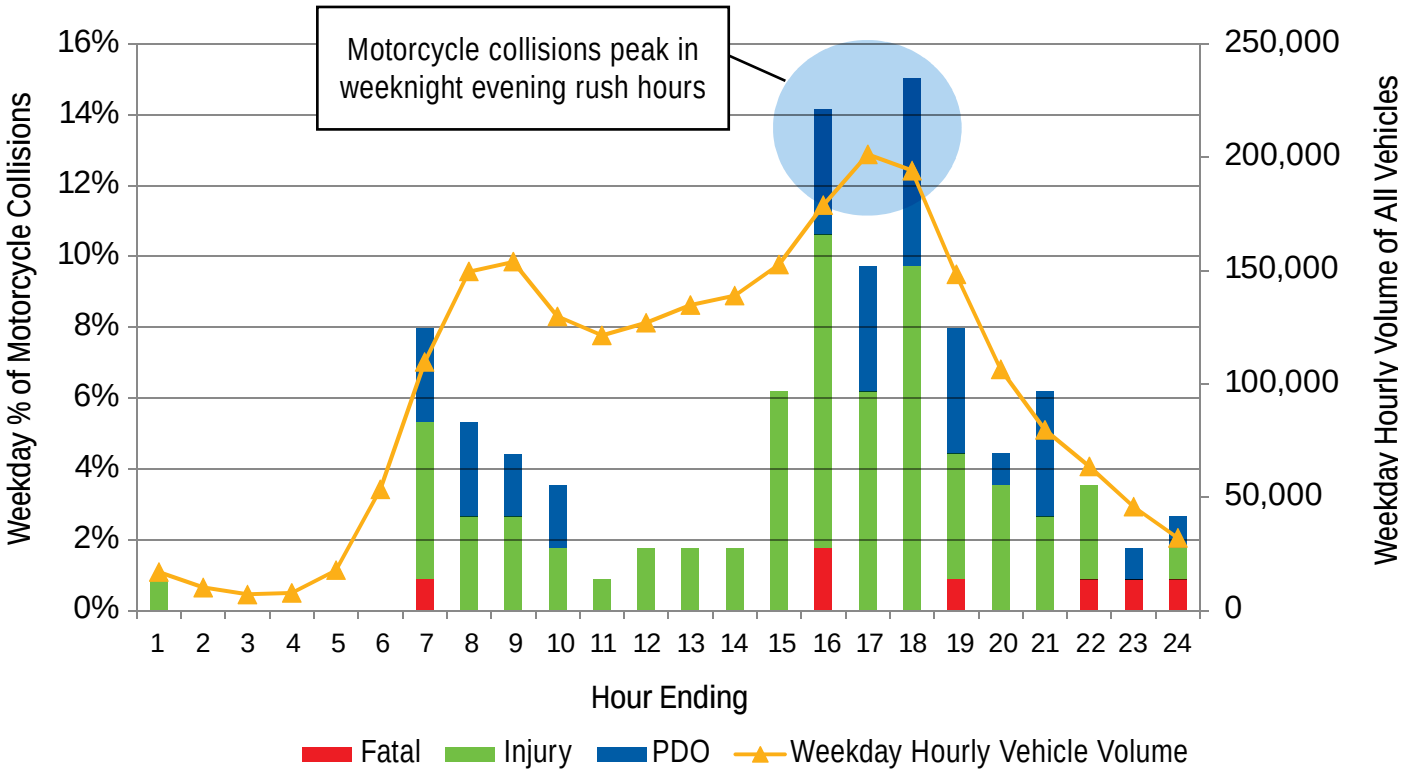
MOTORCYCLE COLLISIONS BY DAY-OF-WEEK, THREE-YEAR AVERAGE, 2018-2020

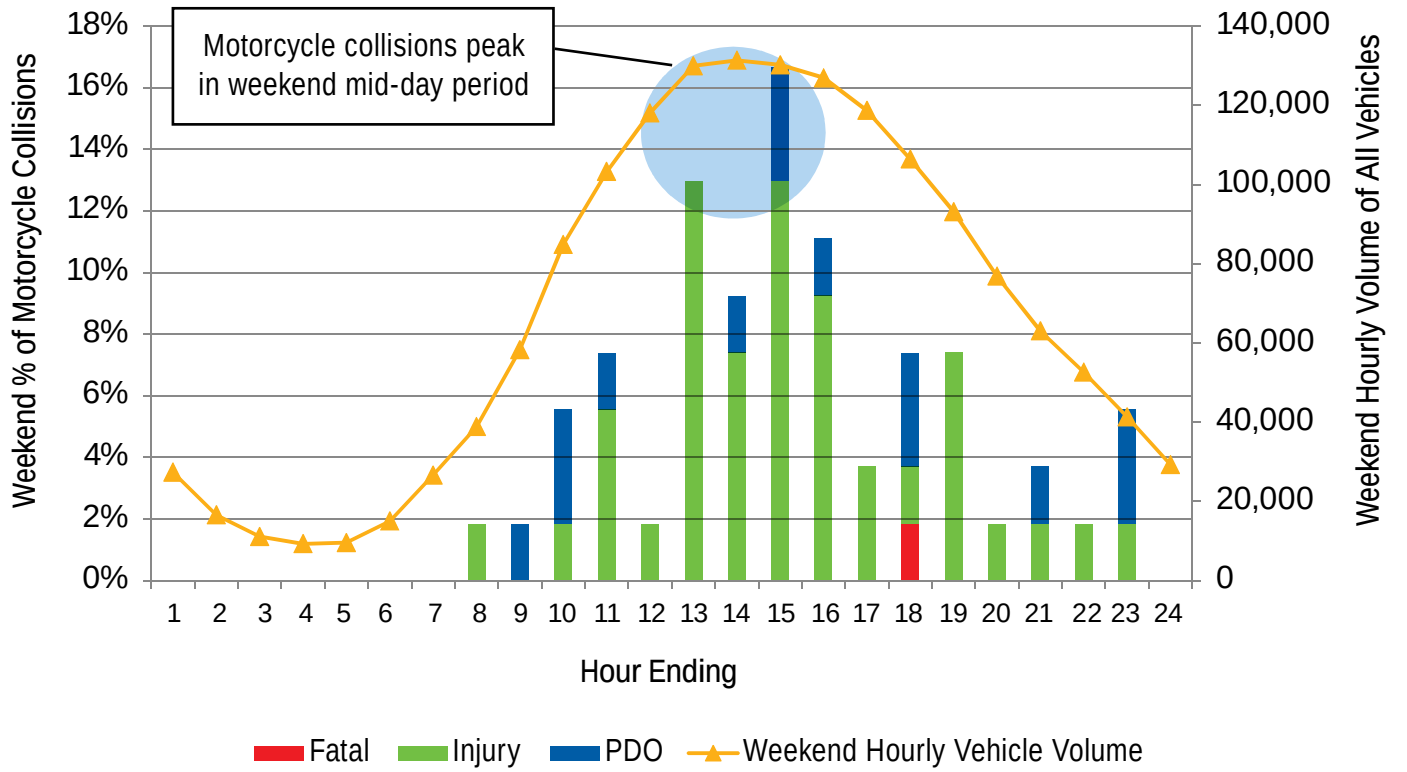


*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Motorcycle collisions generally follow daily traffic volume, with peaks in morning and evening rush hours on weekdays and mid-day on weekends. It is worth noting that motorcycle collisions slightly spike during 11 p.m. to 12 a.m. on weeknights, and 10 p.m. to 11 p.m. on weekends, which could be due to late night hours and behaviours with higher risk.

MOTORCYCLE COLLISIONS BY TIME-OF-DAY, THREE-YEAR AVERAGE, 2018-2020

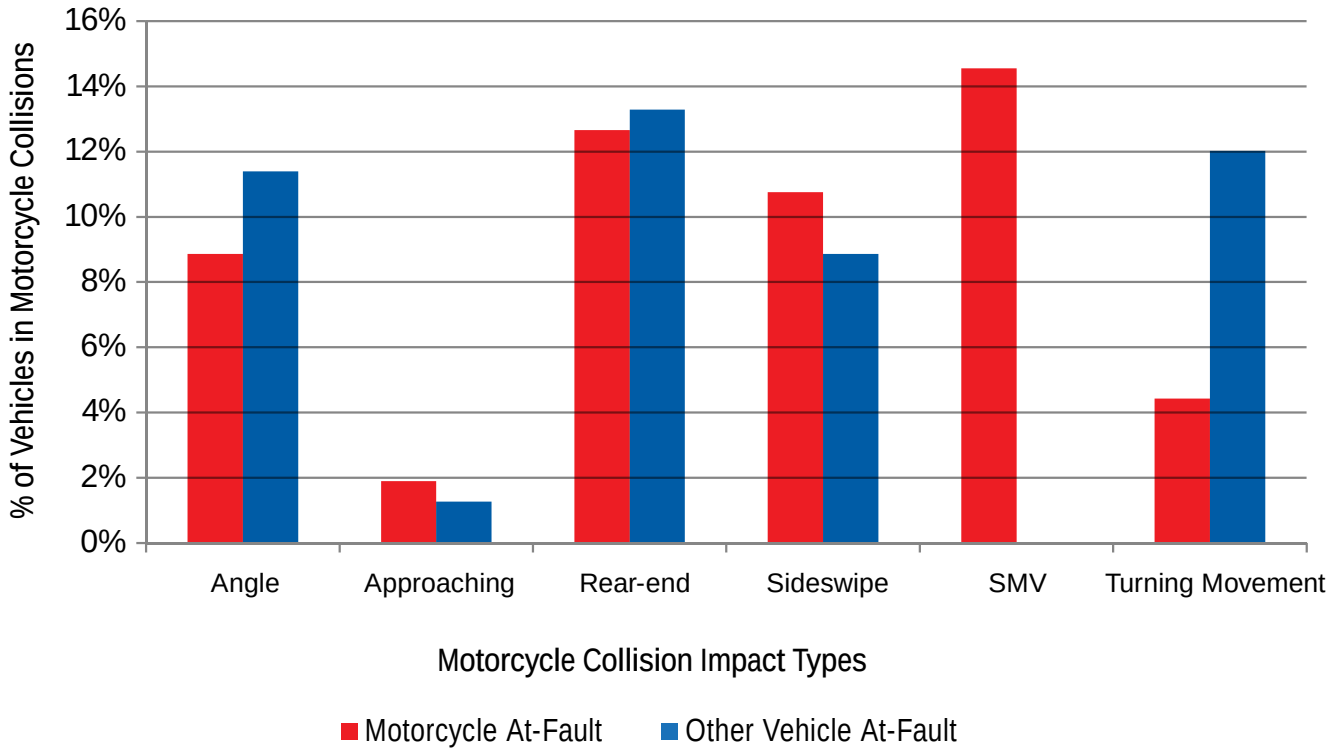




*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Driver Actions and Impact Types

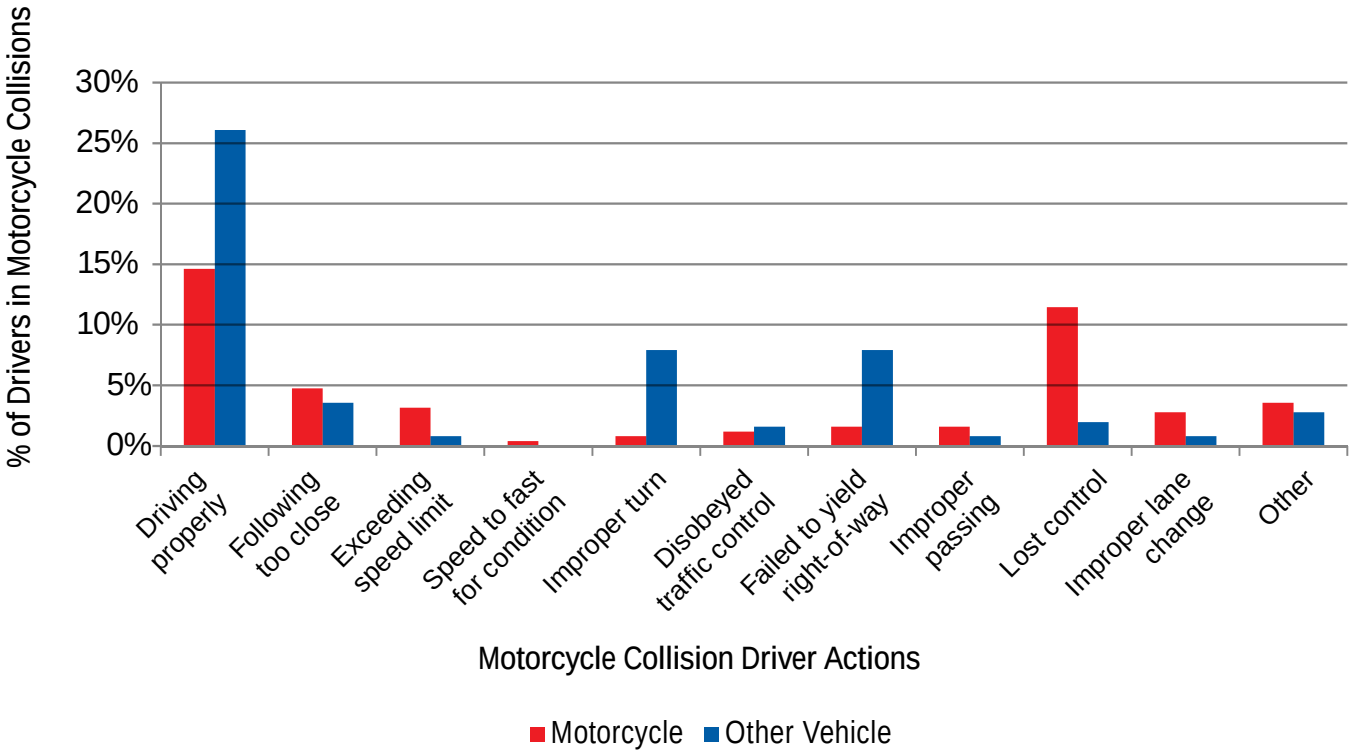
MOTORCYCLE COLLISION IMPACT TYPES AND DRIVER ACTIONS



**The collision data is from YRP MVC reports

Motorcycles are relatively small and the rider's view of drivers of other vehicles is more easily obstructed. In addition, motorcycle actions are more difficult to predict than other types of vehicles due to their manoeuverability. This explains why other types of vehicles are more likely (56%) to be at-fault in motorcycle collisions. Motorcyclists tend to cause single motor vehicle collisions when they lose control of their motorcycles. The most common driver error made by other vehicles is improper turn, followed by failing to yield right-of-way.

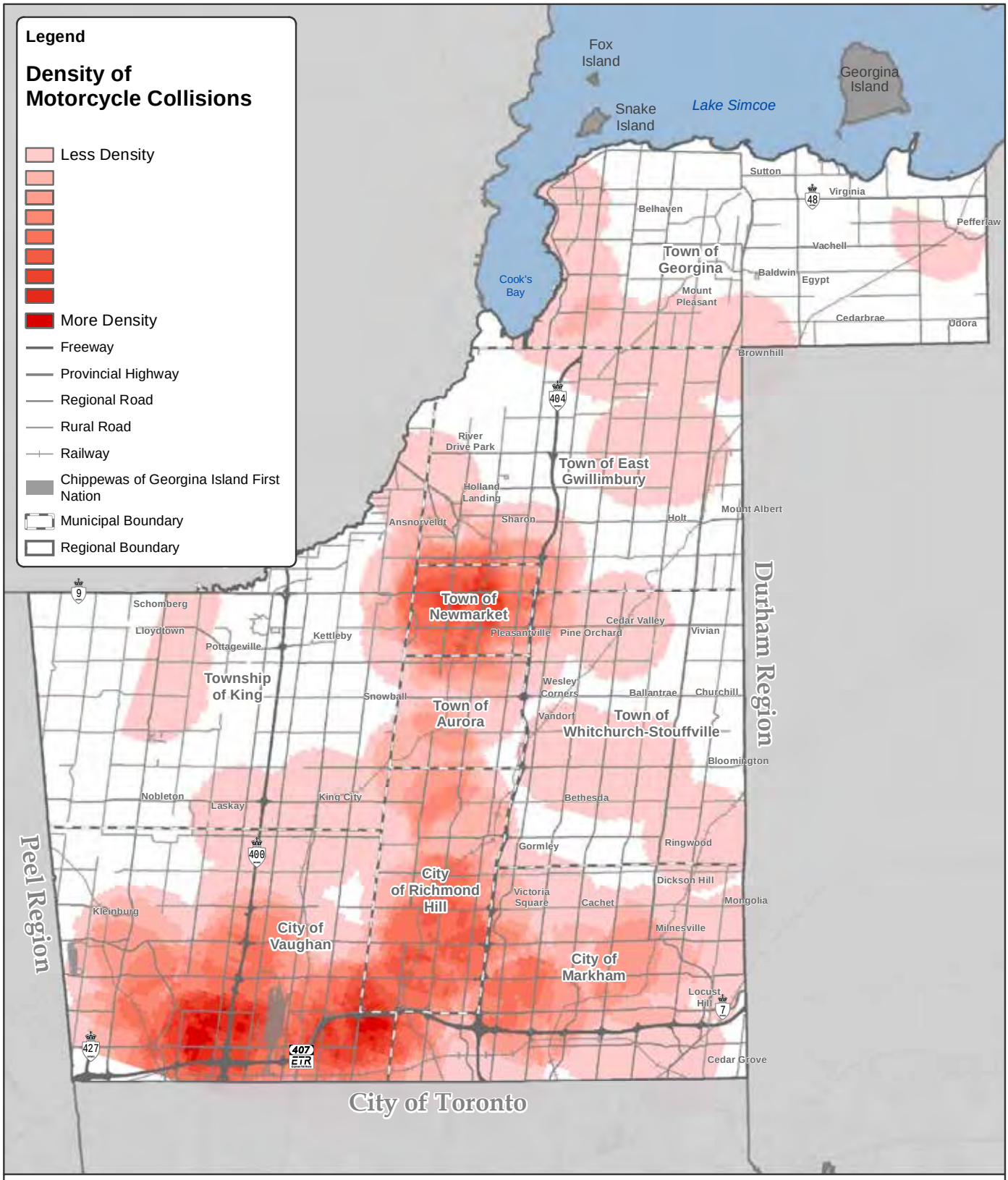
DRIVER ACTIONS IN MOTORCYCLE COLLISIONS



* The collision data is from YRP MVC reports

Motorcycle Activity and Collision Locations

A collision density map on the next page shows the location of all reported motorcycle collisions on Regional roads from 2011 to 2020.



2018-2020 Motorcycle Collision Hot Spot Locations Map

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0 5 10 km

York Region

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The Top 10 motorcycle collision locations based on a 10-year total are listed in the following table:

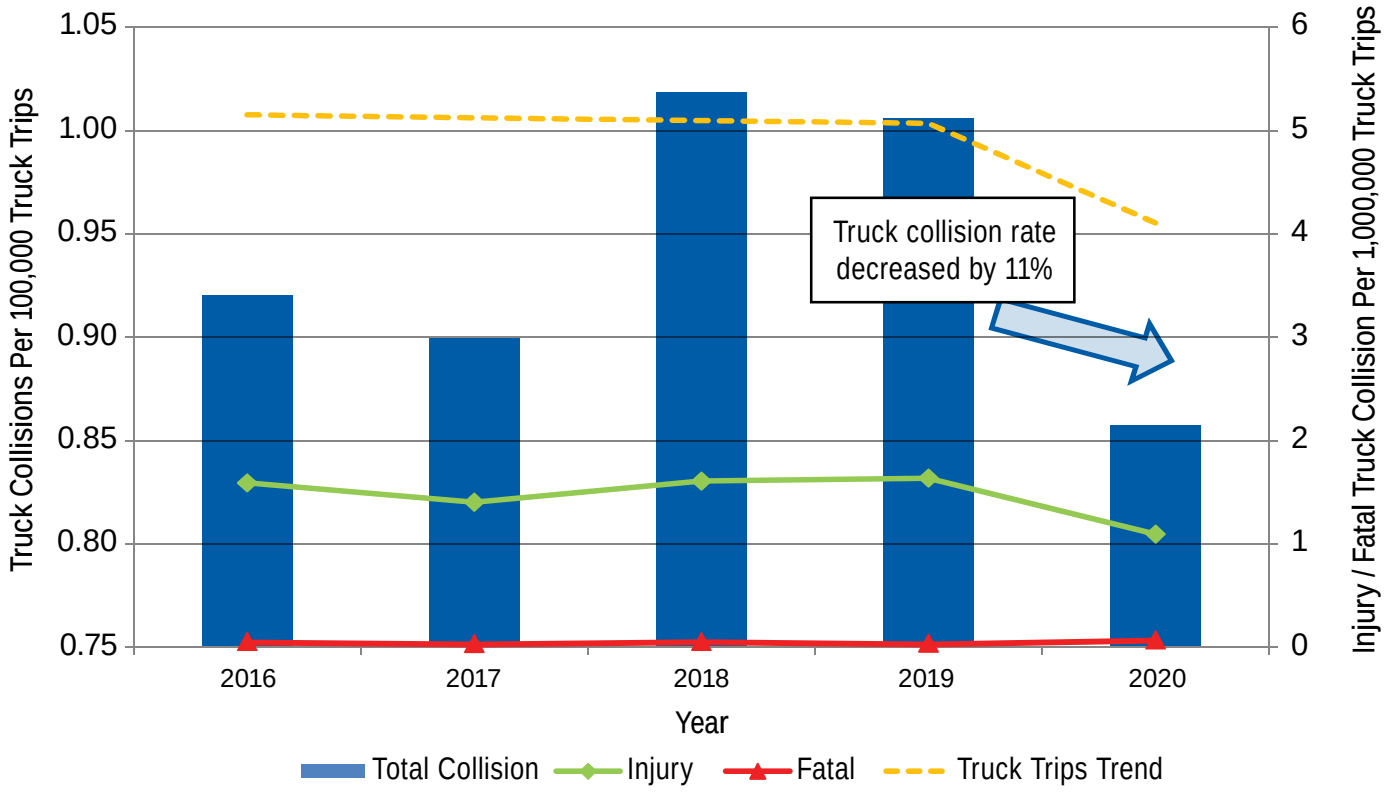
TOP 10 HIGHEST MOTORCYCLE COLLISION FREQUENCY LOCATIONS, 10-YEAR TOTAL, 2010-2019

Location	Municipality	10-Year Injury Motorcycle Collisions	10-Year Total Motorcycle Collisions
Davis Drive West and Bathurst Street	King/ Newmarket	5	6
Keele Street and Highway 7	Vaughan	5	6
16th Avenue and Main Street Markham North/Highway 48	Markham	5	6
Highway 7 and Vaughan Valley Boulevard	Vaughan	3	5
Highway 7 and Warden Avenue	Markham	2	5
Yonge Street and Carrville Road/16th Avenue	Richmond Hill	1	5
Highway 7 and Leslie Street	Markham	3	4
Highway 27 and Rutherford Road	Vaughan	3	4
Teston Road and Cityview Boulevard	Vaughan	3	3
Islington Avenue and Kiloran Avenue	Vaughan	3	3

*The collision data is from YRP MVC reports

Trucks ↓ 11%

TRUCK COLLISION RATES AND PROPORTIONS, 2016-2020



*The collision data is from YRP MVA reports
*The number of trips is based on TTS study data

Based on research, Canada operated at approximately 84% of normal commercial transportation activity in 2020 due to the COVID-19 pandemic. Truck traffic volume in York Region during 2020 is estimated to have had a similar level of decrease.

24% OF MOTOR VEHICLE COLLISIONS RESULTED IN INJURIES OR FATALITIES, WHILE ONLY 16% OF COLLISIONS INVOLVING TRUCKS RESULTED IN INJURIES OR FATALITIES.

The truck collision rate in 2020 is 11% lower than the average of the previous four years, as shown in above figure. Fatality rates remain at low levels and injury collision rates decreased slightly in 2020. Sideswipe collisions were the most predominant collision type for trucks at 40%.

Over the past 10 years, fatal truck collision rates have remained at a very low level, and injury truck collision rates were also stable. The percentage of truck collisions among all collisions increased from 6.0% in 2016 to 7.8 % in 2020, possibly because other types of collisions decreased due to restrictions related to the COVID-19 pandemic. While 24% of motor vehicle only collisions resulted in injuries or fatalities, only 16% of truck collisions caused injuries or fatalities.

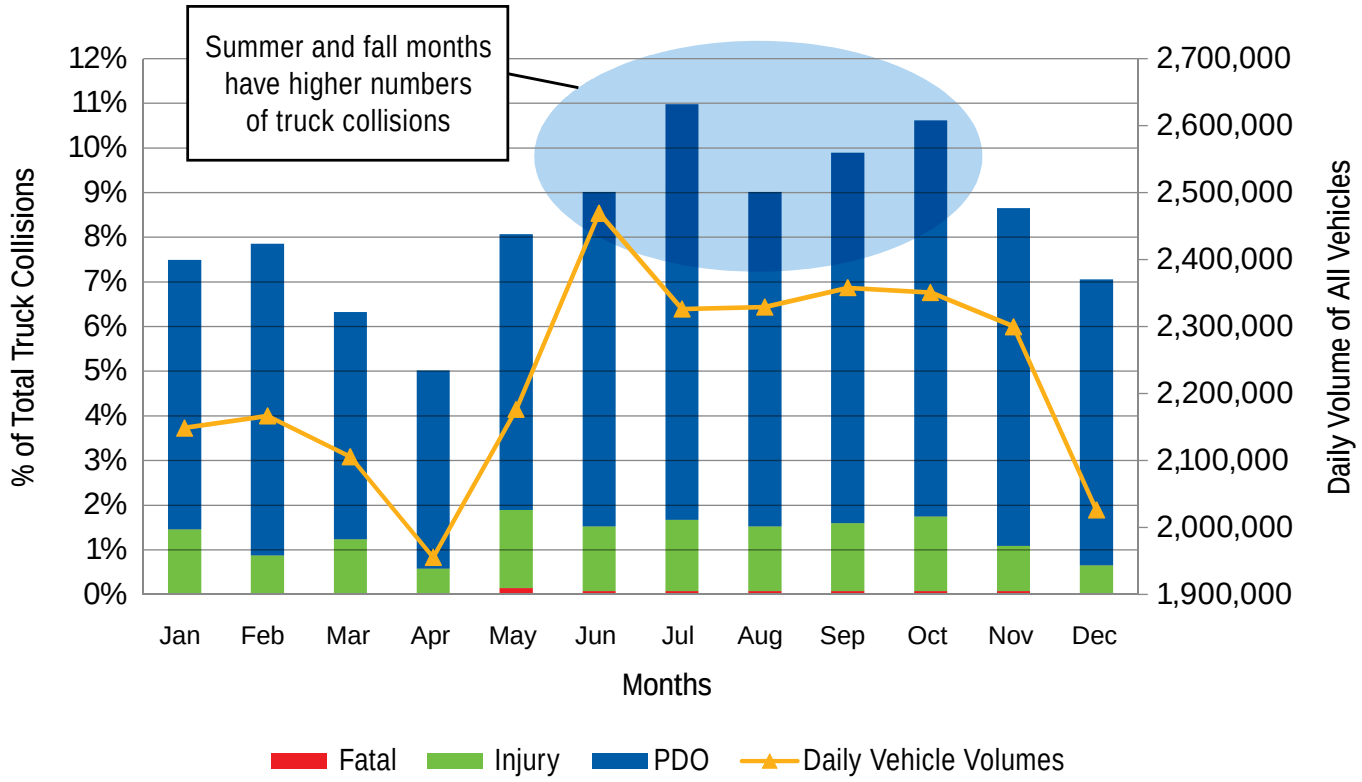
Key trends observed:

- Truck collision rate in 2020 was 11% lower than the average of the previous four years
- There were more truck collisions in summer and fall than in winter and spring, and predominantly occurred on weekdays
- Weekday truck collisions occurred mostly during daytime without obvious a.m. or p.m. peaks, likely that commercial truck trips are distributed more evenly during daytime compared to common commuter trips
- Sideswipe collisions were the most predominant collision type for trucks at 20%
- Trucks were more likely to rear-end other vehicles, while the top at-fault action for other vehicles was sideswiping trucks
- More than half of truck traffic and collisions occurred in the City of Vaughan where trucking distribution centres are predominant
- The road segments connecting Regional major trucking destinations to major Provincial highways (Hwy. 400, 401, 404, 407 and 427) were associated with the highest truck volumes and truck collision risks

Truck Collisions by Month, Day and Time

The highest number of truck collisions occurred in July. In June to October, there were higher numbers of truck collisions than other months, which is due to the high vehicle volumes on roads.

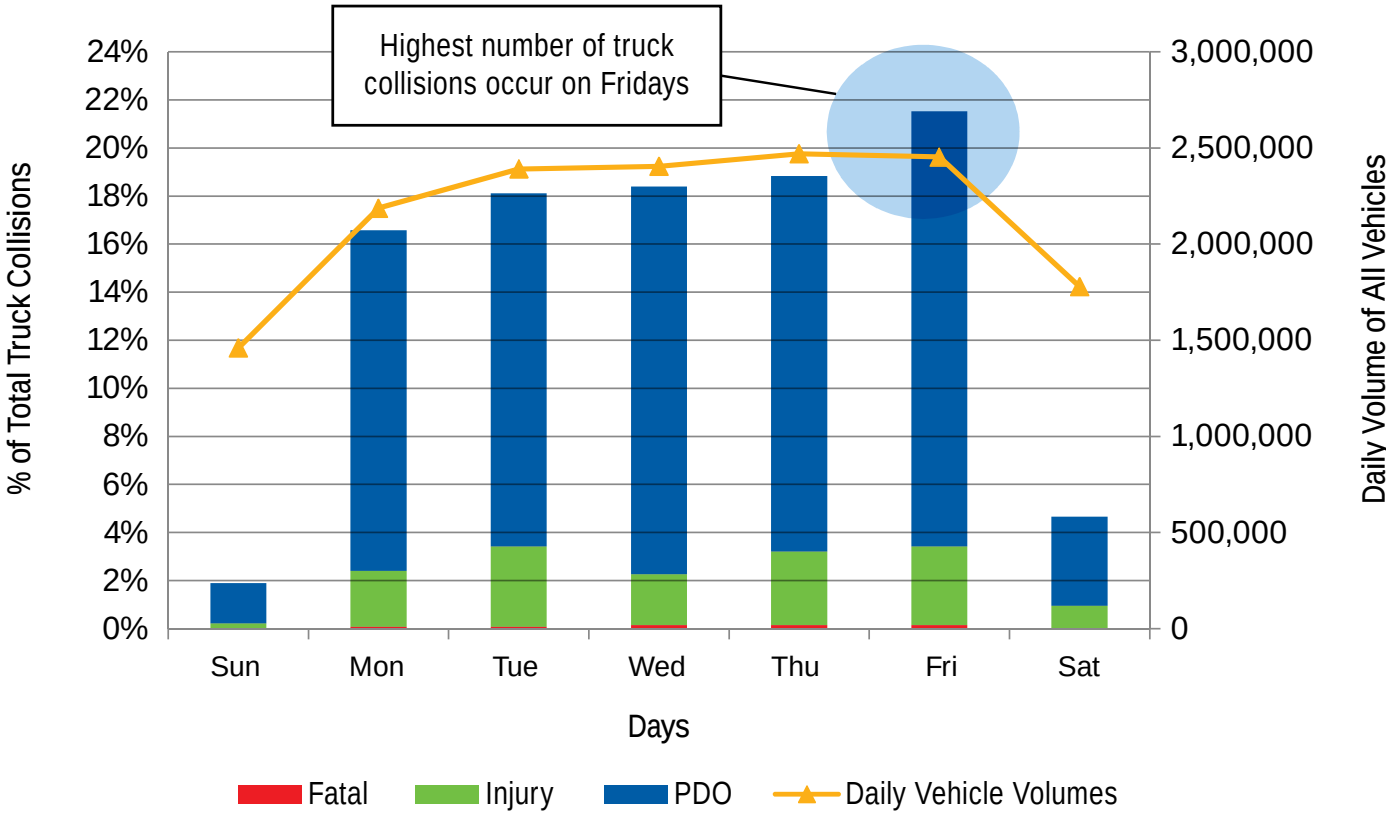
TRUCK COLLISIONS BY MONTH, THREE-YEAR AVERAGE, 2018-2020



*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

The number of truck collisions peak on Fridays and 93% of truck collisions occurred on weekdays, which are associated with most commercial trucking activities.

TRUCK COLLISIONS BY DAY-OF-WEEK, THREE-YEAR AVERAGE, 2018-2020

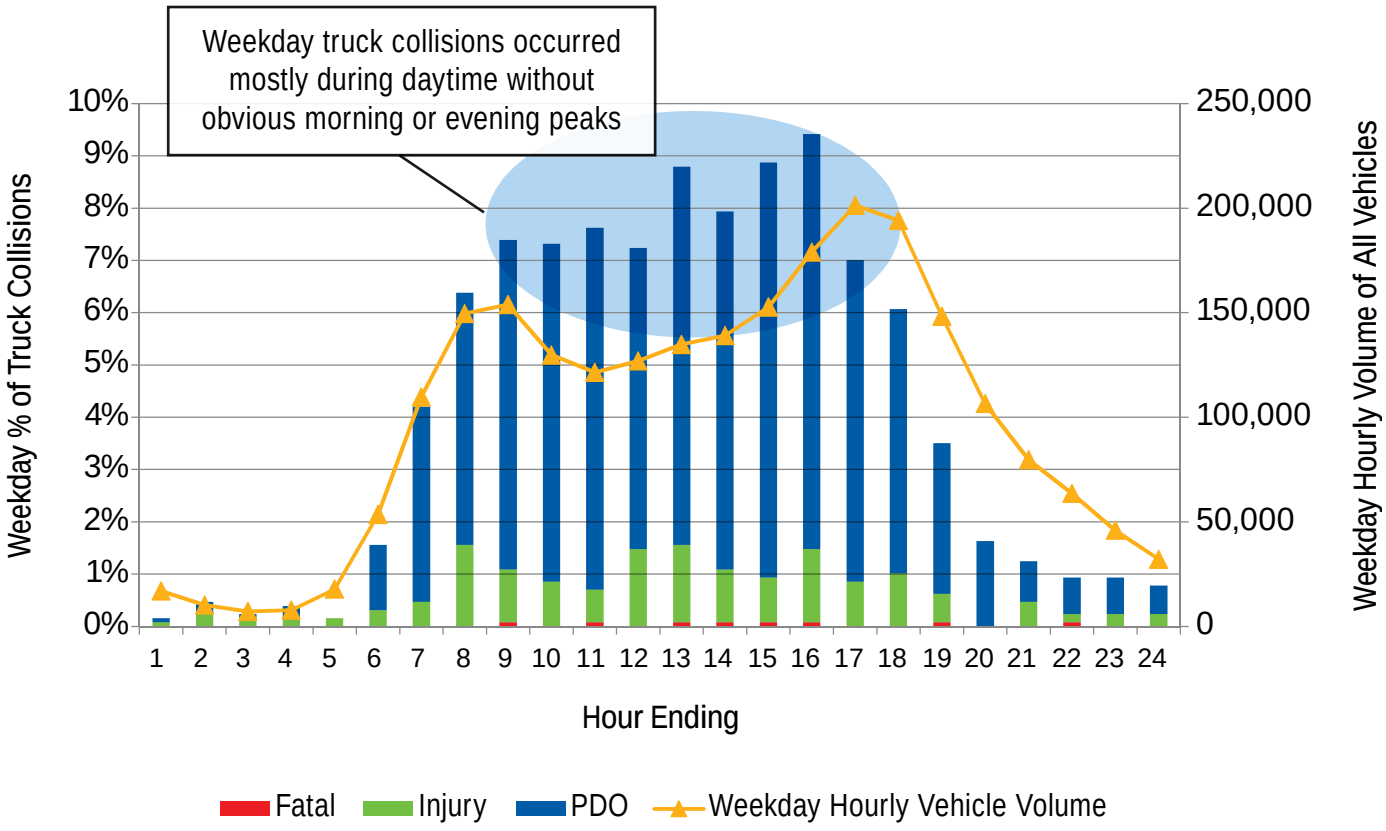


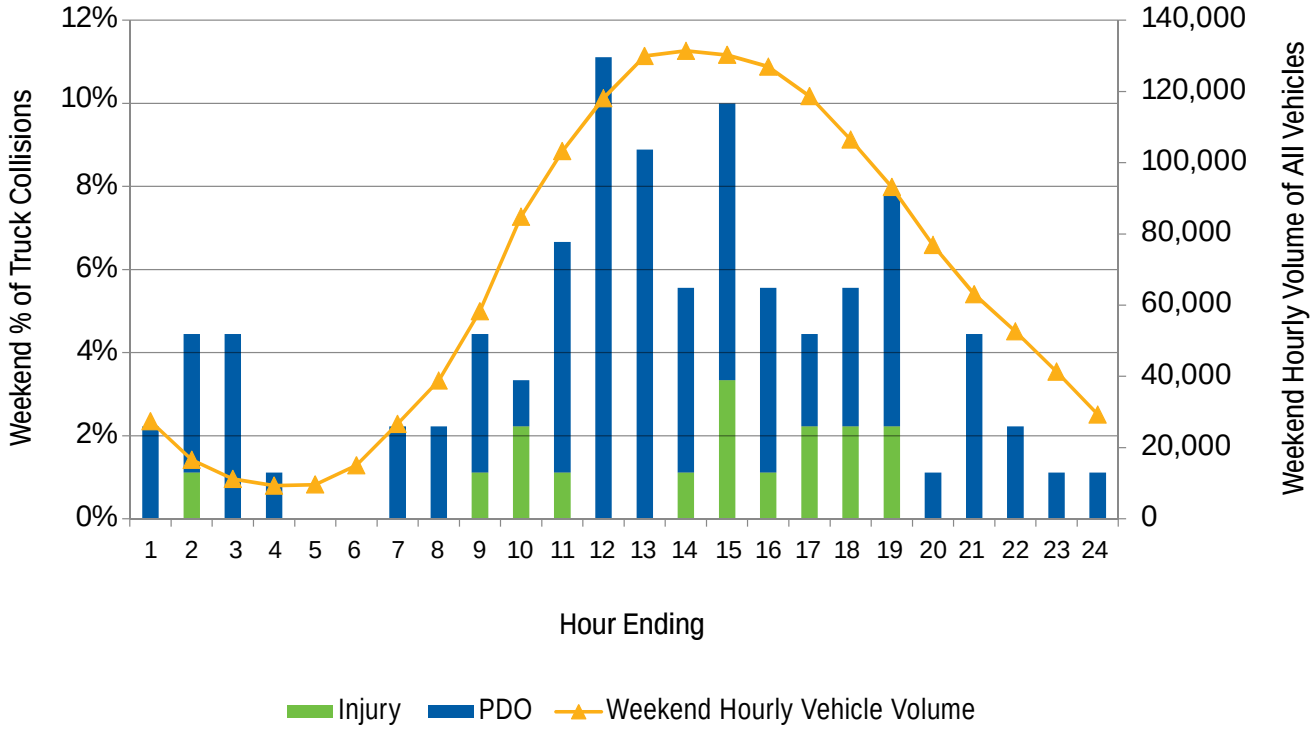
*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

During weekdays, truck collisions mostly occur during the 7 a.m. to 7 p.m. period, without obvious a.m. or p.m. peaks, which implies that commercial truck trips are different from common commuting trips in that they are distributed more evenly during daytime.

On weekends, truck collision distribution generally follows traffic volumes, with a spike in early morning (12 a.m. to 3 a.m.).

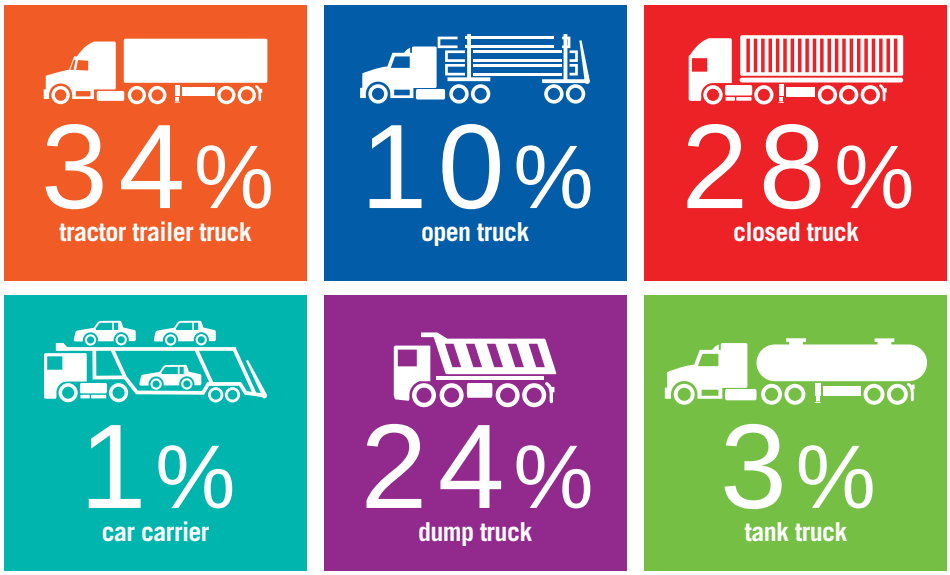
TRUCK COLLISIONS BY TIME-OF-DAY, THREE-YEAR AVERAGE, 2018-2020





*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

TRUCK TYPES INVOLVED IN COLLISIONS (2011-2020)



*The collision data is from YRP MVC reports

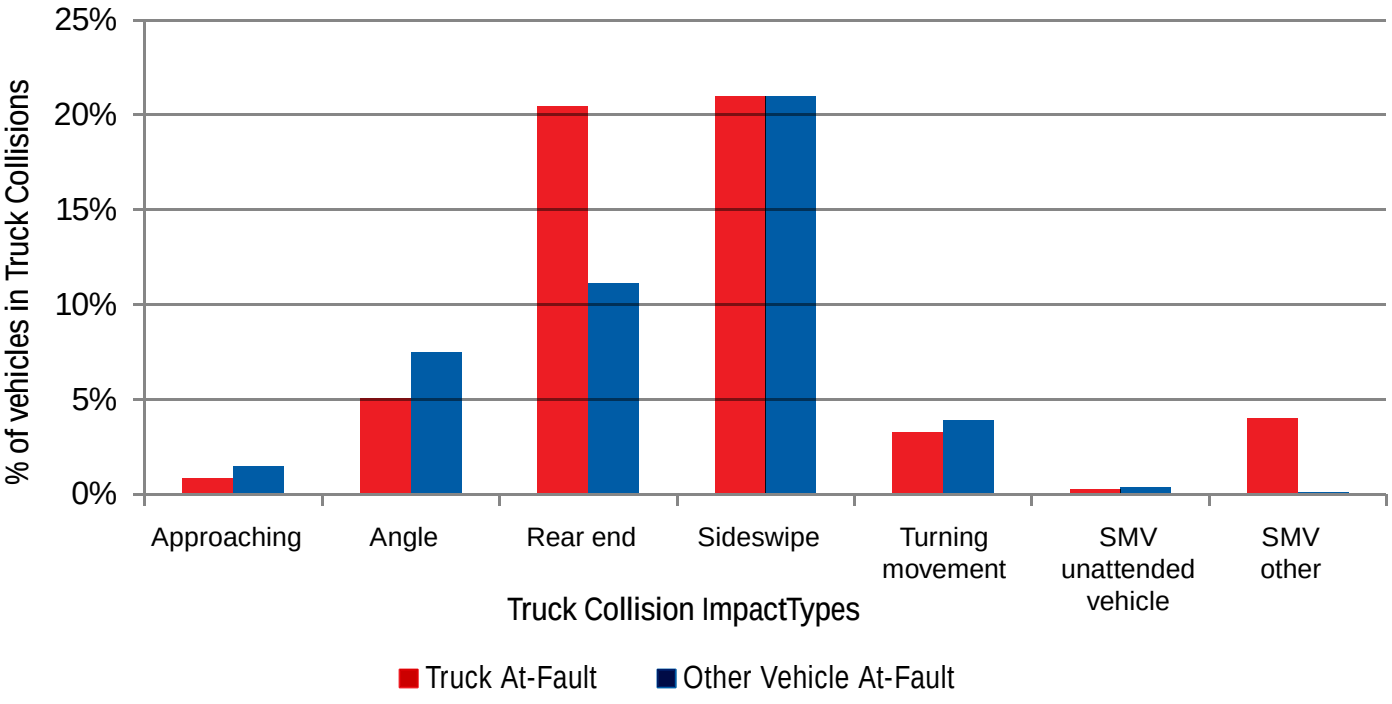
Truck Collision Impact Types

Trucks need more space

The most common collision types involving trucks are sideswipe (40%) and rear-end (30%). Trucks are much longer than other vehicles, move slower and require more space. Truck drivers also require more reaction time, which is evidenced in the case of rear-end collisions, when the truck driver is more often at fault for following too close. In sideswipe collisions, the chance of being at-fault is similar for truck and motor vehicle drivers.

40% OF COLLISIONS INVOLVING TRUCKS ARE SIDESWIPE COLLISIONS.

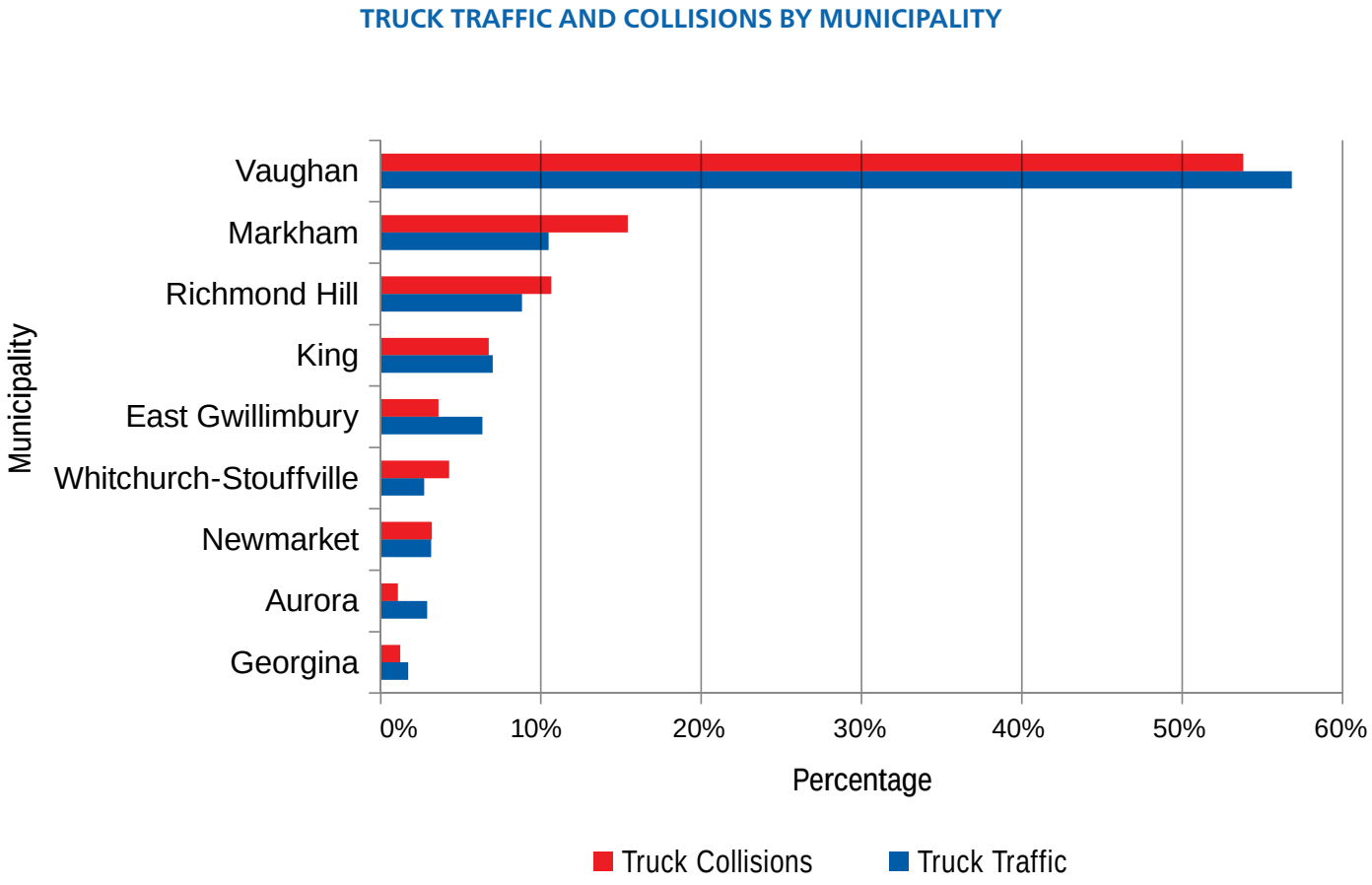
TRUCK COLLISION IMPACT TYPES AND DRIVER ACTIONS



*The collision data is from YRP MVC reports

The number of at-fault trucks and other vehicles involved in truck collisions are close. The top at-fault truck driver action is following too close, which accounts for 26% of total truck driver at-fault actions. The top at-fault action of other vehicles is improper lane change, which accounts for 20% of total other vehicle at-fault actions.

Truck Activity and Collision Locations



*The collision data is from YRP MVC reports
*Truck traffic data is from MTO 2016 Commercial Vehicle Study

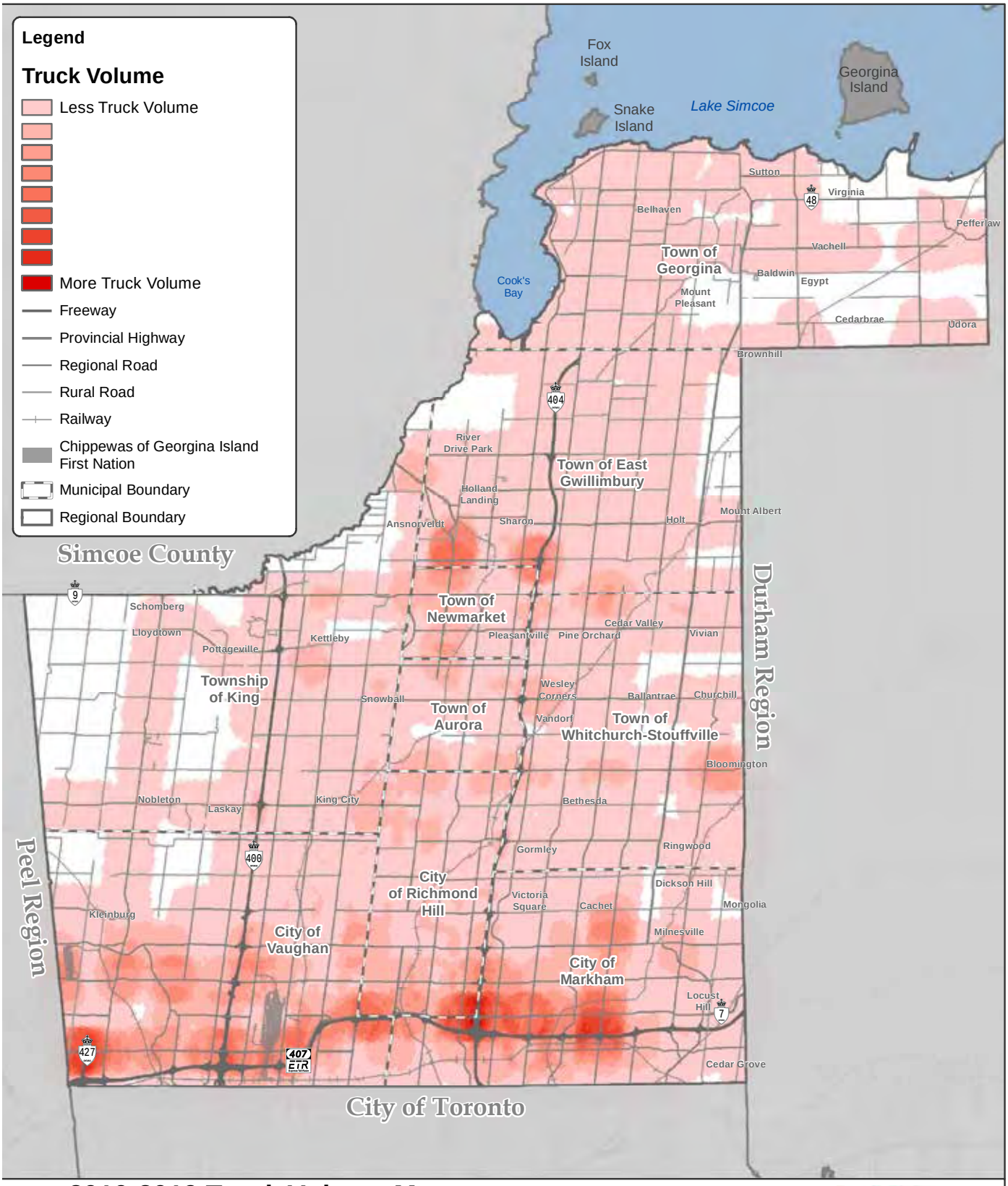
The above figure shows that truck activities and numbers of collisions are proportionally correlated. Among the nine York Region municipalities, more than half of truck traffic is in the City of Vaughan, as are truck collisions.

TOP AT-FAULT TRUCK DRIVER ACTION IS FOLLOWING TOO CLOSE.

The next two pages show a density map showing truck traffic volume on Regional roads from 2010 to 2019 and a collision density map showing the locations of all reported truck collisions on Regional roads from 2018 to 2020..

Provincial highways are major trucking destinations

The Regional road segments with highest truck volumes in the City of Vaughan are Highway 7 between Jane Street and Weston Road, Highway 7 between Highway 427 and Highway 50, and Keele Street between Highway 7 and Steeles Avenue. These sections of road connect major trucking destinations, such as the CN MacMillan Yard at Highway 7 and Keele Street to major provincial highways, including Highways 400, 427 and 407.



2010-2019 Truck Volume Map

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0 5 10 km

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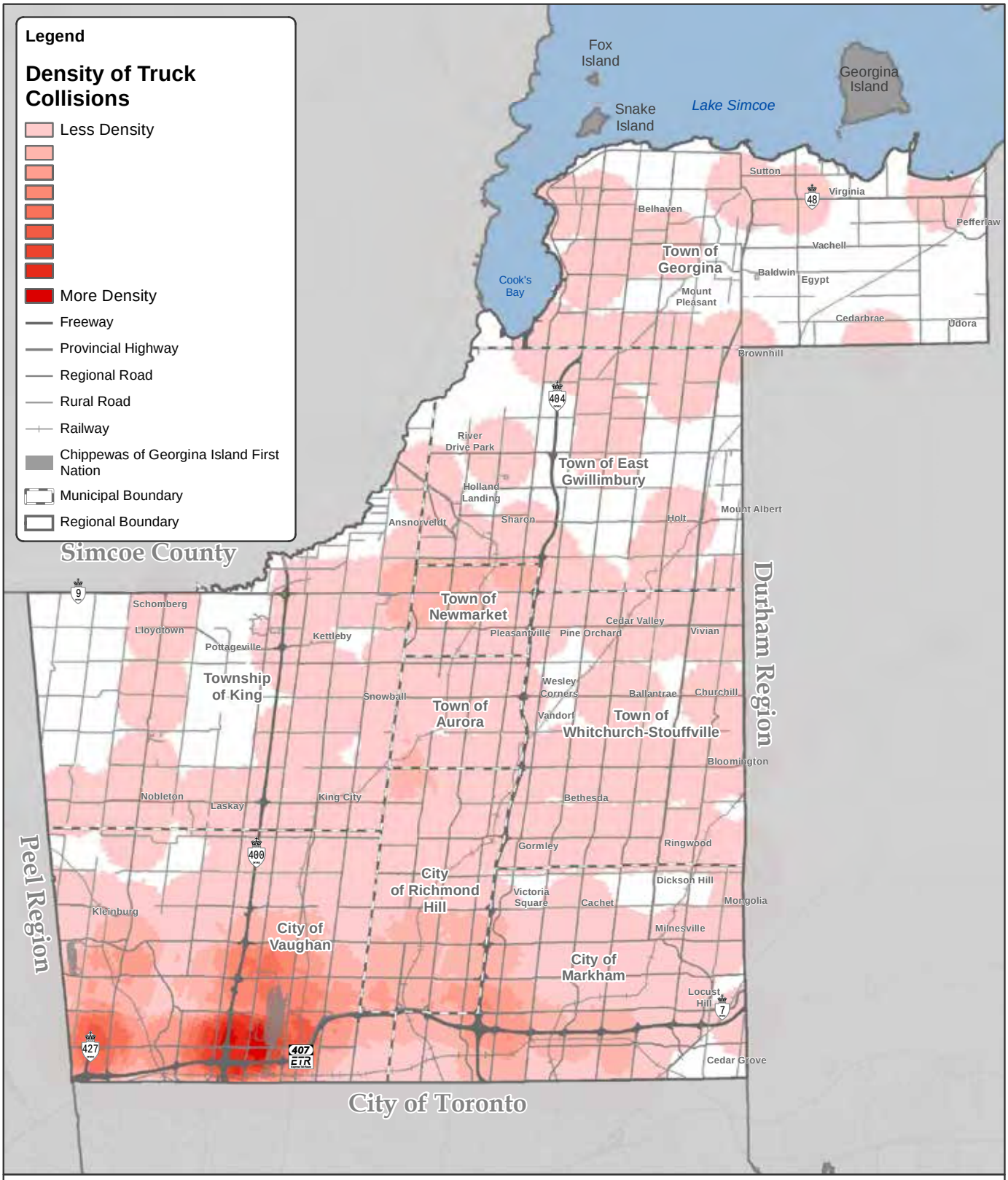

2018-2020 Truck Collision Hot Spot Locations Map

2021 Annual Collision Statistics Report

0 5 10 km

York Region

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Transportation and Infrastructure Planning
Transportation Services

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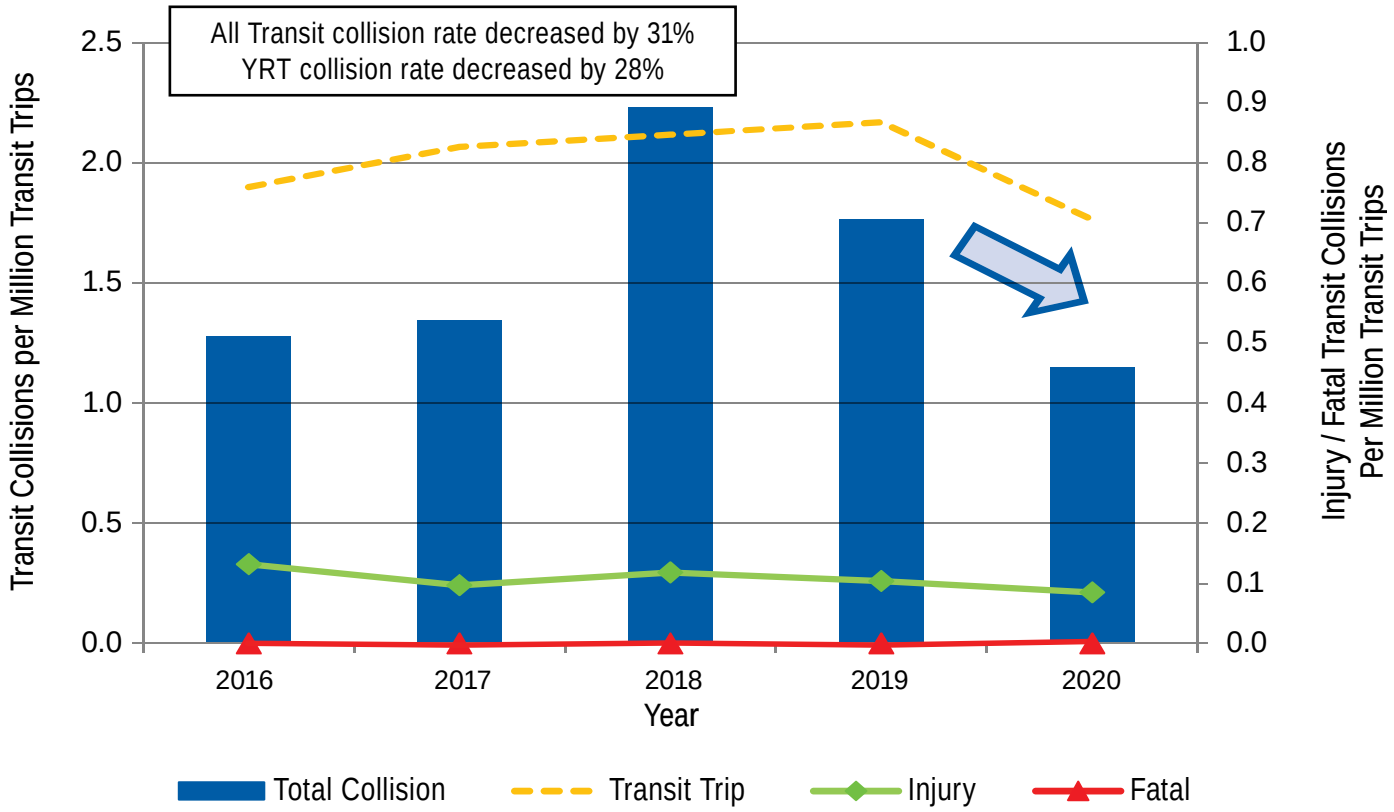
4A
MAJOR MACKENZIE
to WOODBINE AVE
715

Transit ↓ 31%

TRANSIT (PRIVATE AND PUBLIC) COLLISION RATES, 2016-2020



*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies

Collisions involving all public and private transit vehicles combined decreased by approximately 31% in 2020, largely due to reduced transit operations in the Region since Public Health restrictions related to the COVID-19 pandemic started. The 2021 MTO Road Safety Survey shows that 71% of Ontario residents say they are taking public transit less often than before the COVID-19 pandemic.

THERE HAVE BEEN NO FATALITIES RESULTING FROM COLLISIONS INVOLVING TRANSIT VEHICLES IN THE PAST FIVE YEARS.

The collision rate of exclusively YRT vehicles in 2020 was 28% lower than the average of 2016-2019. The injury rate of transit (public and private) collisions decreased as well, and the fatality rate stayed at zero during last five years.

To reduce crash or passenger injury risks, YRT is continuously deploying new on-board technologies, such as Mobile Eye pedestrian detection system and the init driver behaviour system. Mobile Eye is being piloted on all electric buses to warn bus drivers of cyclists and pedestrians that may be in their blind spots. The init driver behaviour system warns bus drivers when they make a harsh brake, acceleration or turn outside the set parameters to teach momentum-based driving skills and reduce the risk of passenger slip, trip or fall. A behaviour-based defensive driving program for bus drivers is also used for annual refresher and post-event training to focus on areas of opportunity to improve driving skills.

Sideswipe transit collisions decreased from 71 to 50 in 2020 compared to the previous four years. The majority (63%) of transit collisions were a result of the other vehicle driver being at-fault.

In 2020, staff highlighted to Regional Council the increasing trend in 2018 and 2019 of sideswipe collisions involving large vehicles, such as buses and trucks. While sideswipe collisions have significantly decreased in 2020, staff developed a safety campaign advising road users to leave more space for snowplows, trucks and buses, which will be launched in late fall of 2021.

Bus rapidways benefit all travellers

To promote sustainable transportation and growth, York Region is advancing its transit systems, in particular, building bus rapidways on selected road segments of its major transit corridors, such as Highway 7, Davis Drive and Yonge Street. The safety measures associated with bus rapidway operations have improved overall traffic safety, reducing collisions by about 50%.

Yonge North Subway Extension

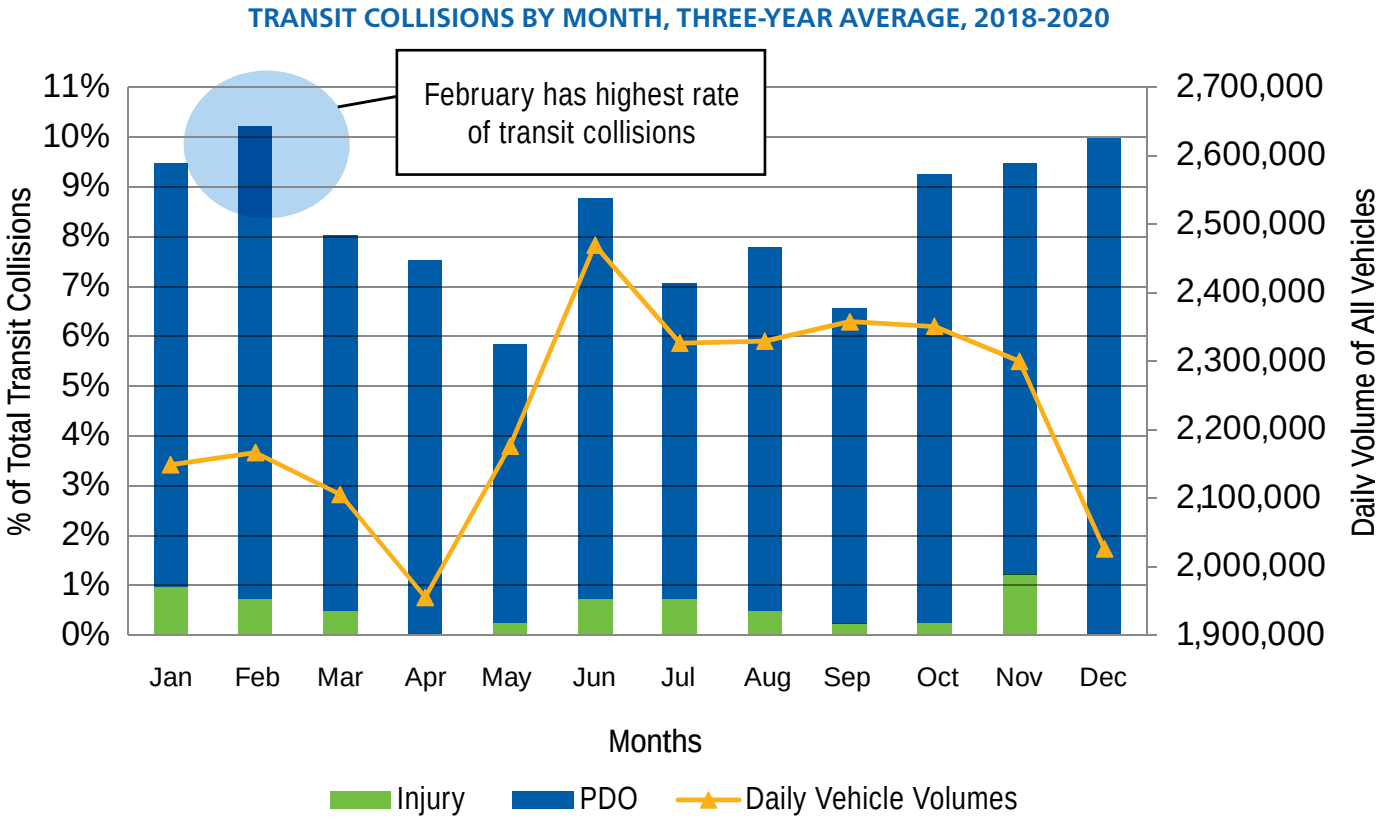
The planned Yonge North Subway Extension will extend north from Finch Station in Toronto to the Richmond Hill/Langstaff Urban Growth Centre in York Region. The extension will link Toronto's subway network with bus rapidways along Highway 7, providing seamless travel between York Region and Toronto while reducing travel times, managing traffic congestion and getting more people moving. Long-term safety benefits include reducing the number of vehicles, buses and transit riders using Yonge Street as well as intersections improvements along Yonge Street. Assuring the safety of transit riders and vulnerable road users within the extension area will be Region's long-term priority.

Key trends observed:

- There have been no fatal transit collisions since 2016
- There were more transit collisions in the winter than in summer and these predominantly occurred on weekdays
- Sideswipe collisions involving private and public buses decreased by 30% in 2020 compared to the previous four years
- In multi-vehicle collisions involving transit buses, the drivers of the other vehicles were mostly at fault (more than 60%)

Transit Collisions by Month, Day and Time

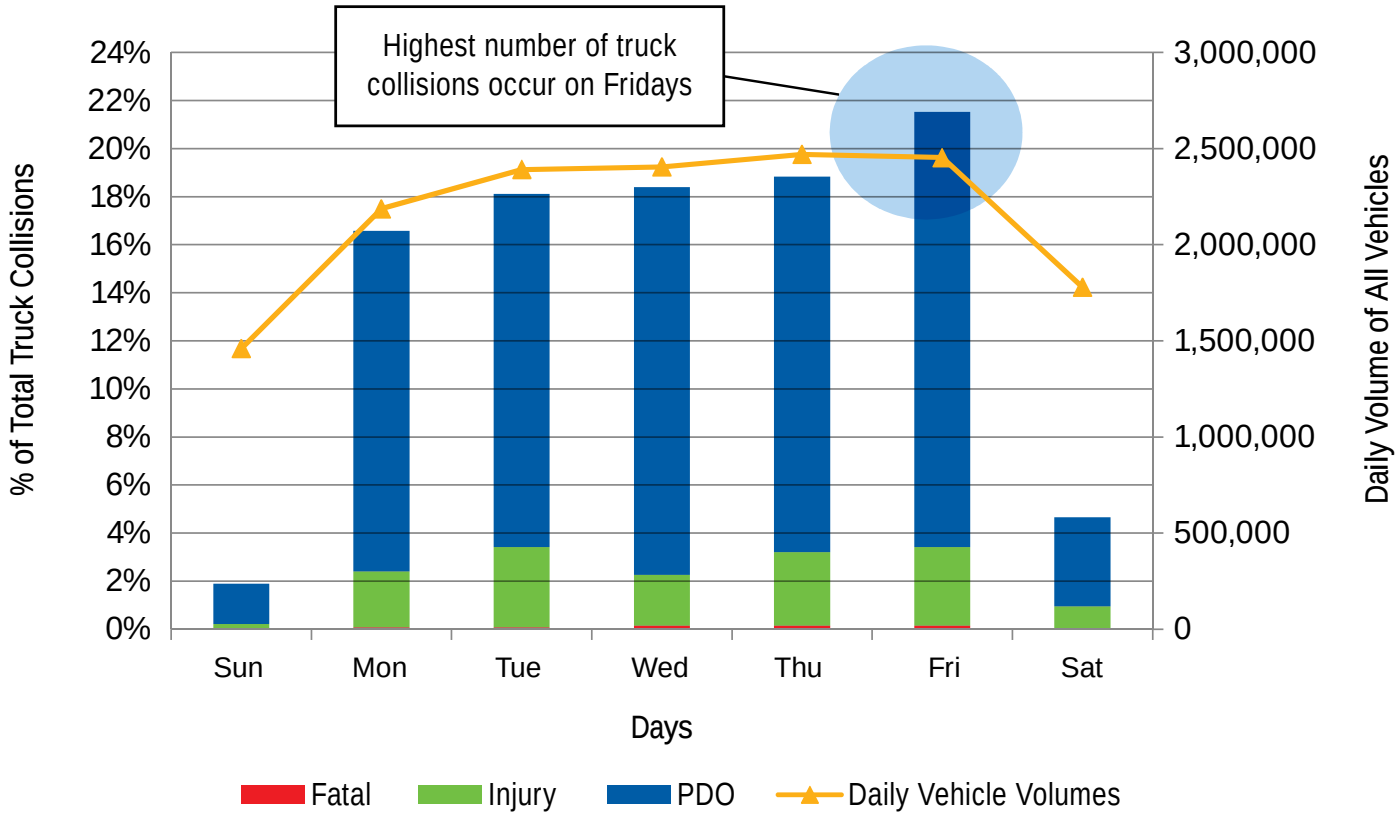
There was a higher number of transit collisions in the winter, attributed to shorter daylight hours and adverse weather.



*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

The number of transit collisions peaked on Thursdays, and more than 88% of transit collisions occurred on weekdays, which are associated with busier transit bus schedules and heavier ridership.

TRANSIT COLLISIONS BY DAY-OF-WEEK, THREE-YEAR AVERAGE, 2018-2020

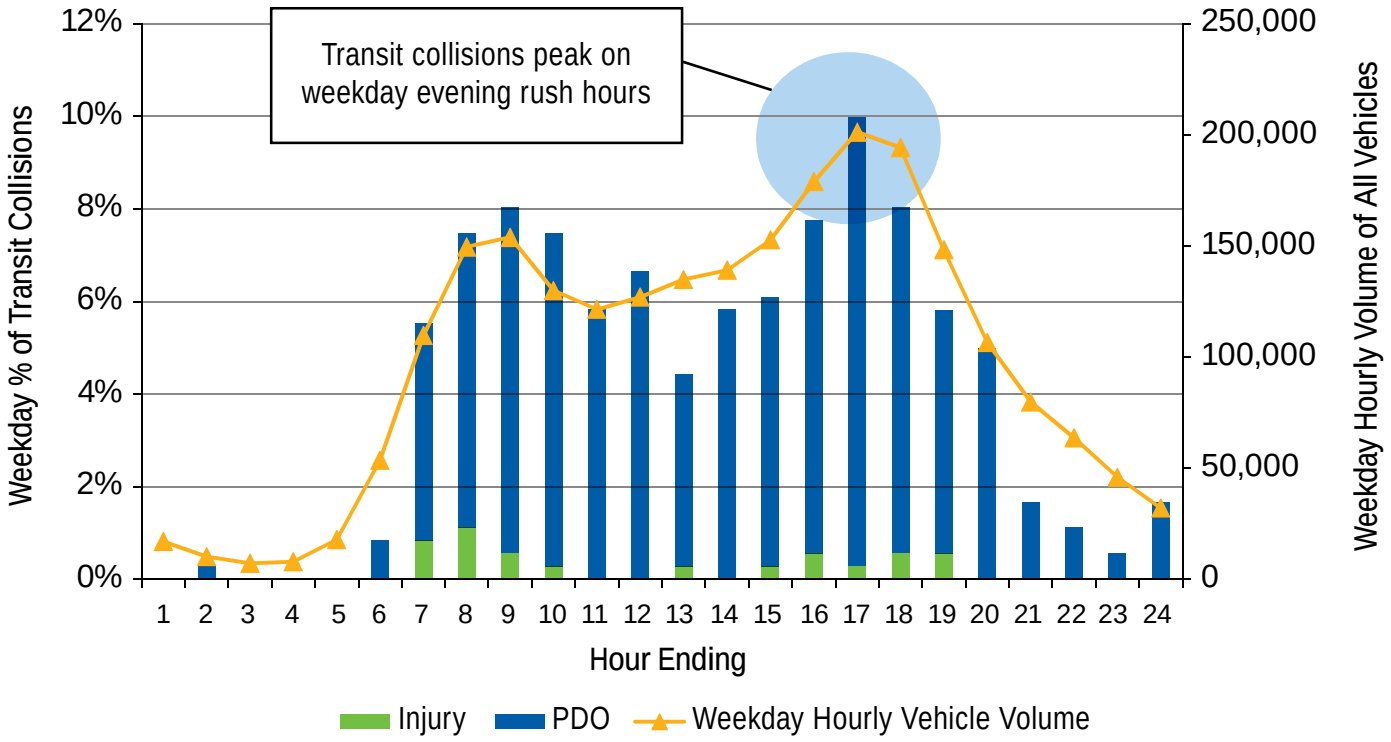


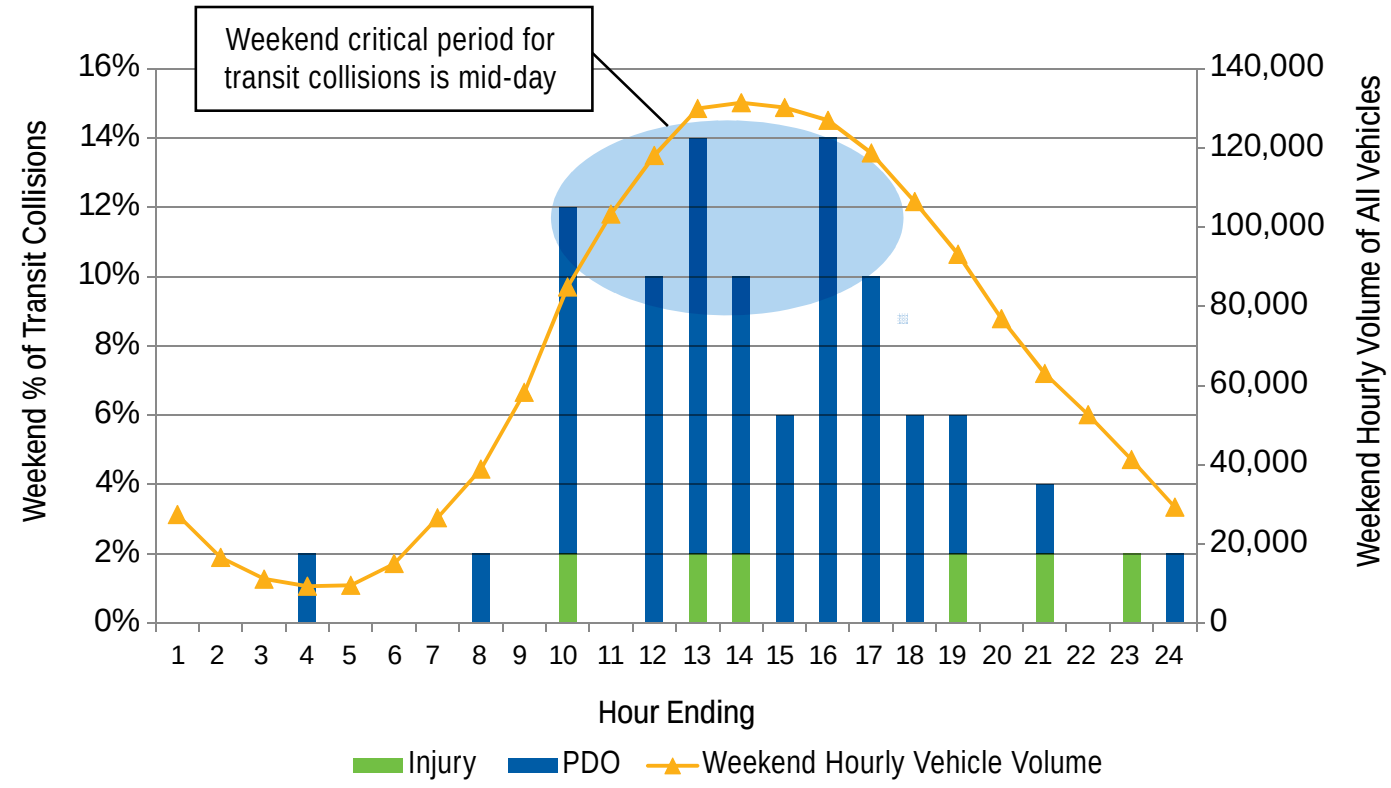
*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

During weekdays, the time-of-day transit collision trend correlates closely with typical daily traffic volume patterns (i.e. high numbers of collisions occur during highest traffic volume times). The highest number of collisions occurred on weekdays, between 7 a.m. and 10 a.m., and 3 p.m. and 6 p.m., accounting for about 50% of all collisions. Collisions were higher during the afternoon on weekdays, which is consistent with the number of daily vehicle trip patterns.

On weekends, the highest number of collisions occurred between 10 a.m. and 5 p.m.

TRANSIT COLLISIONS BY TIME-OF-DAY, THREE-YEAR AVERAGE, 2018-2020





*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

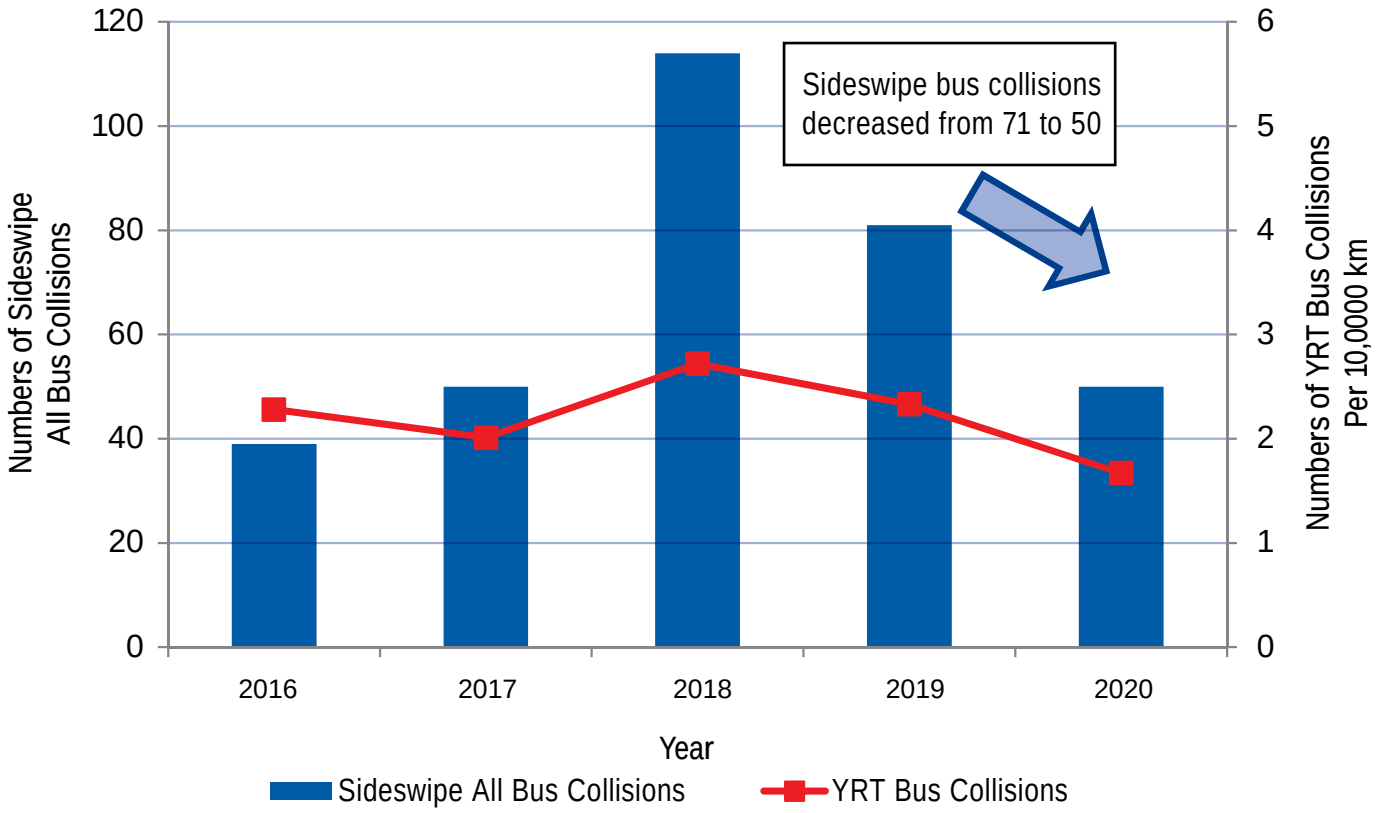
Impact Types and Driver Actions

Overall, other vehicles are at-fault 63% of the time in collisions involving transit vehicles. More than half (58%) of transit collisions are sideswipes, with other vehicles at-fault in more than 70% of those collisions.

Sideswipe collisions involving all private and public buses has decreased from 71 to 50

Buses are slower, longer and require more space. A pattern of motorists failing to provide buses ample space have led to a spike in the number of sideswipe collisions. Sideswipe collisions involving private and public buses decreased from 71 to 50 in 2020 when compared to the previous four years.

BUS COLLISION IMPACT TYPES



*The collision data is from YRP MVC reports and YRT
*Bus mileage data is from YRT

Bus Rapidways

Bus rapidways continue to show positive safety results

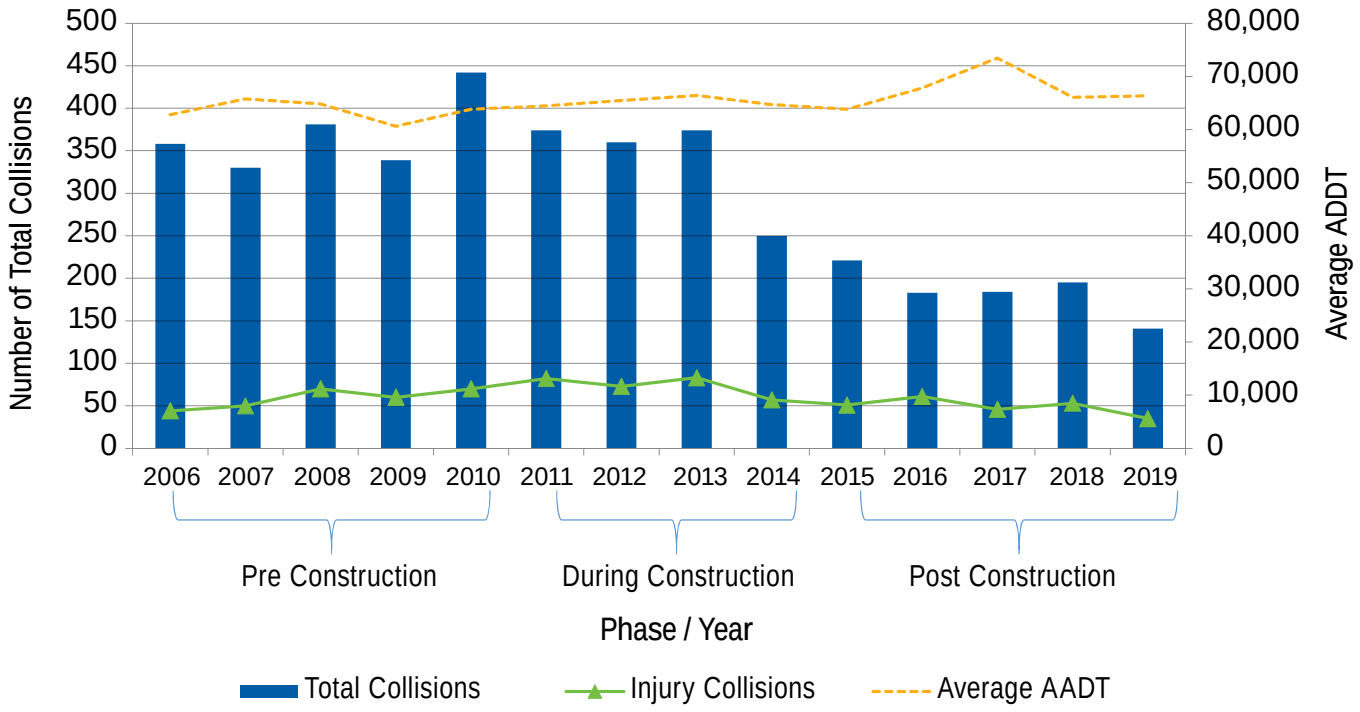
York Region's first bus rapidway was completed in 2014 on Highway 7 East between Bayview Avenue and South Town Centre Boulevard. This was followed by the completion of a rapidway on Davis Drive between Yonge Street and just east of Southlake Regional Health Centre in 2015. Since then four additional bus rapidways on Bathurst Street, Centre Street, Yonge Street in Newmarket, and Highway 7 in Vaughan were completed and opened.

It's been observed that total collisions have decreased by half on the road segments with bus rapidways, with injury collisions also decreasing significantly. The safety measures associated with bus rapidway operations augment the safety for the travellers of all modes. These include:

- Restricted access from side streets
- Regulatory speed limit reductions
- Transit signal phasings
- Protected left turn movements
- Reduced curb radii
- Cycle lanes/tracks
- Audible pedestrian signals
- Two-stage pedestrian crossings and enhanced markings and signage

The number of collisions on Highway 7 between Bayview Avenue and South Town Centre Boulevard has decreased by 50% since completion of rapidway construction. The number of injuries has also reduced by 16%. Meanwhile, the annual AADT of the same road segment has increased by 6% post-construction.

COLLISIONS ALONG HIGHWAY 7 BUS RAPIDWAY
between Bayview Avenue and South Town Centre Boulevard, 2006-2019

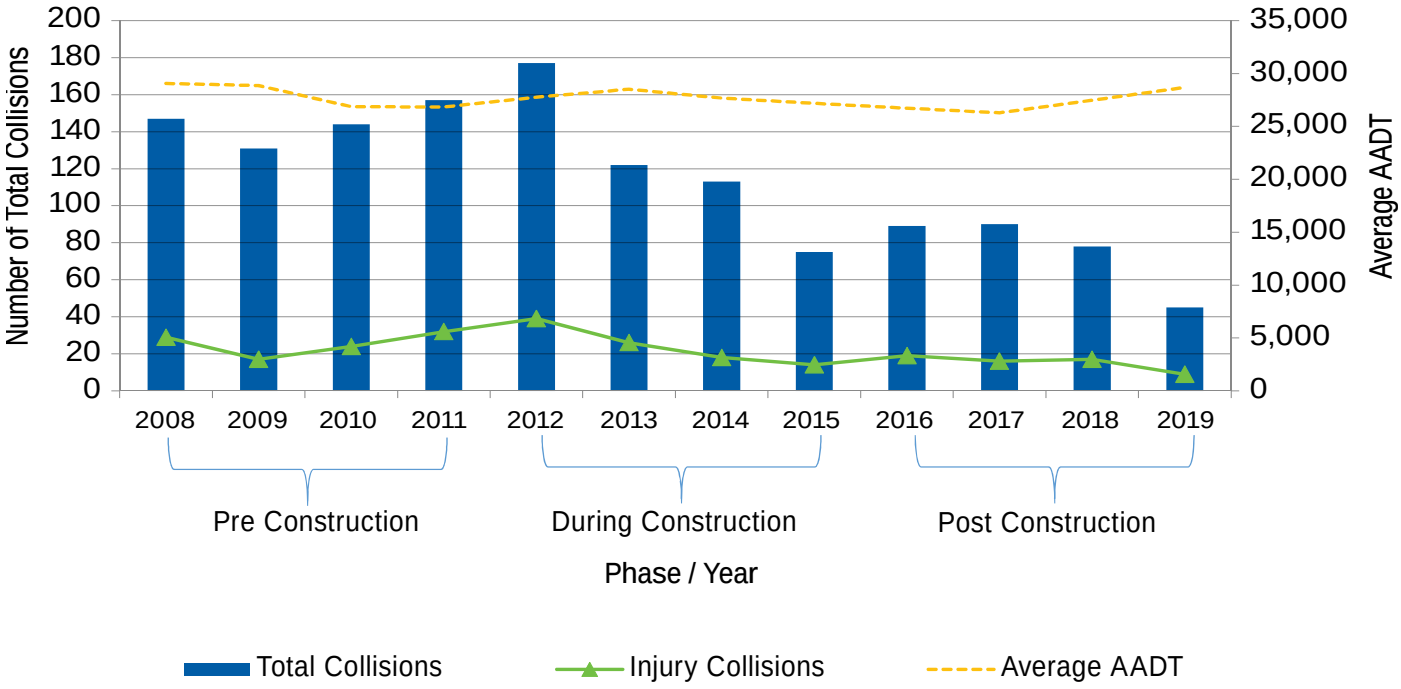


*The collision data is from YRP MVC reports
*Timelines of bus rapidway construction is from YRT website

TOTAL COLLISIONS AND INJURY COLLISIONS HAVE DECREASED BY 49% AND 37% RESPECTIVELY ON RAPIDWAY CORRIDORS SINCE RAPIDWAY COMPLETION.

The number of collisions on the segment of Davis Drive featuring the rapidway has decreased by 48% since completion of the rapidway construction. The number of injuries has also reduced by 40%. Meanwhile, the annual average daily traffic (AADT) of the corridor varied between 26,279 and 29,065, and there is no significant change between pre-construction, during construction, and post-construction periods.

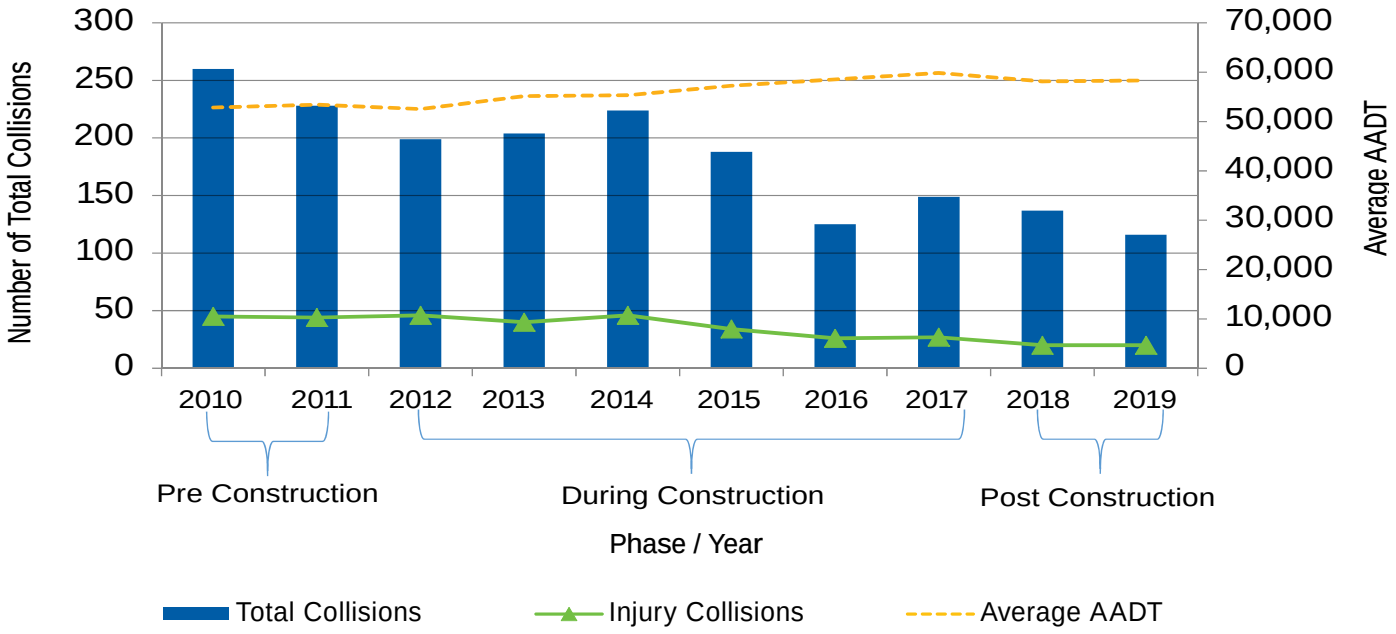
COLLISIONS ALONG DAVIS DRIVE BUS RAPIDWAY, 2008-2019



*The collision data is from YRP MVC reports
*Timelines of bus rapidway construction is from YRT website

The number of collisions on Highway 7 between Edgeley Boulevard and Bowes Road has decreased by 48% since completion of the rapidway construction. The number of injuries has also reduced by 55%. The AADT of the same road segment has increased by 10% post-construction.

COLLISIONS ALONG HIGHWAY 7 BUS RAPIDWAY
between Edgeley Boulevard and Bowes Road, 2010-2019



*The collision data is from YRP MVC reports
*Timelines of bus rapidway construction is from YRT website

Safety Programs

Taking steps to change driver behaviour

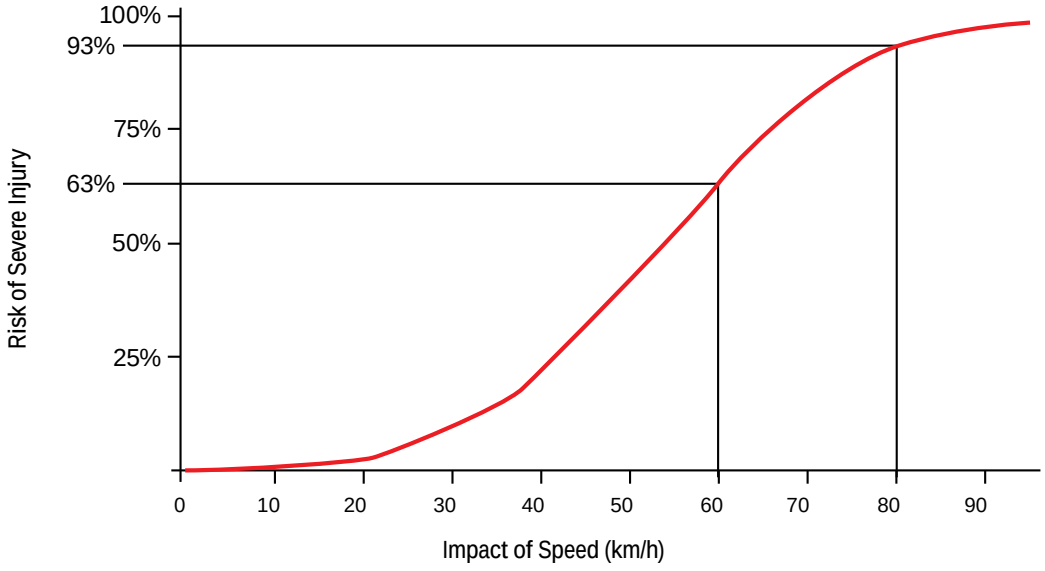
More than two-thirds of all collisions occurred at intersections and York Region has taken major steps to improve intersection safety. Main approaches include improving safety at existing signalized intersections with changes to turning movements, upgrading intersections with stop control to traffic signals, converting two-way controlled intersections to all-way stop-control, and implementing roundabouts.

Red light running is another intersection traffic safety priority for the Region, as this violation is the main reason for right-angle collisions, which cause more severe injuries than other types of collisions. The Region introduced the red light camera program in 2013 to help reduce red light running and improve driver and pedestrian safety.

Recognizing a change in driver behaviour is crucial to improving road safety, York Region has been targeting top traffic offences with campaigns and programs. As per the York Region Police Annual Statistical Reports from 2018 to 2020, the top traffic offence is speeding, accounting for more than 62% of all traffic offences.

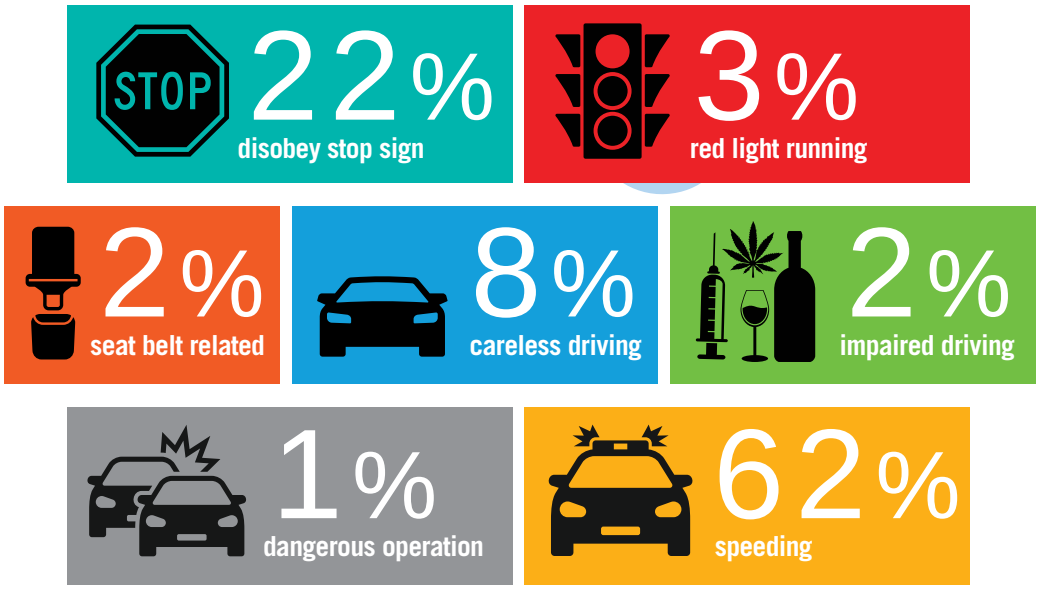
The 2021 MTO Road Safety Survey shows that nearly one-quarter of Ontario residents have asked a driver to slow down in the past 12 months,15% have felt unsafe because of the speed at which a driver was driving. Both of these indicators have increased significantly since 2017.

It is well known that higher impact speed leads to higher injury severity level in a collision. According to 2017 data, 22% of fatal car collisions in Canada involved speeding. Research has found when the impact speed is reduced from 80 km/h to 60 km/h, the risk of severe injury will be lowered from 93% to 63%, as shown in the figure below.



York Region has been actively advancing speed management programs, public education, legislations and enforcement to help reduce speed-related collisions. In partnership with YRP, the Region launched the Slow Down campaign, focused on stunt driving and speeding, with messages to encourage motorists to support one another by obeying the rules of the road and driving according to the posted speed limits. In spring 2021, YRP increased enforcement at nine top speeding hotspots identified by the Region and issued approximately 200 speeding tickets and warnings.

YORK REGION TRAFFIC OFFENCES, 2018-2020



*The traffic violation data is from YRP Annual Statistical Reports
*Red Light Running in the chart does not include the violations caught by red light cameras

SpeedWATCH

Displaying travel speed encourages compliance

While York Regional Police are responsible for enforcement of speed limits on Regional roads, the Region assists with education and data collection. The SpeedWATCH program, initiated in 2014, is designed for this purpose.

Residents can promote safe driving in their community by requesting a speed board. The speed board measures the speed of passing vehicles and displays it as they pass. This encourages drivers slow down and keep to the speed limit. Speed boards can also be placed along Regional roads to monitor locations for excessive speeding. Speed boards collect data that assists in the decision-making process on allocation of resources in specific locations.

Upon receiving a speed board request from residents, staff will place one speed board at the requested location for three to four months. Locations of speed boards are rotated to allow for maximizing road coverage and equal usage across the Region.

Data collected before and after implementation of a speed board has shown that they can reduce the average operating speed by 13% and increase driver compliance by 31%.

In 2021 the Region entered into an agreement to purchase an additional 15 speed boards, nearly doubling its supply.

To request a SpeedWATCH board visit the Speed Monitoring Boards page to complete the SpeedWATCH request form.

Automated Speed Enforcement

A new tool to help increase safety in school areas

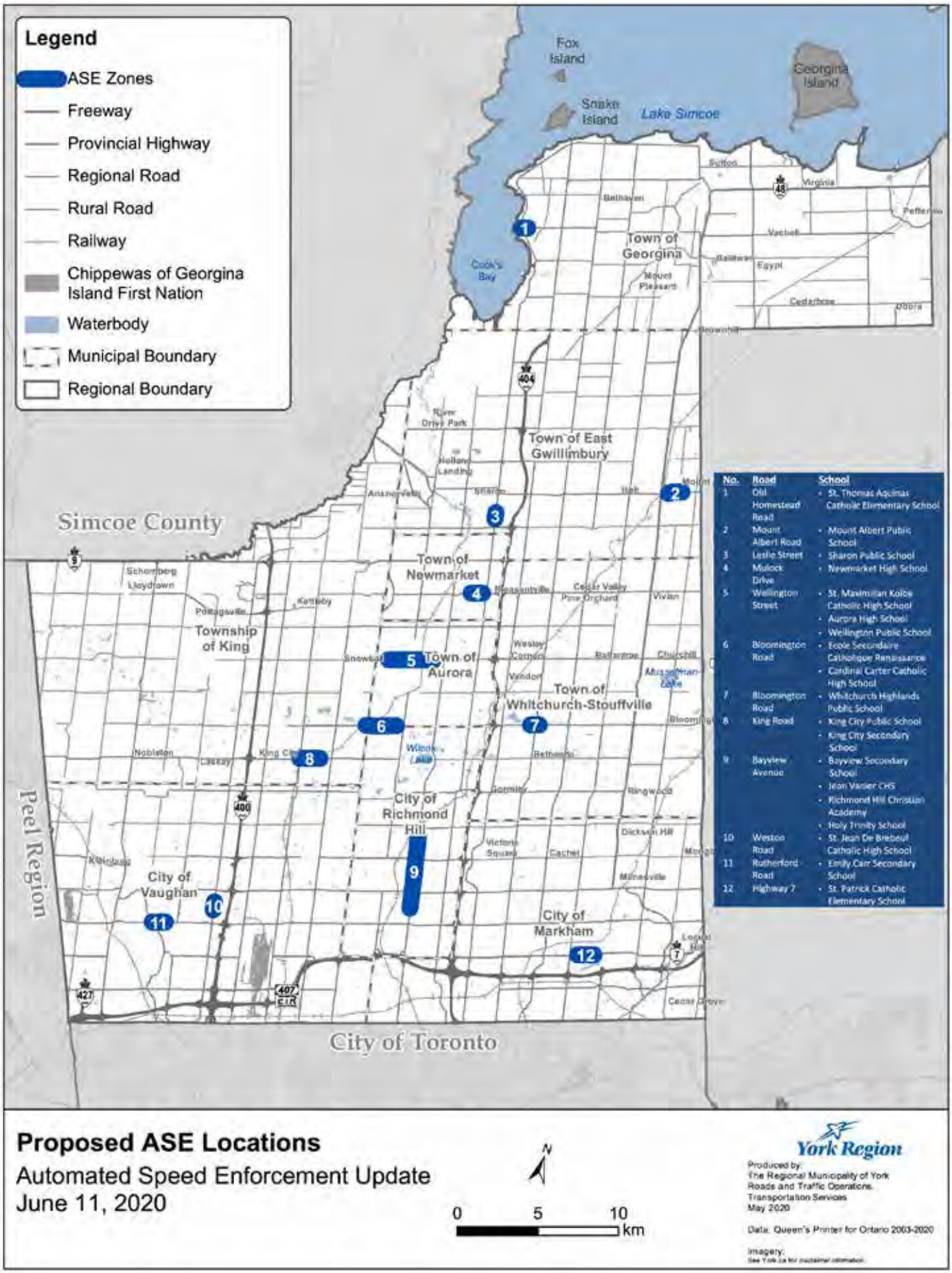
Automated speed enforcement (ASE) is a system that uses a camera and speed measurement device to enforce speed limits in identified areas. If a vehicle exceeds the posted speed limit in an automated speed enforcement area, the camera captures an image that is reviewed by a provincial offences officer. The image, license plate, ticket and associated fine are mailed within 30 days.

Under *Highway Traffic Act Regulation 398/19*, ASE is only authorized for use in school zones and community safety zones. Since November 2020, York Region is piloting one mobile ASE camera, rotating it on a monthly basis among 12 community safety zones covering 19 schools across the Region. The 12 sites were identified as the highest potential risk locations for school children by reviewing traffic volume, school population and travel speed. A map showing the 12 Regional ASE locations is provided on the next page.

York Region introduced ASE on a very limited, two-year pilot basis, to determine the capacity of provincial offences courts to process infractions, and to trial the technology being used. The goal of the pilot is to increase safety in school areas, while also changing driver behaviour.

Preliminary data is showing promising results in changing driver behaviour. Based on the first five deployment locations, from November 2020 to May 2021, operating speeds were at least 5 km/h lower on average when the ASE camera is visible. Court capacity continues to be limited to address disputes. The technology is operating to the satisfaction of the Region and municipal partners using ASE.

The CAA survey indicates 78% of parents agree and strongly agree that having a ASE in school zones deters speeding and 71% agree it should remain permanent in school zones.


Legend
ASE Zones
Freeway
Provincial Highway
Regional Road
Rural Road
Railway
Chippewas of Georgina Island First Nation
Waterbody
Municipal Boundary
Regional Boundary
Fox Island
Snake Island
Lake Simcoe
Georgina Island
Town of Georgina
Cook's Bay
Town of East Gwillimbury
Simcoe County
Town of Newmarket
Township of King
Town of Aurora
Town of Whitchurch-Stouffville
City of Richmond Hill
City of Vaughan
City of Markham
Peel Region
City of Toronto
No. Road School
1 Old Homestead Road • St. Thomas Aquinas Catholic Elementary School
2 Mount Albert Road • Mount Albert Public School
3 Leslie Street • Sharon Public School • Newmarket High School
4 Mulock Drive
5 Wellington Street • St. Maximilian Kolbe Catholic High School • Aurora High School • Wellington Public School
6 Bloomington Road • Ecole Secondaire Catholique Renaissance • Cardinal Carter Catholic High School
7 Bloomington Road • Whitchurch Highlands Public School
8 King Road • King City Public School • King City Secondary School
9 Bayview Avenue • Bayview Secondary School • Jean Vanier CHS • Richmond Hill Christian Academy • Holy Trinity School
10 Weston Road • St. Jean De Brebeuf Catholic High School
11 Rutherford Road • Emily Carr Secondary School
12 Highway 7 • St. Patrick Catholic Elementary School
Proposed ASE Locations
Automated Speed Enforcement Update
June 11, 2020
N
0 5 10 km
York Region
Produced by:
The Regional Municipality of York
Roads and Traffic Operations
Transportation Services
May 2020
Data: Queen's Printer for Ontario 2003-2020
Imagery:

Roundabouts

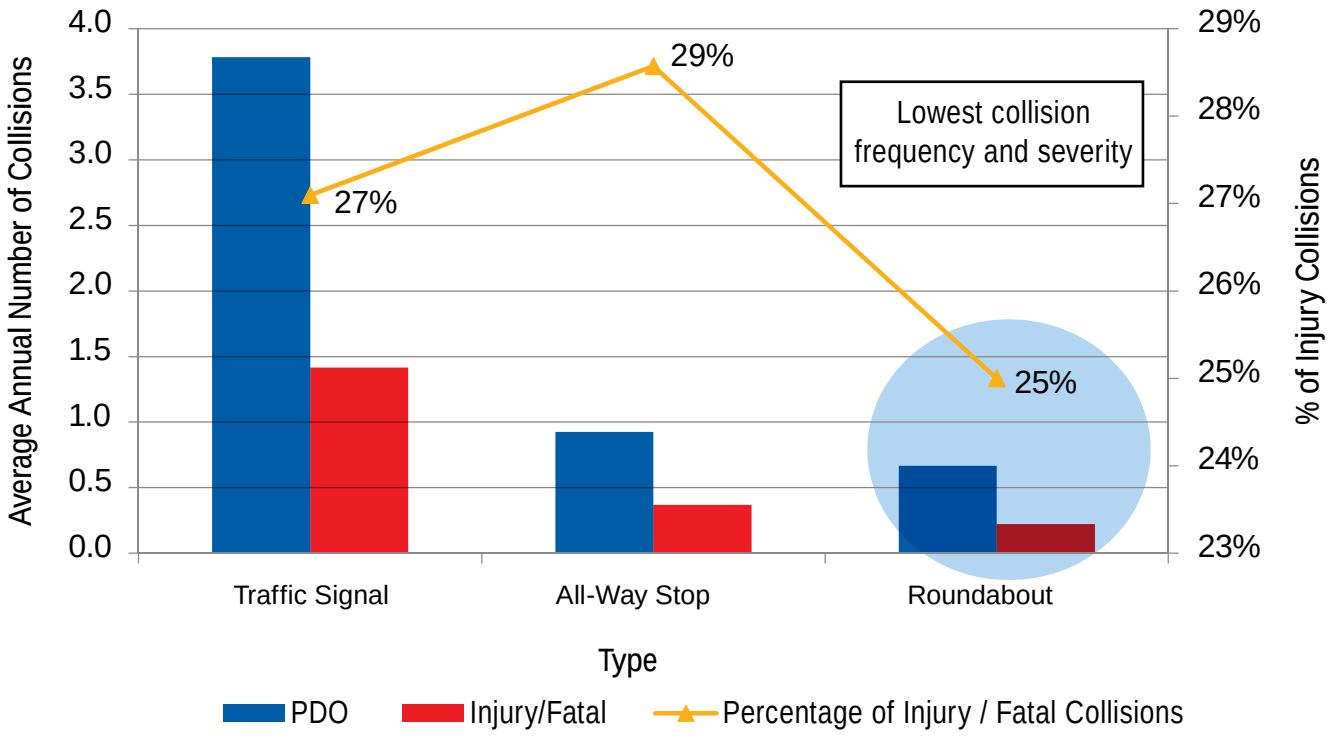
Superior safety performance and cost effectiveness

Three roundabouts have been installed by the Region to address mobility needs. The first Regional roundabout was installed in fall 2013 at the intersection of York/Durham Line and Durham Regional Road 5 in the City of Markham, as shown in the figure below. This was followed in 2016 with the implementation of roundabouts at Ninth Line and Bayberry Street in the Town of Whitchurch-Stouffville and Lloydtown-Aurora Road and Keele Street in the Township of King. Two roundabouts on Regional roads have also been implemented by other jurisdictions including the Province at the intersection of Highway 48 and Bloomington Road in 2018 and Durham Region at the intersection of Lake Ridge Road and Pefferlaw Road, both in 2019.

LLOYDTOWN-AURORA ROAD AND KEELE STREET ROUNDABOUT CONFIGURATION

As shown in the following chart, comparing the three Regional roundabouts to intersections controlled by traffic signals and all-way stops demonstrates a roundabout's superior safety performance even though they generally handle higher volumes than all-way stop controlled intersections.

COLLISIONS AT TRAFFIC SIGNALS, ALL-WAY STOPS AND ROUNDABOUTS



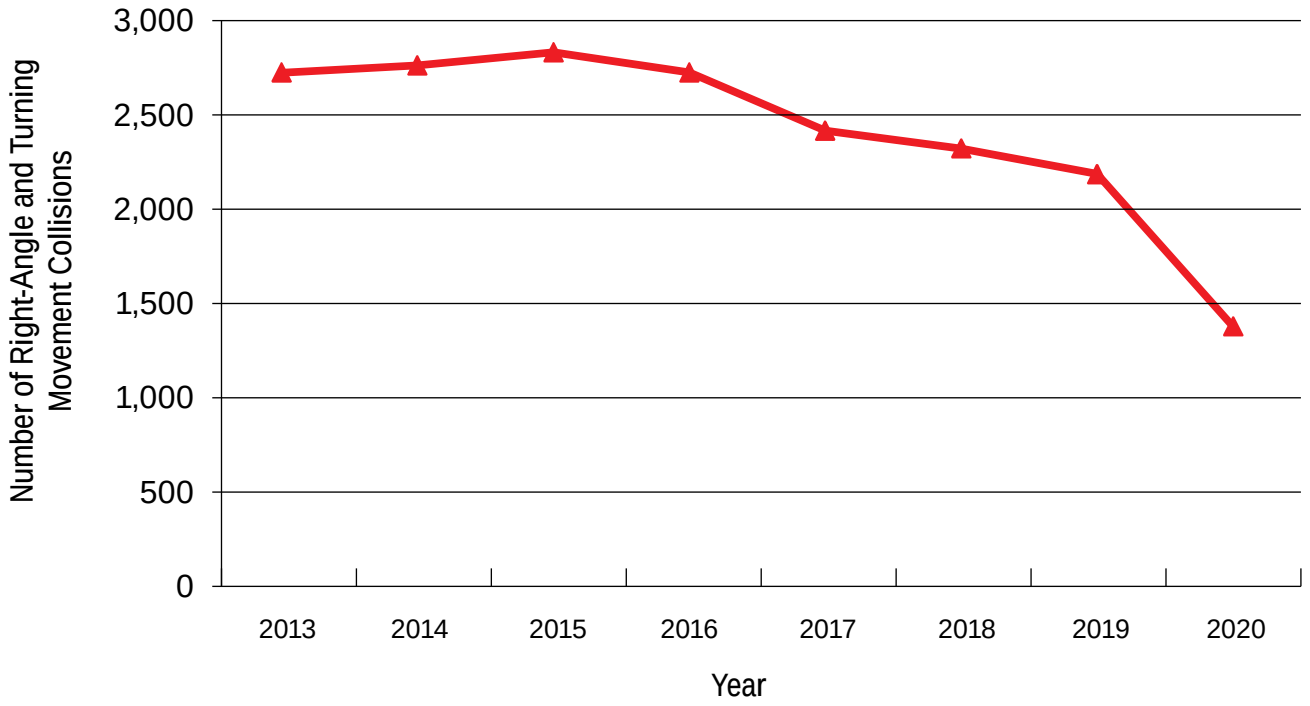
*The collision data is from YRP MVC reports

Although initial costs to construct a roundabout are much higher than a traffic signal, a roundabout can be more cost-effective in the long-term by eliminating traffic signal operating costs, reducing societal costs from lower collision rates, lowering collision severity and improving efficiency of the intersection. The Region will continue to consider roundabouts when reviewing intersection improvement opportunities given their benefits over other traffic controls under specific circumstances.

Red Light Cameras

Red light camera program began with 20 cameras in 2013 and expanded to 40 cameras in 2017. Throughout the years, the red light camera program has shown positive impact in reducing right-angle and turning movement collisions Region-wide at all signalized intersections; from 2,730 collisions in 2013 to 1,385 collisions in 2020, a reduction of approximately 50%.

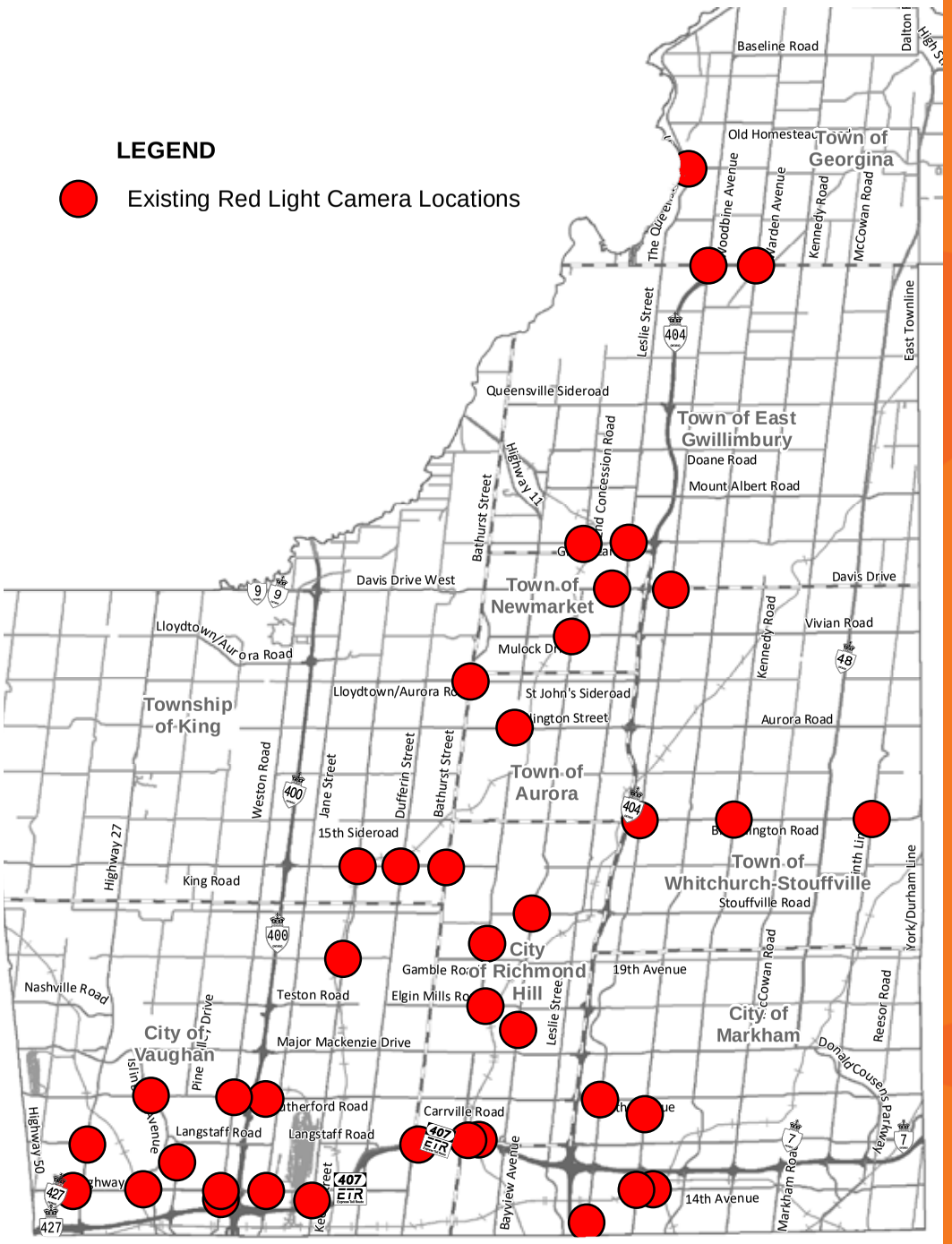
REGION-WIDE RIGHT-ANGLE AND TURNING MOVEMENT COLLISIONS



*The collision data is from YRP MVC reports

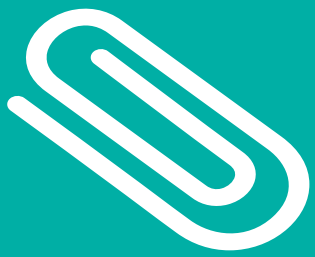
To determine which locations will most benefit from red light cameras, staff continue to monitor the performance of the program and are relocating some cameras to new locations to maximize program effectiveness. Locations are selected using the following process:

- Rank locations with high right-angle exposure using a risk analysis that takes into account volume, speed and road geometry
- Identify locations that experience high numbers of right-angle collision types that a red light camera may help reduce
- Conflict analysis through video observation to confirm red light running incidents at candidate locations
- Removing intersections that are part of major construction projects for prolonged periods, as using red light cameras in construction zones are not effective.



RED LIGHT CAMERA LOCATIONS

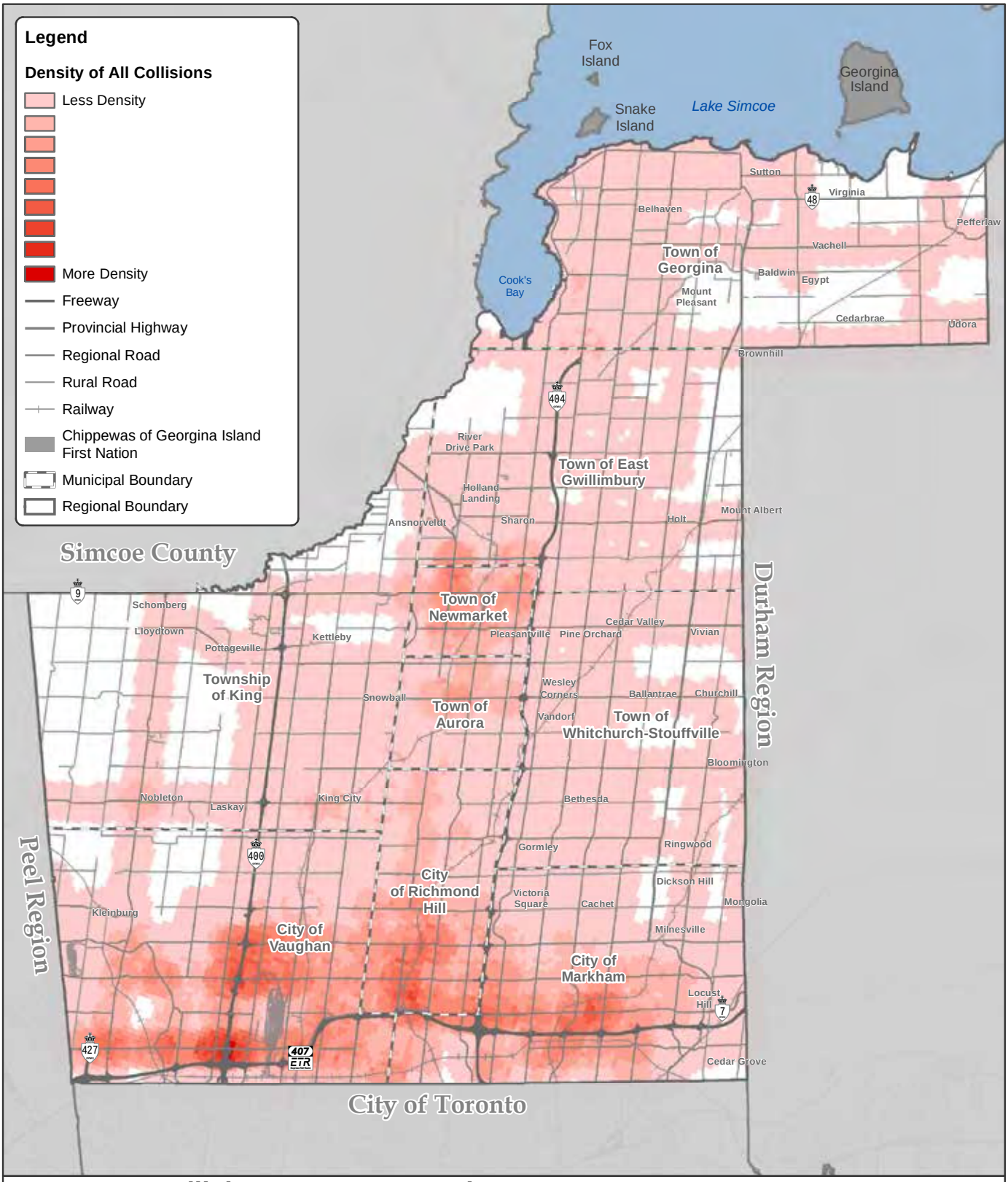
1. Davis Drive and Ashton Road / Carlson Drive
2. Highway 27 and Langstaff Road
3. Highway 7 and Yonge Street Connecting Road
4. Highway 7 and Vaughan Valley Boulevard / Roybridge Gate
5. Highway 7 and Bathurst Street Connecting Road
6. Bathurst Street and King Road
7. Dufferin Street and King Road
8. Green Lane East and Leslie Street
9. The Queensway South and Metro Road South / Morton Avenue
10. Wellington Street West / Wellington Street East and Yonge Street
11. Bloomington Road and Woodbine Avenue
12. Davis Drive and Woodbine Avenue
13. 14th Avenue and Birchmount Road
14. Bathurst Street and 18th Sideroad/St. John's Sideroad
15. Bayview Avenue and Crosby Avenue/Redstone Road
16. Bayview Avenue and Mulock Drive
17. Bloomington Avenue and Ninth Line
18. Bloomington Road and Kennedy Road
19. Elgin Mills Road and Enford Road / Yorkland Street
20. Green Lane East and Main Street North / 2nd Concession Road
21. Highway 7 and Islington Avenue
22. Keele Street and Doney Crescent / Jardin Drive
23. Keele Street and King Road
24. Keele Street and Kirby Road
25. Pine Valley Drive and Willis Road / Chancellor Drive
26. Ravenshoe Road and Warden Avenue
27. Rutherford Road and Sweetriver Boulevard
28. Stouffville Road and Bayview Avenue
29. Warden Avenue and Carlton Road / Baycliffe Road
30. Weston Road and Rowntree Dairy Road / Colossus Drive
31. Woodbine Avenue and 16th Avenue
32. Woodbine Avenue and Ravenshoe Road
33. Woodbine Avenue and Steelcase Road
34. Yonge Street and Jefferson Forest Drive / Tower Hill Road
35. Highway 7 and Red Maple Road
36. Warden Avenue and 14th Avenue
37. Weston Road and Rutherford Road
38. Highway 7 and Weston Road
39. Highway 7 and Jane Street
40. Islington Avenue and Rutherford Road



Collision Frequency and Severity

York Region's collision statistics show a continued decreasing trend in total collisions since 2011, with a 10-year low in 2020 of just over 4,000 motor vehicle collisions. Public Health restrictions related to the COVID-19 pandemic have resulted in a reduction in 2020 of 20-50% in annual traffic volume on Regional roads. The reduction in traffic volume has contributed to the significant decrease of the collision rate in 2020.

A collision density map showing the locations of all reported motor vehicle collisions on Regional roads from 2018 to 2020 is provided on the next page.



2018-2020 Collision Hot Spot Locations Map

2021 Annual Collision Statistics Report

0 5 10 km

York Region

Produced by:
Transportation and Infrastructure Planning
Transportation Services

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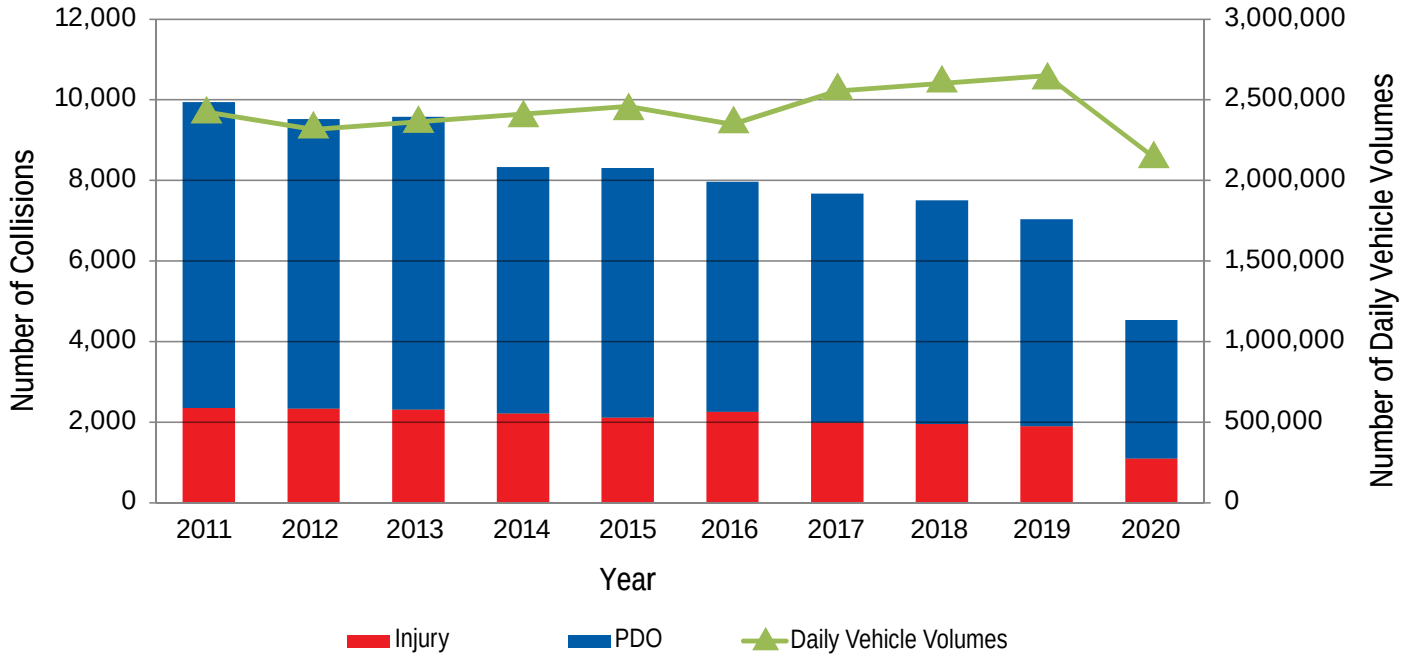
COLLISION FREQUENCY BETWEEN 2011 AND 2020



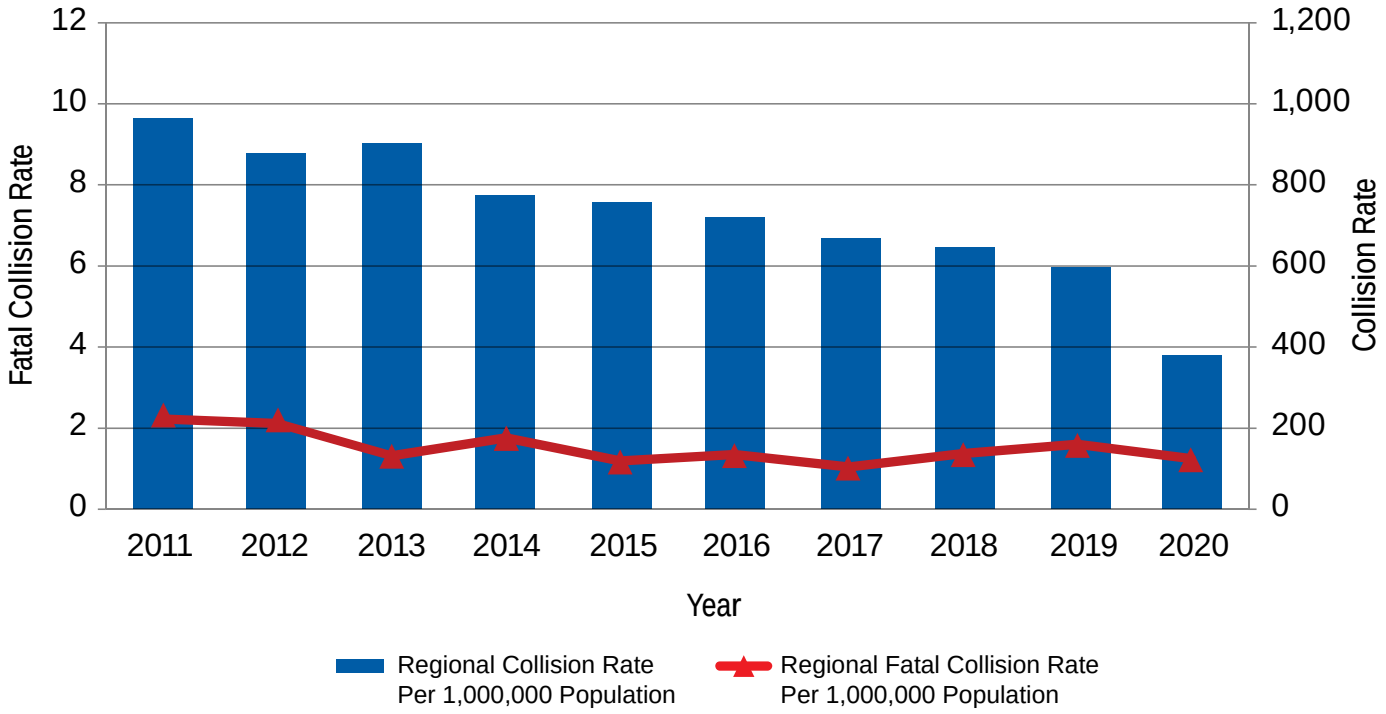
*The collision data is from YRP MVC reports
*The number of trips is based on TTS studies and Region's PCS data

Injury collisions are decreasing

While total collision statistics show a decreasing trend, the number of injury collisions also generally decreased since 2011, despite experiencing a spike in 2016 of more than 2,200 injury collisions. In 2020, the number of injury collisions dropped to a decade low of 1,100. Public Health restrictions related to the COVID-19 pandemic during 2020 resulted in a reduction of 20-50% in annual traffic volume on Regional roads, contributing to the significant decrease of injury collisions.

The general decreasing trend in injury collisions can be partially attributed to advancements in vehicle safety features and technology, such as brake assist, forward collision warning, automated emergency braking, blind spot warning, lane departure warning, lane keep assist, and also to strengthened legislation, increased fines and road safety programs.

FREQUENCY OF FATAL COLLISIONS, BETWEEN 2011 AND 2020

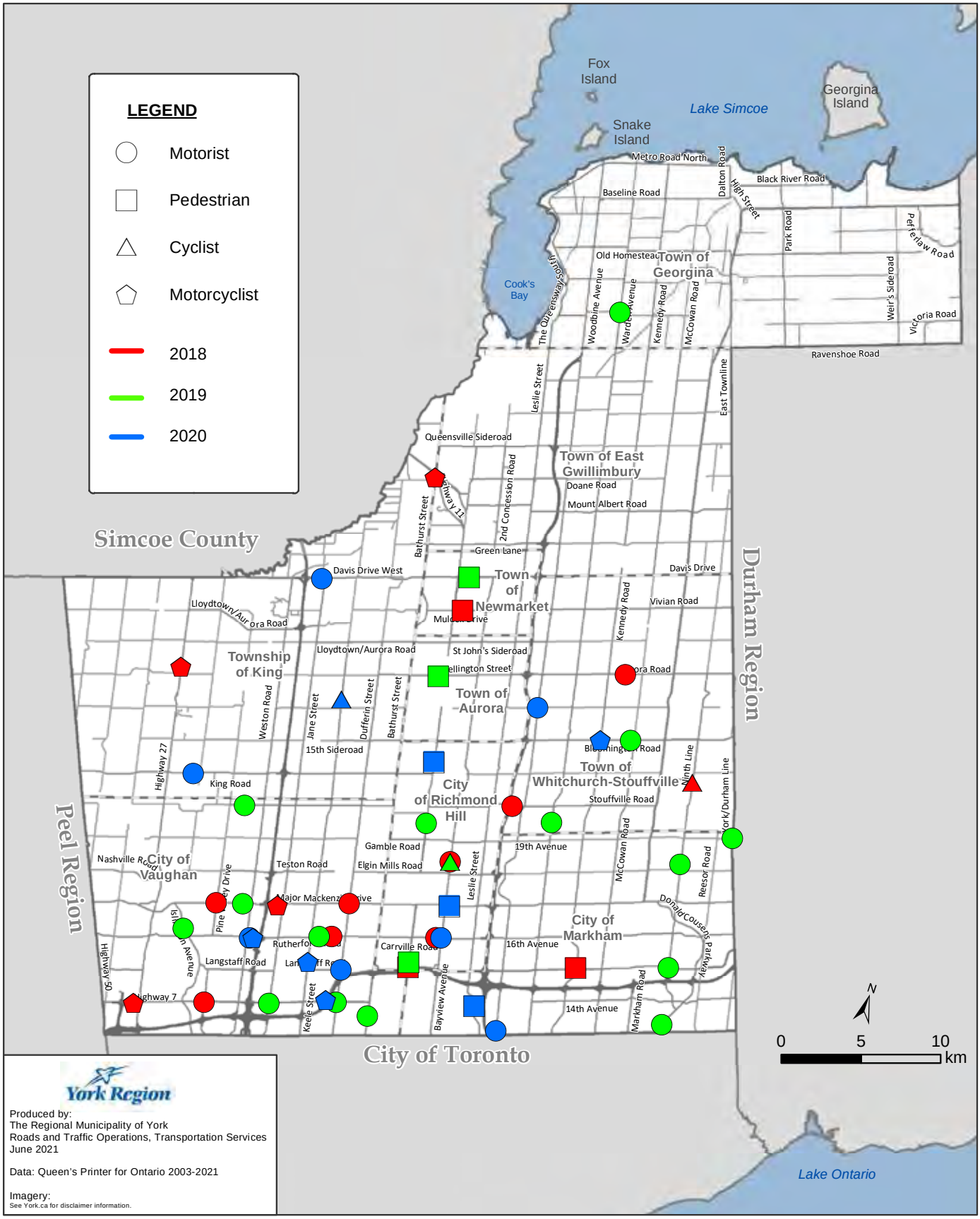


*The collision data is from YRP MVC reports
*The population data is from Statistics Canada

Fatal collisions can spike in any given year

The number of fatal collisions continues to fluctuate year over year. After the Region experienced a 10-year low in fatal collisions in 2017, with a total of 12 fatalities, the fatal collision numbers rose to 19 fatalities in 2019, the highest since 2012. In 2020, there were 15 fatalities, partially due to the reduced annual traffic volume resulting from Public Health restrictions related to the COVID-19 pandemic. The 2018–2020 fatal collision locations map is shown on the next page.

York Region | 2018 - 2020 Fatal Collision Locations



Produced by:
The Regional Municipality of York
Roads and Traffic Operations, Transportation Services
June 2021

Data: Queen's Printer for Ontario 2003-2021

Imagery:
See York.ca for disclaimer information.

Top 10 High Collision Locations by Town/City

The 2018 to 2020 top 10 collision frequency locations in York Region continue to be those situated at intersections along high volume arterial corridors, including Highway 7, Major Mackenzie Drive, Rutherford Road/16th Avenue, Davis Drive, Green Lane and Yonge Street. Eight of the top 10 collision frequency locations were also hot spots in last year's report.

These arterial roads are York Region's most travelled roadways. They provide a continuous link from York Region to Peel Region, Durham Region and Simcoe County; and, connect Regional roads to Highways 11, 427, 400, 404 and 407.

TOP 10 HIGHEST COLLISION FREQUENCY LOCATIONS, THREE-YEAR TOTAL, 2018-2020

Description (Rank in Previous Report)	Three-Year Injury Collisions	Three-Year Total Collisions
1. Islington Avenue and Rutherford Road (4)	20	85
2. Keele Street and Highway 7 (2)	9	85
3. Highway 7 and Weston Road (1)	17	82
4. Yonge Street and Green Lane (3)	18	75
5. Highway 7 and Jane Street (10)	6	68
6. Highway 7 between Huntington Road and Highway 427 (27)	15	67
7. Weston Road and Rutherford Road (5)	18	66
8. Highway 27 and Rutherford Road (12)	16	63
9. Rutherford Road and Sweetriver Boulevard (11)	11	63
10. Major Mackenzie Drive West and Bathurst Street (20)	19	61

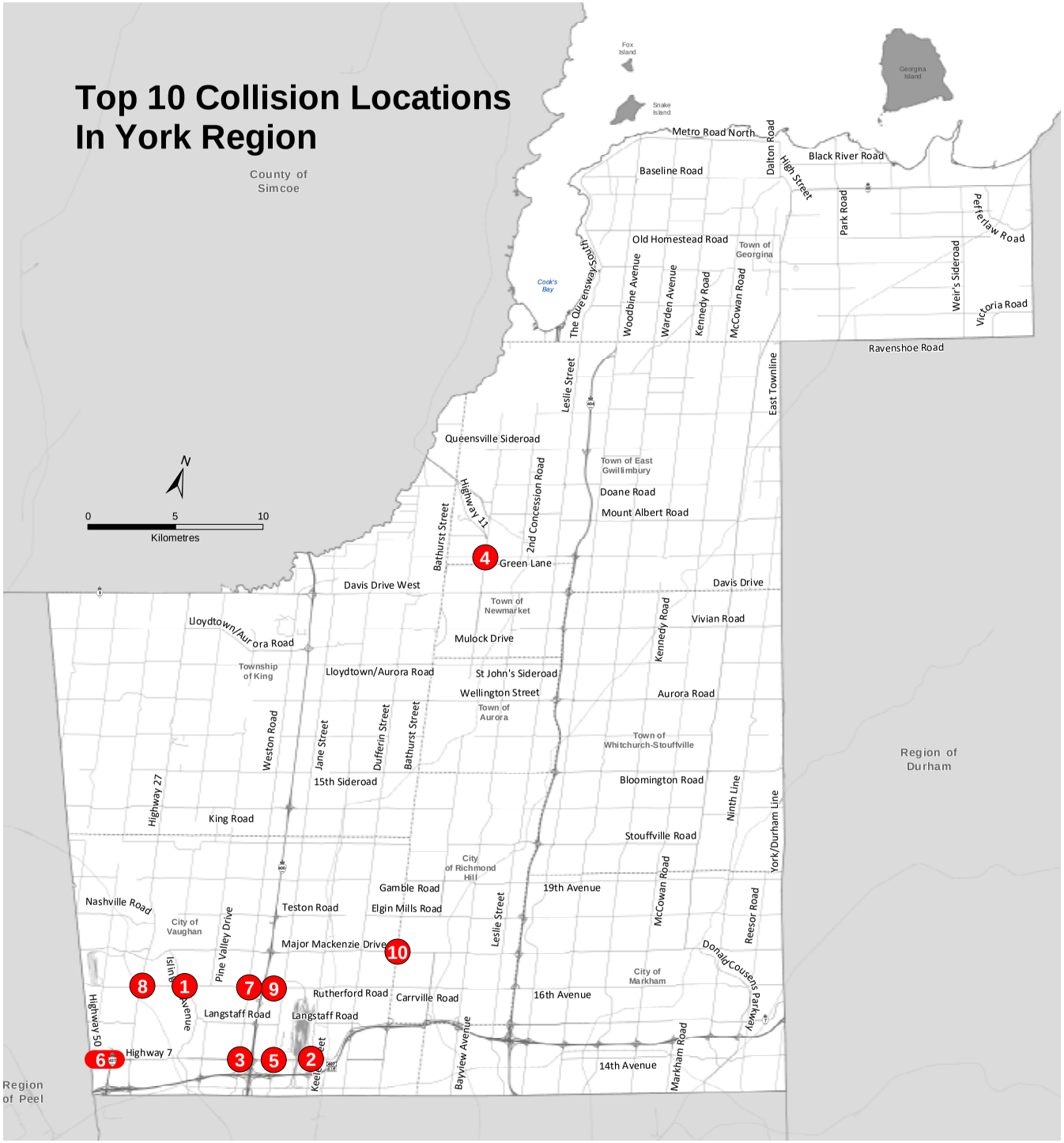
*The collision data is from YRP MVC reports

With the support of York Region Council, for the past few years the Region has invested millions of dollars on road capital projects along these most travelled roadways. Projects include road reconstruction, road widening, bus rapid transit lanes and vivaNext station construction, intersection upgrades and improvements to enhance traffic operations and safety for all road users. York Region is investing $3.1 billion in the Regional transportation network over the next 10 years.

Top 10 Collision Locations in York Region

The following maps illustrate the top 10 collision locations in York Region and for each of nine local municipalities for the three-year period between 2018 and 2020.

- York Region
- Town of Aurora
- Town of East Gwillimbury
- Town of Georgina
- Township of King
- City of Markham
- Town of Newmarket
- City of Richmond Hill
- City of Vaughan
- Town of Whitchurch-Stouffville



TOP 10 COLLISION LOCATIONS

YORK REGION

1. Islington Avenue and Rutherford Road (85)
2. Keele Street and Highway 7 (85)
3. Highway 7 and Weston Road (82)
4. Yonge Street and Green Lane East/ Green Lane West (75)
5. Highway 7 and Jane Street (68)
6. Highway 7 between Huntington Road and Highway 427 - Highway 7 Ramp (67)
7. Weston Road and Rutherford Road (66)
8. Highway 27 and Rutherford Road (63)
9. Rutherford Road and Sweetriver Boulevard (63)
10. Major Mackenzie Drive West and Bathurst Street (61)

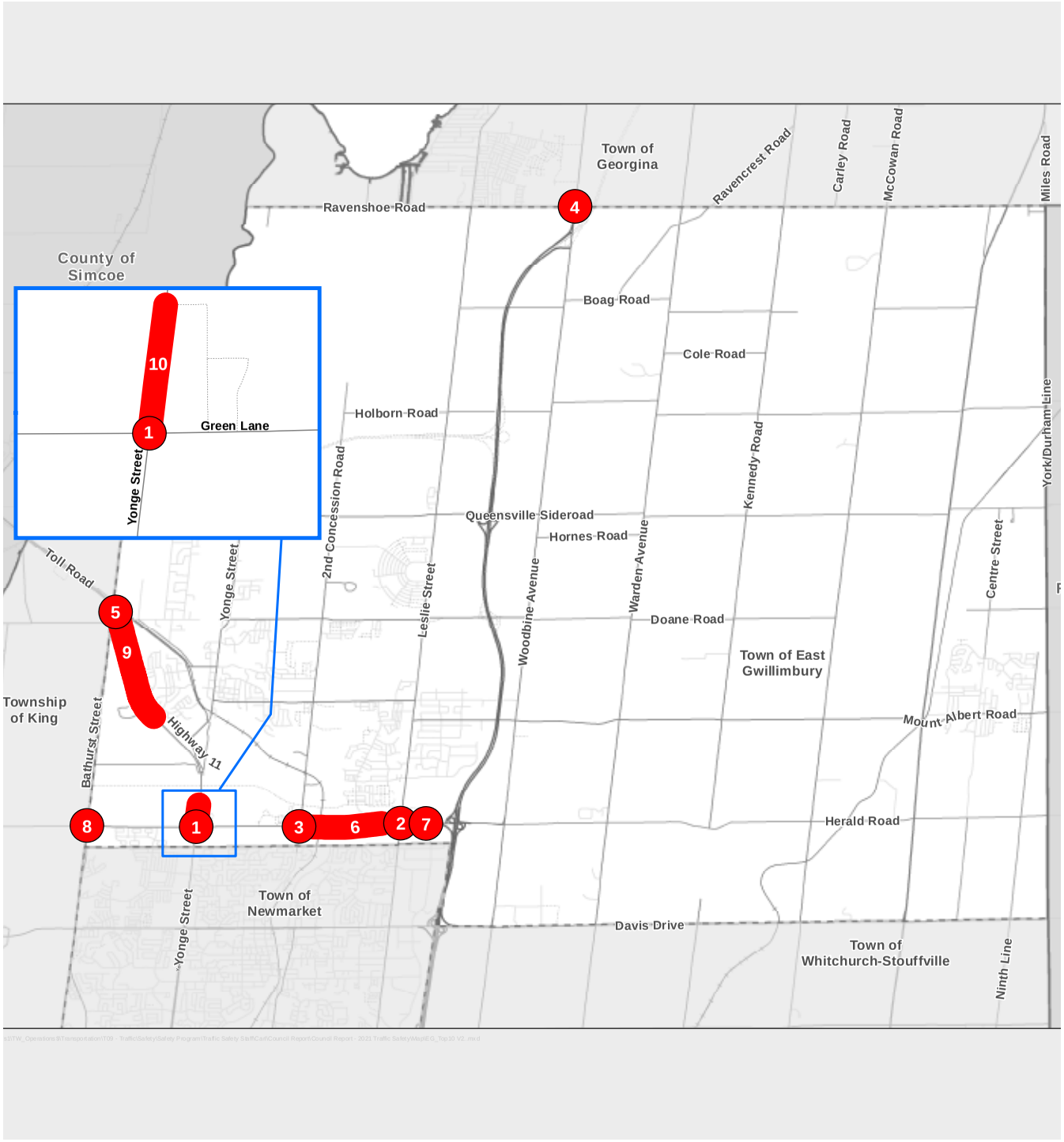
Value in the parentheses represents number of collisions between 2018 and 2020

TOP 10 COLLISION LOCATIONS

TOWN OF AURORA

1. Wellington Street East and Yonge Street/Wellington Street West (50)
2. Bathurst Street and 15th Sideroad/ Bloomington Road (34)
3. Leslie Street and Wellington Street East (34)
4. St John's Sideroad and Bayview Avenue (27)
5. Wellington Street East and Bayview Avenue (27)
6. Wellington Street East and Mary Street/John West Way (25)
7. Yonge Street and St John's Sideroad (22)
8. Wellington Street West and Bathurst Street (21)
9. Wellington Street East and Industrial Parkway North/Industrial Parkway South (21)
10. Leslie Street and St John's Sideroad (15)

Value in the parentheses represents number of collisions between 2018 and 2020

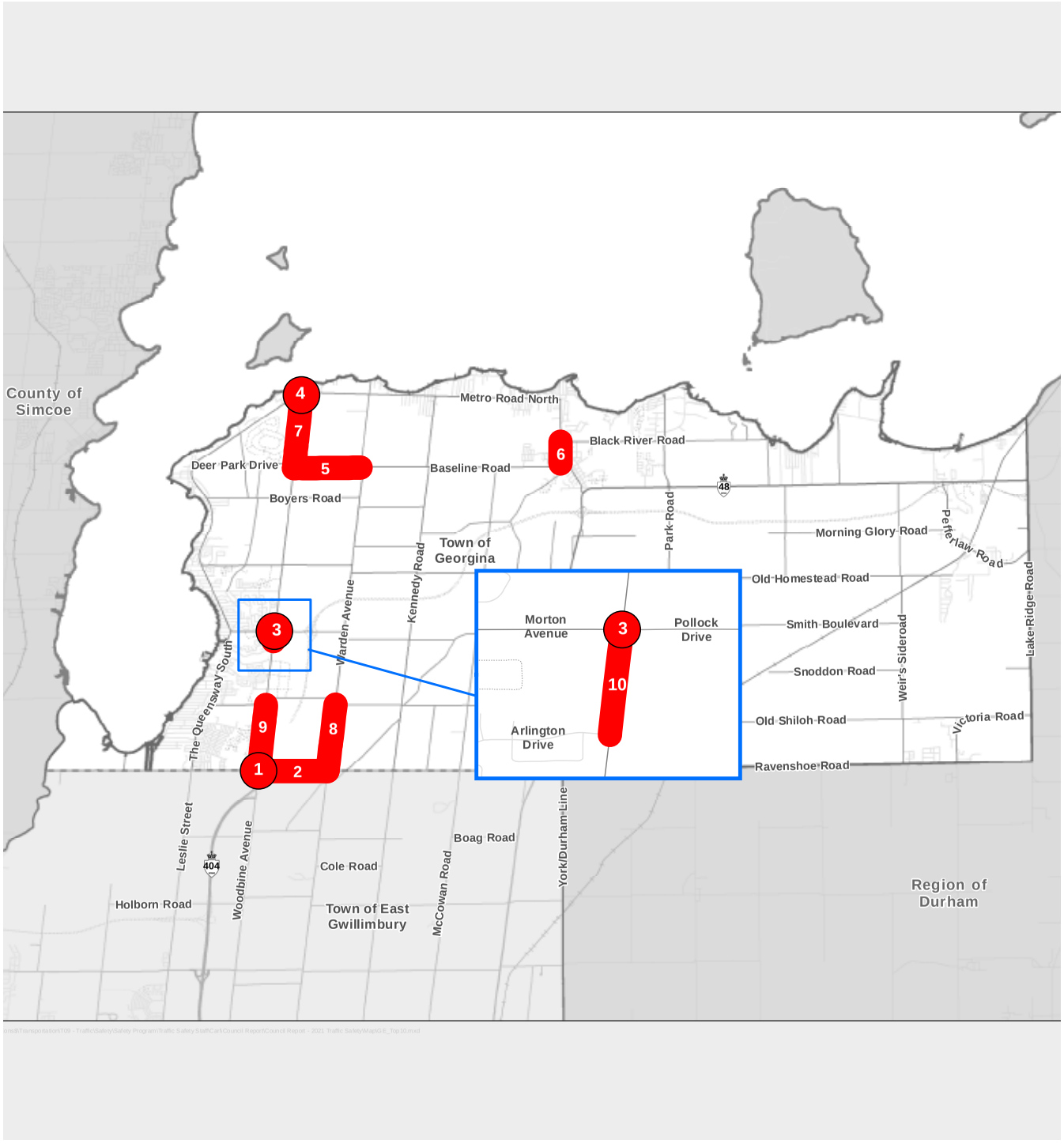


TOP 10 COLLISION LOCATIONS

TOWN OF EAST GWILLIMBURY

1. Yonge Street and Green Lane East/Green Lane West (75)
2. Leslie Street and Green Lane East (52)
3. Green Lane East and Main Street North/2nd Concession Road (45)
4. Woodbine Avenue and Ravenshoe Road (43)
5. Highway 11 and Bathurst Street (22)
6. Green Lane East between East Gwillimbury GO Station and Old Green Lane (21)
7. Green Lane East and Harry Walker Parkway (19)
8. Green Lane West and Miller's Sideroad/ Bathurst Street (14)
9. Highway 11 between Sherwood Glen and Bathurst Street (14)
10. Yonge Street between Green Lane East/ Green Lane West and Commercial Plaza (Lowes) / Church Entrance (13)

Value in the parentheses represents number of collisions between 2018 and 2020

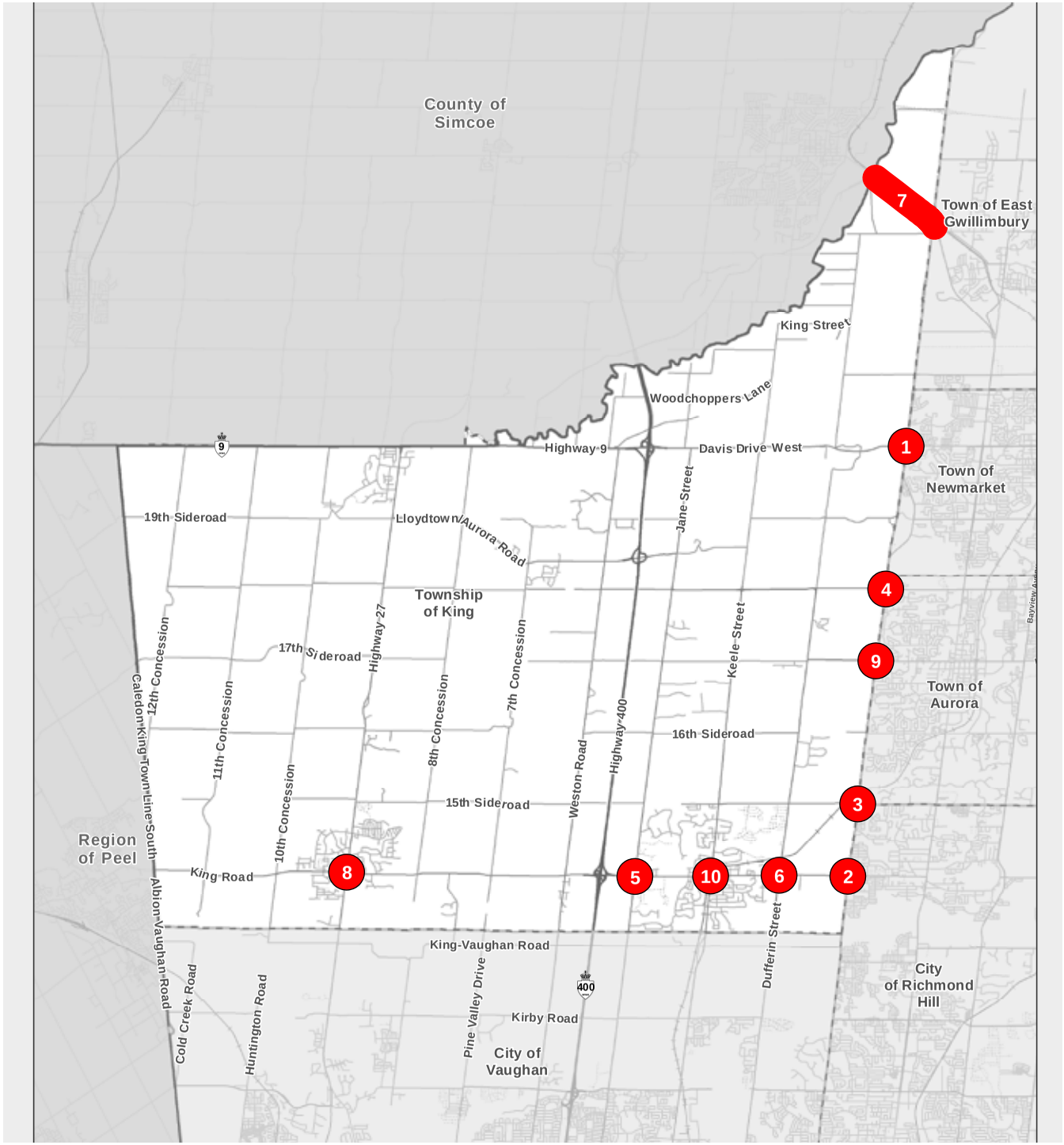


TOP 10 COLLISION LOCATIONS

TOWN OF GEORGINA

1. Woodbine Avenue and Ravenshoe Road (43)
2. Ravenshoe Road between Woodbine Avenue and Warden Avenue (19)
3. Woodbine Avenue and Morton Avenue/Pollock Road (18)
4. Woodbine Avenue and Metro Road North (13)
5. Baseline Road between Woodbine Avenue and Civic Centre Road (11)
6. Dalton Road between McDonough Avenue/High Street and Black River Road (10)
7. Woodbine Avenue between Deer Park Road and Metro Road North (9)
8. Warden Avenue between Ravenshoe Road and Glenwoods Avenue (8)
9. Woodbine Avenue between Ravenshoe Road and Glenwoods Avenue (8)
10. Woodbine Avenue between Arlington Drive and Morton Avenue/Pollock Road (8)

Value in the parentheses represents number of collisions between 2018 and 2020

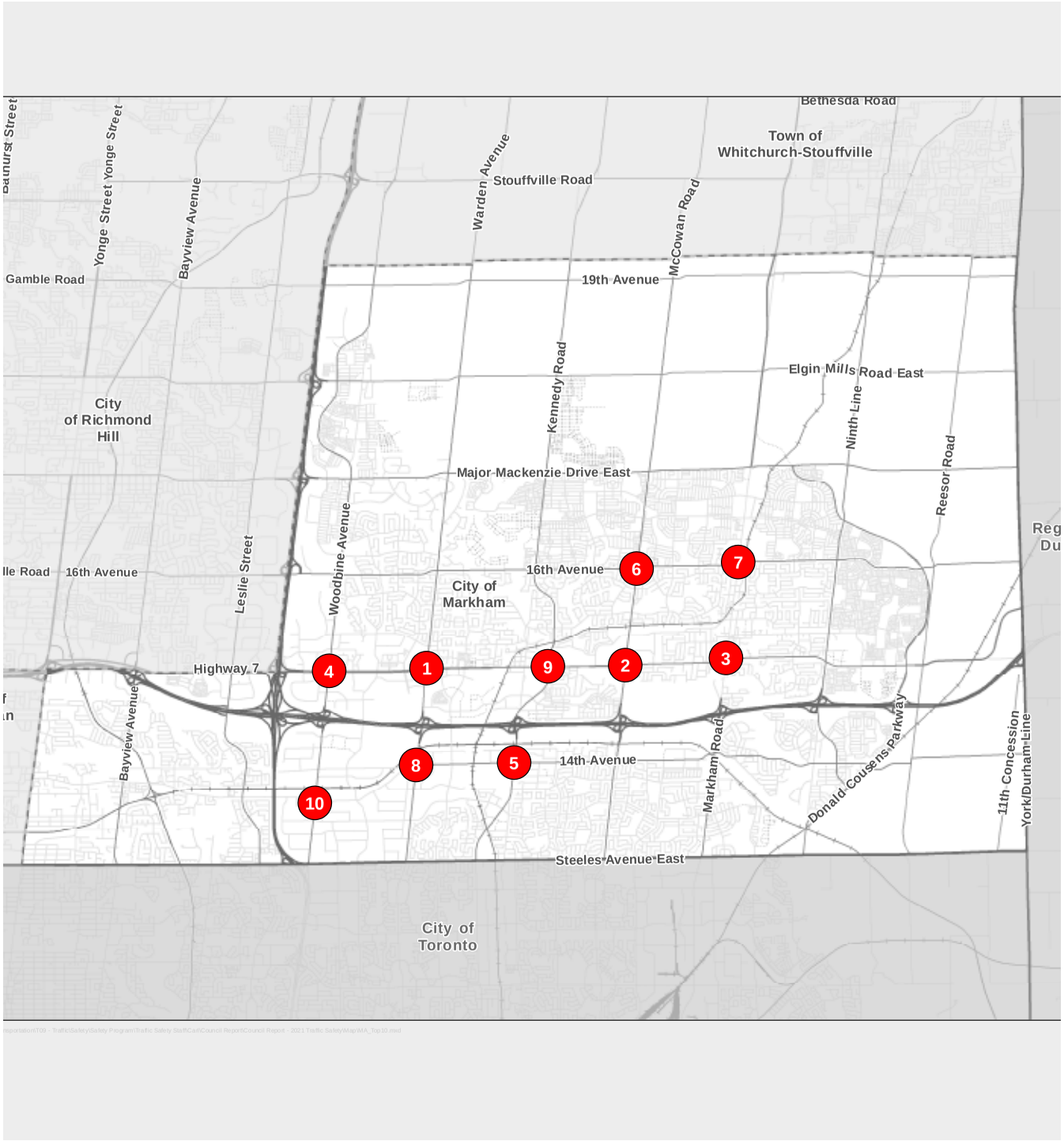


TOP 10 COLLISION LOCATIONS

TOWNSHIP OF KING

1. Davis Drive West and Bathurst Street (57)
2. King Road and Bathurst Street (36)
3. Bathurst Street and 15th Sideroad/ Bloomington Road (34)
4. 18th Sideroad and Bathurst Street/St John's Sideroad (30)
5. King Road and Jane Street (30)
6. King Road and Dufferin Street (24)
7. Highway 11 between Bathurst Street and Kalvers Street (24)
8. King Road and Highway 27 (22)
9. Wellington Street West and Bathurst Street (21)
10. Keele Street and King Road (18)

Value in the parentheses represents number of collisions between 2018 and 2020



TOP 10 COLLISION LOCATIONS

CITY OF MARKHAM

1. Highway 7 and Warden Avenue (59)
2. Highway 7 and McCowan Road (56)
3. Highway 7 and Main Street Markham South/Main Street Markham North (54)
4. Highway 7 and Woodbine Avenue (53)
5. Kennedy Road and 14th Avenue (52)
6. McCowan Road and 16th Avenue (52)
7. 16th Avenue and Main Street Markham North/Highway 48 (50)
8. Warden Avenue and 14th Avenue/ Alden Road (49)
9. Highway 7 and Kennedy Road (47)
10. Woodbine Avenue and John Street/ Esna Park Drive (46)

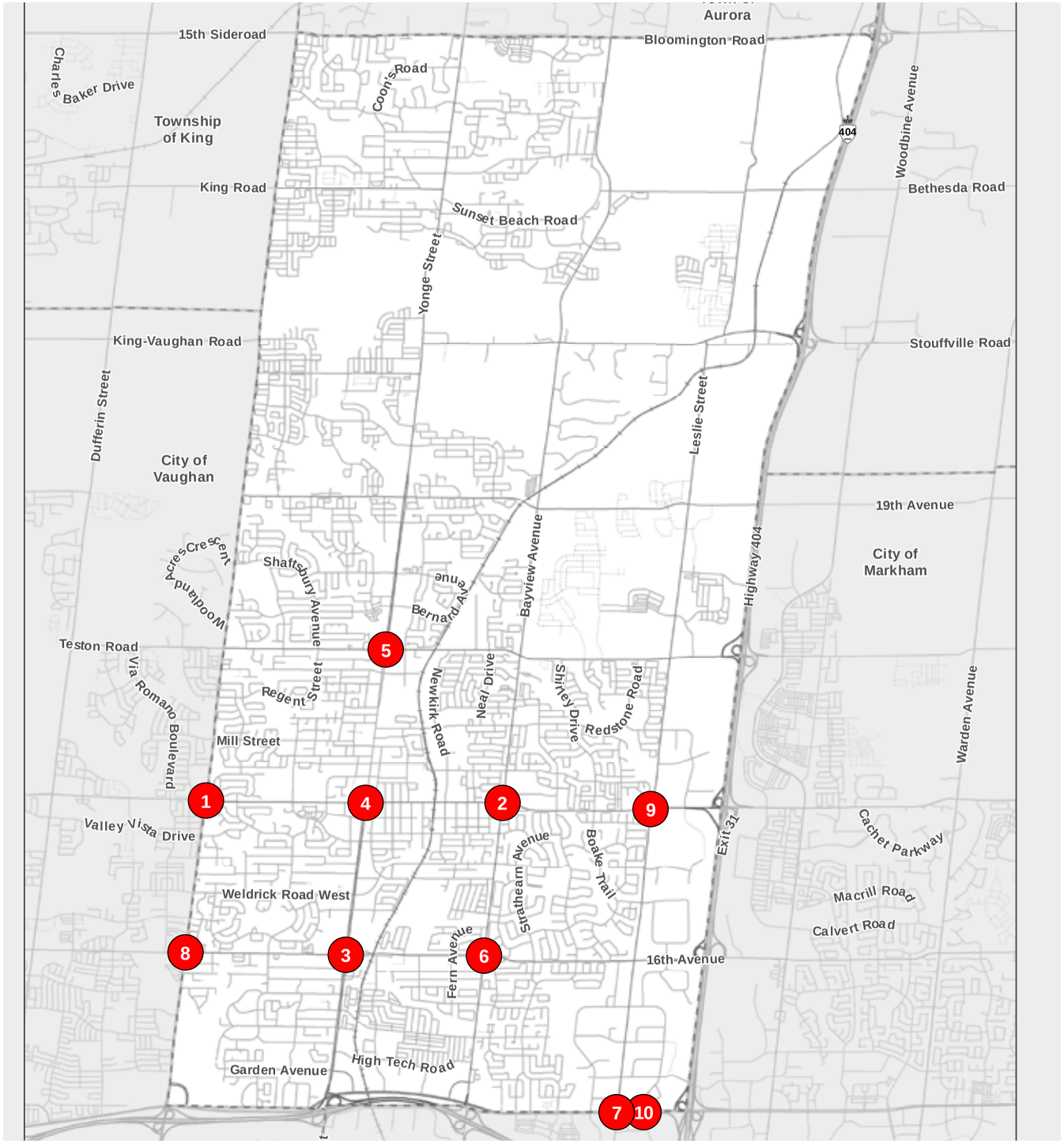
Value in the parentheses represents number of collisions between 2018 and 2020

TOP 10 COLLISION LOCATIONS

TOWN OF NEWMARKET

1. Davis Drive West and Bathurst Street (57)
2. Yonge Street and Davis Drive/Davis Drive West (45)
3. Yonge Street and Mulock Drive (40)
4. Prospect Street and Bayview Avenue/ Mulock Drive (39)
5. Leslie Street and Davis Drive (37)
6. Yonge Street and Kingston Road/Dawson Manor Boulevard (28)
7. Yonge Street and Eagle Street/ Eagle Street West (28)
8. Davis Drive and Lundy's Lane/ Prospect Street (27)
9. Davis Drive and Harry Walker Parkway/ Harry Walker Parkway South (24)
10. Yonge Street and London Road/ Bonshaw Avenue (23)

Value in the parentheses represents number of collisions between 2018 and 2020



TOP 10 COLLISION LOCATIONS

CITY OF RICHMOND HILL

1. Major Mackenzie Drive West and Bathurst Street (61)
2. Major Mackenzie Drive East and Bayview Avenue (60)
3. Yonge Street and Carrville Road/16th Avenue (57)
4. Yonge Street and Major Mackenzie Drive West/Major Mackenzie Drive East (55)
5. Yonge Street and Elgin Mills Road West/Elgin Mills Road East (54)
6. Bayview Avenue and 16th Avenue (47)
7. Highway 7 and Leslie Street (45)
8. Bathurst Street and Carrville Road/ Rutherford Road (44)
9. Leslie Street and Major Mackenzie Drive East (40)
10. Highway 7 and Commerce Valley Drive East/East Beaver Creek Road (39)

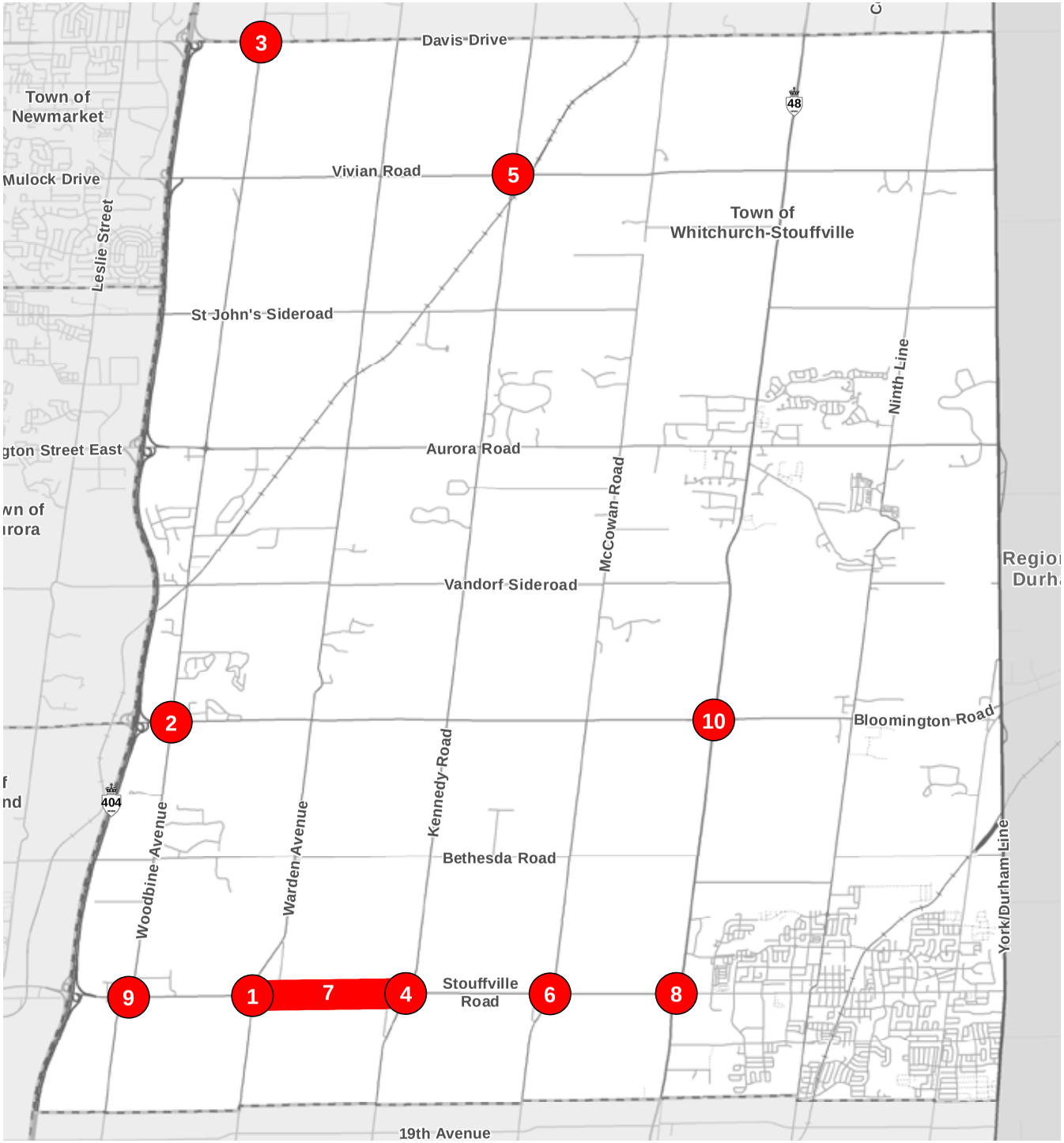
Value in the parentheses represents number of collisions between 2018 and 2020

TOP 10 COLLISION LOCATIONS

CITY OF VAUGHAN

1. Islington Avenue and Rutherford Road (85)
2. Keele Street and Highway 7 (85)
3. Highway 7 and Weston Road (82)
4. Highway 7 and Jane Street (68)
5. Highway 7 between Huntington Road and Highway 427 - Highway 7 Ramp (67)
6. Weston Road and Rutherford Road (66)
7. Highway 27 and Rutherford Road (63)
8. Rutherford Road and Sweetriver Boulevard (63)
9. Major Mackenzie Drive West and Bathurst Street (61)
10. Major Mackenzie Drive West and Jane Street (60)

Value in the parentheses represents number of collisions between 2018 and 2020



TOP 10 COLLISION LOCATIONS

TOWN OF WHITCHURCH-STOUFFVILLE

1. Stouffville Road and Warden Avenue (28)
2. Woodbine Avenue and Bloomington Road (15)
3. Woodbine Avenue and Davis Drive (14)
4. Kennedy Road and Stouffville Road (13)
5. Kennedy Road and Vivian Road (13)
6. Stouffville Road and McCowan Road (13)
7. Stouffville Road between Warden Avenue and Kennedy Road (13)
8. Stouffville Road and Main Street/ Highway 48 (13)
9. Woodbine Avenue and Stouffville Road (13)
10. Bloomington Road and Highway 48 (13)

Value in the parentheses represents number of collisions between 2018 and 2020

TRANSPORTATION SERVICES

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York Region