

The Regional Municipality of York

Committee of the Whole
Transportation Services
June 13, 2019

Report of the Commissioner of Transportation Services

Pedestrian and Cyclist Safety Improvements

1. Recommendation

Council receive this report for information.

2. Summary

This report provides Council with a plan to improve pedestrian and cyclist safety.

Key Points:

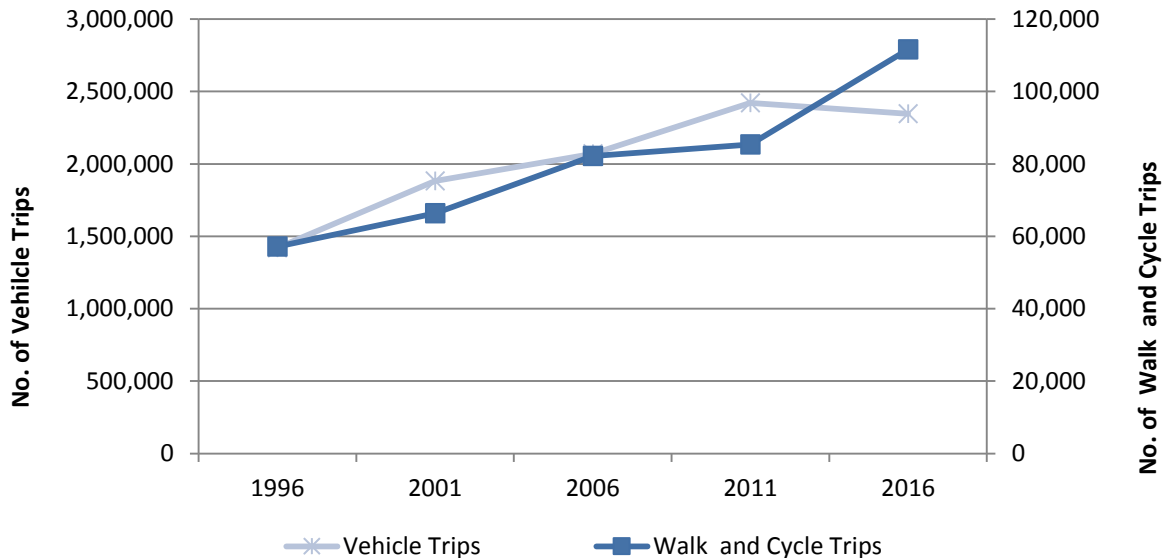
- A quantitative data and predictive approach was taken to evaluate risk exposure to pedestrians and cyclists
- Study results indicate that pedestrians and cyclists are at risk with turning vehicles at signalized intersections on Regional roads
- A suite of operational measures were evaluated and selected based on effectiveness, applicability to Regional roads and implementation time frame
- A pedestrian and cyclist safety index was developed to prioritize the Region's signalized intersections based on risk exposure to pedestrians and cyclists
- Operational measures will be implemented and evaluated to support further implementation, which may influence driver behaviour and create a safer environment for pedestrians and cyclists

3. Background

York Region residents are choosing to walk and cycle more

Based on information from the most recent Transportation Tomorrow Survey in 2016, active modes of transportation, including walking and cycling trips, have been increasing at a higher rate in comparison to vehicle trips over the last decade in York Region (Figure 1).

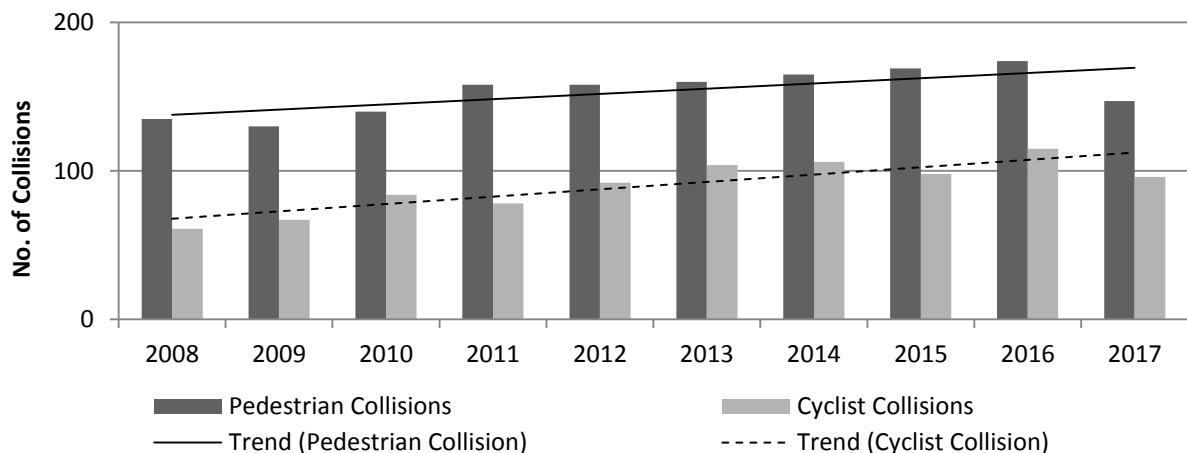
Figure 1
Daily Walking and Cycling and Vehicle Trips in York Region



Pedestrian and cyclist collisions are increasing in York Region and neighbouring regions

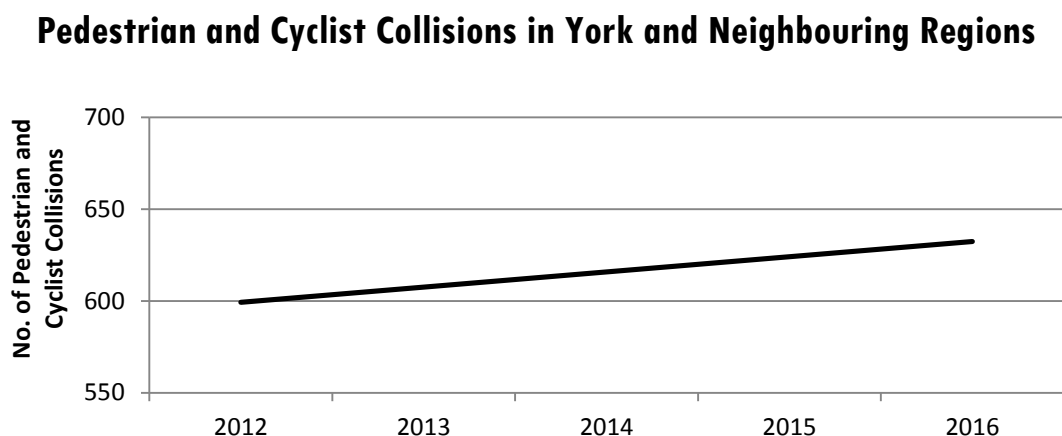
A review of pedestrian and cyclist collision statistics over the past 10 years shows that pedestrian and cyclist collisions are on the rise in York Region (Figure 2). The increase in pedestrian and cyclist collisions is likely related to the increase in active modes of transportation and the corresponding interaction between pedestrians and cyclists with vehicles.

Figure 2
Pedestrian and Cyclist Collision Statistics between 2008 and 2017



This is not exclusive to York Region. Pedestrian and cyclist collision data collected from neighbouring regions shows a generally increasing trend from 2012 to 2016 (Figure 3). Collision experience indicates that operational measures need to be considered to improve pedestrian and cyclist safety.

Figure 3



The Region is applying The Pedestrian and Cycling Planning and Design Guidelines, including operational measures, to help enhance pedestrian and cyclist safety

York Region Official Plan 2016, Section 7.2 Moving People and Goods, Active Transportation, has active transportation policies of Council to update and apply the York Region Pedestrian and Cycling Master Plan's Planning and Design Guidelines in the implementation of the Regional pedestrian and cycling network. The Regional Pedestrian and Cycling Planning and Design Guidelines is currently being finalized to provide a comprehensive manual for the planning and design of active transportation facilities in the Region. The guidelines reflect an emphasis on facility types, emerging design treatments for intersections and better integration with other Regional planning and design initiatives to create safe environments for pedestrians and cyclists. Based on these guidelines, road and intersection improvements have been and continue to be undertaken to enhance safety for pedestrian and cyclists. These operational measures include:

- Pedestrian-accessible intersections compliant with the Accessibility for Ontarians with Disabilities Act
- Tighter intersection curb radii in urban areas to slow turning vehicles and decrease the crossing distance for pedestrians
- More crossing time for pedestrians allocated at signalized intersections
- High visibility crossings to highlight potential pedestrians at intersections
- Pedestrian countdown signals to provide more awareness for pedestrians

- Leading pedestrian interval traffic signals to allow pedestrians a 'head start' when crossing
- Additional warning signage
- Testing of responsive pedestrian crossing devices to allow intersections to identify the presence of pedestrians without the need to press a button
- Separated bike facilities

Staff committed to undertake further analysis to identify operational measures to improve pedestrian and cyclist safety

The [2017 Traveller Safety Report](#) highlighted that pedestrians and cyclists are more likely to be injured or killed when involved in collisions, despite that motorists account for the majority of trips and vehicle-only collisions significantly outnumber collisions involving pedestrians and cyclists.

More than 90 per cent of all collisions involving pedestrians and more than 80 per cent of all collisions involving cyclists resulted in injuries or fatalities. Collision statistics also showed that pedestrian and cyclist collisions primarily occurred at signalized intersections, with approximately 80 per cent involving pedestrians and 60 per cent involving cyclists. Staff committed to undertake further analysis to identify and consider potential strategies and operational measures to address pedestrian and cyclist safety.

4. Analysis

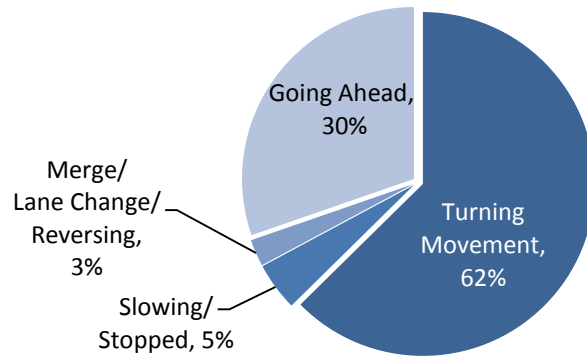
A quantitative data and predictive approach was taken to evaluate risk exposure to pedestrians and cyclists

The National Cooperative Highway Research Program, administered by the Transportation Research Board, has developed a quantitative and predictive approach to evaluate pedestrian and cyclists safety that not only addresses locations with prior collision occurrence, but also determines high impact locations based on risk characteristics, demand and roadway environment. A consultant was retained to assist in the evaluation and the report is included as Attachment 1.

Study results indicate that pedestrians and cyclists are at risk with turning vehicles at signalized intersections on Regional roads

Regional collision statistics show that 62 per cent of all pedestrian and cyclist collisions involve a turning vehicle (Figure 4). For pedestrians, left-turning vehicles account for 36 per cent, while right-turning vehicles account for 30 per cent. For cyclist collisions, right-turning vehicles account for close to 50 per cent, while left-turning vehicles account for 14 per cent.

Figure 4
Vehicle Maneuver in Pedestrian and Cyclist Collisions







A suite of operational measures were evaluated and selected based on effectiveness, applicability to Regional roads and implementation time frame

An industry scan across North America identified a suite of operational measures that have been tested and proven to help improve pedestrian and cyclist safety. Some are already being implemented through Regional road construction projects such as bike boxes, controlled mid-block crossings and enhanced green pavement markings, and should be considered more broadly. Details of each operational improvement are included in Attachment 1.

Staff reviewed the industry-reported operational measures and selected measures to address high impact collisions involving pedestrians and cyclists that are turning movement conflicts at signalized intersections. Effectiveness, applicability to Regional roads and implementation time frame were considered as well. Recommended operational measures include prohibit right turn on red, protected left turn movement, leading pedestrian interval and additional warning signage. A description and potential safety benefit of each operational measure selected is outlined in Table 1.

Table 1
Pedestrian and Cyclist Operational Measures

Operational Measures		Description	Potential Safety Benefits *
Prohibit right turn on red		Reduces conflicts with pedestrians who are crossing perpendicular to the vehicle direction	Up to 8 per cent reduction in overall collisions
Protected left turn movement		Left turning vehicles are given exclusive right-of-way independent of pedestrian crossing time	68 per cent reduction in all collisions involving left-turning vehicles
Leading Pedestrian Traffic Signal Intervals		Pedestrians can better establish their presence in the crossing by entering an intersection approximately seven seconds before vehicles	59 per cent reduction in pedestrian-vehicle collisions
Additional Warning Signage		Signs informing motorists that pedestrians and cyclists have the right-of-way within the intersection	40 per cent reduction in overall collisions

* Safety Benefits reported through industry analysis and experience (Crash Modification Factors)

A pedestrian and cyclist safety index was developed to prioritize Regional signalized intersections based on risk exposure to pedestrians and cyclists

The principles of the National Cooperative Highway Research Program approach has been used in the development of a pedestrian and cyclist safety index to prioritize signalized intersections on Regional roads. The index consists of a weighted score taking into consideration variables such as road characteristic, road user volume, crossing distance, speed limit and environment. The factors and their variables are listed in Table 2.

Table 2
Factors and Variables Included in the Pedestrian and Cyclist Safety Index

Factors	Variables
Safety	Total pedestrian and cyclist collisions (10 years)
	Potential for safety improvement
Demand	Pedestrian and cyclist volume
	Proximity to schools, community centre, commercial development
	Proximity to transit
	Nearby population density
Road Environment	Traffic volume
	Turning volume
	Speed limit
	Pedestrian crossing distance

Operational measures will be implemented and evaluated to support further implementation, which may influence driver behaviour and create a safer environment for pedestrians and cyclists

Locations scoring within the top 20 per cent of the pedestrian and cyclist safety index were further analyzed to consider traffic operation impacts such as delay, queuing and potential for neighbourhood infiltration. Locations with high traffic operation impacts and/or under construction were excluded. Four intersections were selected for implementation of the recommended operational measures starting this summer, in time for the new school year in September. Table 3 lists the four intersections and operational measures being implemented.

Table 3
Intersections with Highest Risk Exposure to Pedestrians and Cyclists

Intersection and Time Line	Critical Crosswalk	No Right Turns on Red	Protected Left Turn	Leading Pedestrian Interval	Warning Signage and Enforcement
Major Mackenzie Drive (Y.R. 25) and Bayview Avenue (Y.R. 34)	East	Westbound Right Turn	Southbound Left Turn		√
Yonge Street (Y.R. 1) and Clark Avenue	North	Southbound Right Turn		√	√
Bathurst Street (Y.R. 38) and Carrville Road/Rutherford Road (Y.R. 73)	West	Eastbound Right Turn		√	√
Bathurst Street (Y.R. 38) and Clark Avenue	West	Eastbound Right Turn	Northbound Left Turn		√

Staff will perform ongoing monitoring of these operational measures over a period of one year to evaluate safety benefits and understand corresponding impacts on vehicular traffic. Evaluation criteria include impacts to traffic operations, travel time increase, traffic delay, queuing, etc. Before and after video conflict analysis will also be used to compare near-miss and close-call incidents to measure potential collision risk. Based on the results, these operational measures will be considered for permanent installation as well as applicability at other locations.

York Region continues to build partnerships with stakeholders to promote operational measures to improve pedestrian and cyclist safety

Staff has worked on a number of safety initiatives in collaboration with local municipalities, York Regional Police, Public Health, Public School Boards, the Province, Canadian Automobile Association and surrounding cities. The community was engaged through visits to senior homes, schools and community events to provide safety information, such as driver-focused education programs to influence driver behaviour. Citizen feedback has been positive.

Building on this success and these partnerships, the Region will launch a pedestrian and cyclist safety campaign to highlight the operational measures outlined in this report and to gather citizen feedback. The safety campaign will take place during the summer in conjunction with the implementation of the operational measures and will include on-site public outreach to highlight the operational measures.

5. Financial

The Region continues to monitor and analyze traffic operations and data to ensure investments in the Regional road network are optimized. Costs of these activities are included in the 2019 approved Transportation Services Operating Budget.

6. Local Impact

With increased Regional urbanization and growth in the use of active transportation modes, balancing the demands and reducing potential conflicts between all road users benefits all our communities. Although an impact to driver delay is recognized, the Region's commitment to traveller safety has been established as a high priority. The Region is committed to working with local partners to find efficiencies in the road network and enhance public safety.

Staff will continue to work with local municipalities, York Regional Police, York Region Transit, Public Health and Public School Boards to identify strategies and operational measures to address the traveller safety experience for all road users.

The selected operational measures have been shared with local municipal staff and findings of the ongoing monitoring and evaluation will be shared once available.

7. Conclusion

Recognizing that walking and cycling trips are growing and collisions are on the rise, staff committed to undertake analysis to improve pedestrian and cyclist safety and report back to Council.

A quantitative data and predictive approach was taken to evaluate risk exposure to pedestrians and cyclists. Study results indicate that pedestrians and cyclists are at risk with turning vehicles at signalized intersections on Regional roads. A suite of operational measures were evaluated and selected based on effectiveness, applicability to Regional roads and implementation time frames. A pedestrian and cyclist safety index was developed to prioritize Regional signalized intersections based on risk exposure to pedestrians and cyclists. Operational measures will be implemented and evaluated to support further implementation, which may influence driver behaviour and create a safer environment for pedestrians and cyclists.

For more information on this report, please contact Joseph Petrungaro at 1-877-464-9675 ext. 75220. Accessible formats or communication supports are available upon request.

Recommended by: **Paul Jankowski**
Commissioner of Transportation Services

Approved for Submission: **Bruce Macgregor**
Chief Administrative Officer

May 29, 2019
Attachment (1)
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