



Report to: Development Services Committee

Meeting Date: September 29, 2020

SUBJECT:	Road Safety Update - Traffic Safety Audit Results (City-wide)
PREPARED BY:	David Porretta, Manager, Traffic Engineering, Ext. 2040 Justin Chin, Traffic Engineer, Traffic Engineering, Ext. 4020
REVIEWED BY:	Loy Cheah, Senior Manager, Transportation, Ext. 4838

RECOMMENDATION:

1. That the report entitled “Road Safety Update - Traffic Safety Audit Results (City-wide)” and presentation entitled “Traffic Safety Audit Results”, be received; and
2. That staff be directed to explore new traffic calming measures to address vehicle speed and traffic infiltration on City streets, and to report back prior to conducting pilot projects; and
3. That the City Clerk send a copy of this report and Council resolution to York Region; and further
4. That staff be authorized and directed to do all things necessary to give effect to this resolution.

EXECUTIVE SUMMARY:

As the City continues to grow and modes of transportation become more diverse, there is a need for a different approach to how Markham addresses road safety. A “Safe Systems” strategy will plan for the implementation of safety measures that are data-driven in order to increase road safety for all road users, most notably cyclists and pedestrians as they are most vulnerable to serious injury and death when involved in a motor vehicle collision.

The process to achieve this objective begins with a city-wide traffic safety audit in order to identify the existing areas of concern as well as locations that have a high risk of collisions. The audit analyzed collision data over a five-year period (2014-2018).

The audit confirmed that a high percentage of collisions on City streets occur at signalized intersections, 4-lane roads and on streets with a posted speed limit of 50 km/h. There is an upward trend in the frequency of pedestrian collisions, and close to half of all pedestrian and cyclist collisions occurred at signalized intersections.

The Denison Street and Main Street Markham corridors were identified as areas of concern with Denison Street having a high number of collision risk factors. Risk factors

include high traffic volumes, road cross-section and geometric elements, presence of transit stops, and being four-lane major collector roads.

When comparing the safety performance of Markham with select Ontario municipalities, Markham saw the lowest number of overall injury collisions, however, there is a higher probability of being injured in the event of a collision.

The traffic safety audit results highlight the need for a “Safe Systems” road safety plan specific to the needs of the City of Markham.

As the use of active transportation increases across the City, staff continue to collaborate with the Cycling and Pedestrian Advisory Committee (CPAC) on potential initiatives to improve safety and raise awareness related to active transportation. Corporate Communications & Community Engagement is also a key partner on a campaign aimed at educating the public on road and school zone safety and promoting existing traffic safety programs such as “Road Watch” and speed display board deployments. These ongoing efforts, in parallel with the development of a road safety plan, will enhance existing traffic safety programs and improve the overall safety of Markham’s transportation network.

PURPOSE:

This report provides the results of the City-wide traffic safety audit and next steps to develop a road safety plan for Markham.

BACKGROUND:

A fundamental shift in attitude toward road safety and mobility is required

At the March 18, 2019 Development Services Committee meeting, City staff brought forward an information memorandum, entitled “Road Safety in Markham (City-wide)”. That memorandum provided an overview of the existing traffic safety strategies, and emphasized the need for a fundamental shift in attitude toward road safety. The City’s goal of reducing the severity of collisions for all road users, including pedestrians and cyclists will be achieved through the following:

- Planning for the transition from a primarily car-dependent community to one where transit and active transportation are becoming increasingly viable and attractive alternate modes of travel;
- The need to prioritize the safety of all road users, particularly pedestrians and cyclists, over the expeditious movement of motorized vehicles;
- The development of an enhanced road safety plan to identify and treat areas with high rates of collisions as well as those with high risk of collisions by determining appropriate measures to address them; and

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- The continuation of a partnership with York Region to ensure a common approach and consensus on priorities, roles, responsibilities, and implementation of associated road safety projects, programs and initiatives.

A “Safe Systems” approach to road safety is needed

Most road authorities and public agencies, including Markham, manage the safety performance of the road system through five pillars: Education, Encouragement, Enforcement, Evaluation and Engineering. Markham safety initiatives are based on a combination of these five pillars. Although these initiatives have been successful on many levels, many jurisdictions are now shifting their approach towards a “safe systems” approach to road safety, which includes the “Vision Zero” approach.

A “Safe Systems” approach to road safety is based on the principle that no serious injuries or deaths should be acceptable. Data-driven and evidence-based measures are used to reduce the number of collisions. Conducting a City-wide traffic safety audit is the first step in developing a comprehensive, data-driven road safety strategy.

A City-wide Traffic Safety Audit was initiated in September 2019 and is now completed

In September 2019, City staff retained CIMA+ (the Consultant) to conduct a City-wide traffic safety audit. The primary tasks of this audit included:

- Collection and review of all City road infrastructure, traffic data and collision data (2014 – 2018);
- Collision network screening and safety risk analysis;
- Review of collision prone locations;
- Evaluating and comparing the City’s overall safety performance;
- Identify a series of counter-measures to mitigate specific road safety issues;
- Develop the Terms of Reference for a Road Safety Plan;

The traffic safety audit is now completed and the results are presented in this report.

OPTIONS/ DISCUSSION:

The City of Markham has a substantial traffic data and collision database for the transportation network under its jurisdiction. The City’s traffic data and York Regional Police collision reports over a 5-year period (January 2014 to December 2018) were compiled, reviewed for data quality, and processed. About 2,000 individual road segments and 1,000 intersections were included in the scope of the audit.

Traffic Safety Audit Key Findings

In the 5-year analysis period (2014 – 2018), approximately 4,400 collisions occurred on the City’s road network. The following are highlights of the findings.

- **Collision Severity**

- 25% of all collisions resulted in injury;
- 37 collisions (3.4%) resulted in major injury (i.e. requiring hospital admission);
- One fatality (pedestrian) occurred during the period;
- Majority of injury collisions occurred during daylight hours under good road/weather conditions.

- **Intersection Collisions**

- There is a slight decreasing trend in the number of injury collisions at intersections. The average number of intersection collisions is 138 per year;
- 50% of all intersection collisions occur at signalized intersections; the City has approximately 101 signalized intersections which makes up 5% of the analyzed intersections;
- Angle collisions are the most frequent collision type. Angle collisions are defined as 90 degree vehicular impacts and are frequently associated with injuries;
- Highest concentration of intersection collisions occur on the Denison Street and Main Street Markham corridors.

- **Mid-block (Road Segment) Collisions**

- There is an increasing trend in the number of injury collisions at mid-block locations. The average number of mid-block collisions is 78 per year;
- 23% of collisions occur on 4-lane, 50 km/h posted roads, yet 4-lane roads with 50 km/h speed limits comprise only 3% of the City's road network;
- 12% of collisions occur on 2-lane, 50 km/h posted roads, yet these road segments comprise only 3% of the City's road network;
- Most injuries are from single motor vehicle (SMV) collisions; and most vehicle-pedestrian collisions are typically reported as single motor vehicle collisions.

- **Pedestrian Collisions**

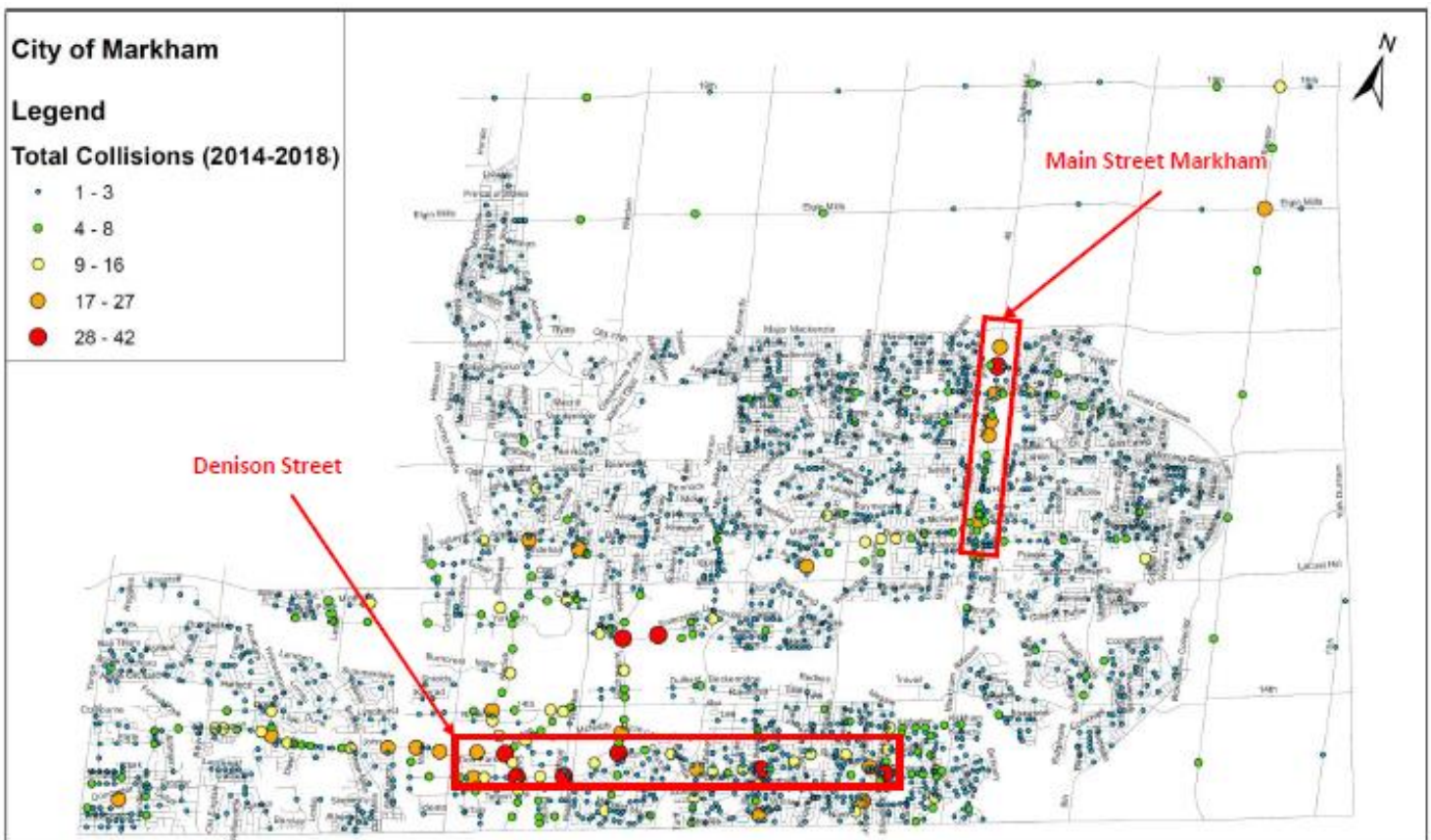
- There is a modest increasing trend in the number of pedestrian collisions. The average number of pedestrian injury collisions is 41 per year;
- Highest concentration of pedestrian collisions occurs in the Milliken area, particularly on the Denison Street corridor;
- 44% of pedestrian collisions occur at signalized intersections;
- 22% of all pedestrian collisions occur on roads with 4+ lanes, yet 4-lane roads comprise only 4% of the City's road network;
- Most pedestrian injury collisions occur during non-daylight conditions.

- **Cyclist Collisions**

- Since 2015, there is a decreasing trend in the number of cyclist collisions. The average number of cyclist injury collisions is 23 per year;
- Highest concentration of cyclist collisions occurs in the Milliken area, particularly on the Denison Street corridor;
- 45% of cyclist collisions occur at signalized intersections;
- 37% of all cyclist collisions occur on roads with 4+ lanes, yet 4-lane roads comprise only 4% of the City's road network;
- Most cyclist injury collisions occur in the summer-fall months during the AM peak period.

The geographical distribution of collisions was also analyzed to determine areas that contained the highest concentrations of collisions. These collision clusters are presented in **Figure 1**.

Figure 1: Geographic Distribution of Total Collisions in Markham (2014-2018)



Areas of highest concentration of collisions are the Denison Street corridor between Woodbine Avenue and Markham Road and the Main Street Markham corridor between Highway 7 and Major Mackenzie Drive. A significant number of collisions occurs at either

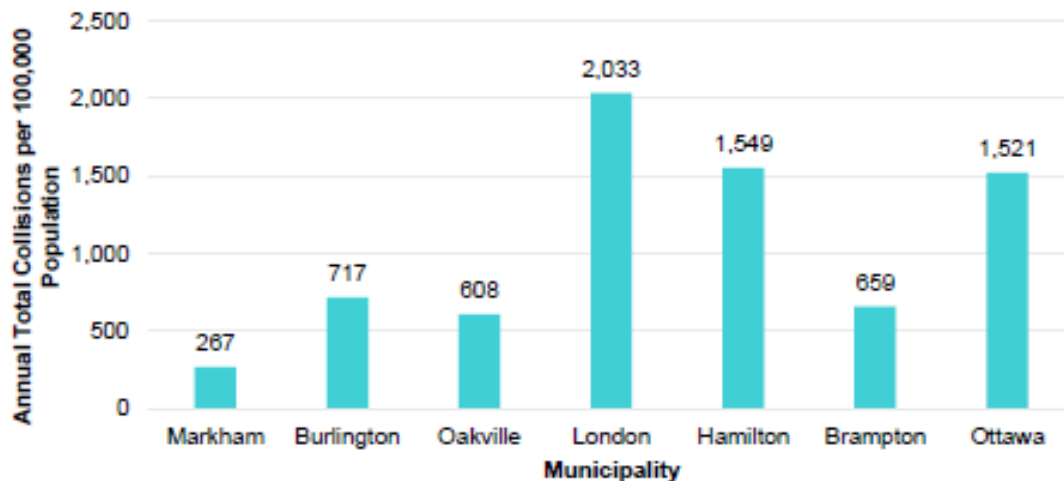
signalized intersections or on road segments with a posted speed limit of 50 km/h, despite making up only 5% and 6% of City facilities, respectively.

Denison Street is ranked as having high risk factors for all road users. These risk factors include high traffic volumes, road cross-section and geometric elements, presence of transit stops, and being four-lane major collector roads. Cyclists also experienced more collisions on Denison Street, which may be associated with the lack of dedicated cycling infrastructure along the corridor, and a higher number of cyclists.

Markham compares well with peer municipalities on road safety but more needs to be done to reduce the risk of injuries

The following compares the road safety performance of Markham with select municipalities in Ontario. A summary of total collisions is shown in **Figure 2** below.

Figure 2: Annual Total Collisions (per 100,000 population)



Markham compares well, however it should be noted that the Cities of London, Hamilton and Ottawa are single-tier municipalities that are responsible for all arterial roads and some expressways and also have a more developed transportation system of roads, transit and cycling facilities and services.

The proportion of injury collisions to total collisions was also calculated. Between the years 2014 and 2018, 24.6% of all collisions in Markham resulted in injuries. This percentage is similar to the Regional percentage of 26.5%, but it is higher than the other municipalities selected as shown in **Figure 3** below.

Figure 3: Proportion of Injury Collisions to Total Collisions (2014-2018)

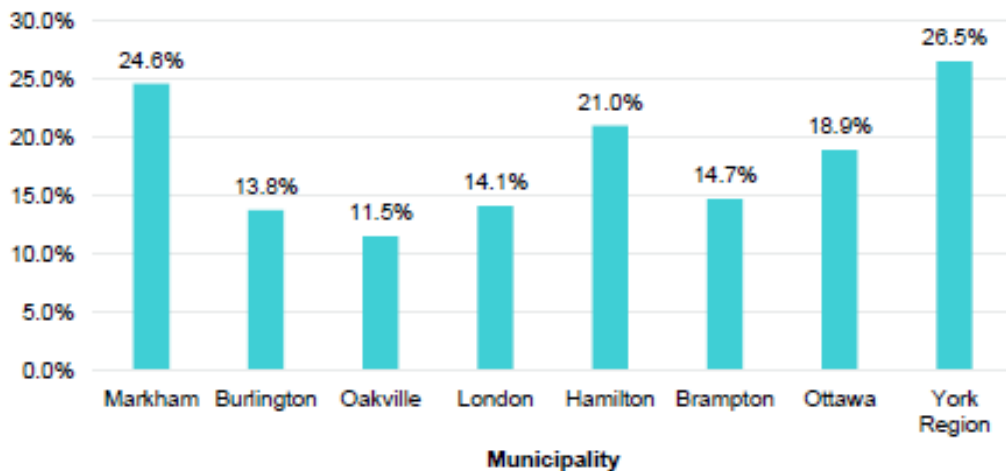


Figure 3 shows that collisions are more likely to result in injury in comparison to the other municipalities. However, given the lower number of collisions in Markham, the number of annual injury collisions in Markham is still the lowest in comparison.

It should be noted that other lower tier municipalities within York Region have not adopted formal road safety plans and do not have published road safety statistics. The City of Markham is in a position to become a leader for objectively addressing areas of existing concern and proactively addressing high-risk collision areas with the ultimate goal of creating a safe transportation network for all road users across the City.

The City is working with the Cycling & Pedestrian Advisory Committee (CPAC) on active transportation safety strategies

A CPAC meeting was held on July 16, 2020, to discuss the issue of vulnerable road user (pedestrian and cyclist) safety across the City. Recognizing that active transportation is increasing in Markham, a motion was passed to recommend to Development Services Committee to direct staff to expedite the study and potential implementation of low cost safety measures, within existing budgets.

A subsequent meeting was held on August 6, 2020 to refine and prioritize the initial long list of safety measures. At that meeting, CPAC recommended that staff further study the feasibility of implementing the following three priority measures:

1. Speed limit reductions to 30 km/h on key local roads or neighbourhoods;
2. Install flexible bollards on roadways with white edge-line pavement markings at strategic locations (e.g. near intersections); and
3. Modify traffic signal operations at high pedestrian/cyclist locations to accommodate leading pedestrian intervals and implement no right turns on red.

Staff continue to collaborate with CPAC on these and other initiatives aimed at increasing vulnerable road user safety across the City. This ongoing effort in addition to

the development of a City-wide road safety plan will enhance and prioritize existing road safety programs and pilot new and innovative measures.

A communications campaign to supplement current road safety strategies is underway

The City's current traffic safety programs of Speed Display Boards, Road Watch and School Zone Safety play an important role in raising road safety awareness and changing road users' behaviour. To complement these initiatives, Engineering staff have engaged the Corporate Communications & Community Engagement team to develop an educational campaign to explain safety rules of the road and promote safe pathways and trails usage.

Staff will be working in collaboration with York Region and York Regional Police to ensure that the public education campaign and its key messages are consistent and complementary across all organizations.

The traffic safety audit highlights the need for a "Safe Systems" road safety plan specific to the needs of the City of Markham

The traffic safety audit has revealed the safety issues for vulnerable road users in Markham. Through the development of a road safety plan customized to meet the specific safety requirements of Markham, the City will be able to prioritize site-specific safety measures through the "Safe Systems" approach.

The main outcome of the road safety plan will be an implementation plan of City-wide safety measures defined by a set of specific and measureable goals such as annual safety targets.

To ensure broad support for the road safety plan, it will need to improve safety to all aspects of Markham's transportation network. Therefore, its development will involve key stakeholders (such as York Regional Police, York Region Transportation, Public Health, school boards) who will provide technical input within their respective areas of expertise. A detailed communications and public engagement plan will also be necessary to obtain input from the larger Markham community.

FINANCIAL CONSIDERATIONS

Staff has submitted a 2021 capital budget request for the development of the road safety plan. The development of the Plan will take approximately 18 months to complete. Completion of the road safety plan will inform the programming of future capital project budgets on road safety.

HUMAN RESOURCES CONSIDERATIONS

Development of the road safety plan will not require additional staffing requirements.

Additional staffing requirements to facilitate implementation and on-going management of the road safety plan will be considered over the course of its development while assessing existing staff resources and prioritization of other work.

ALIGNMENT WITH STRATEGIC PRIORITIES:

The recommendations identified are intended to improve road safety for all road users, particularly pedestrians and cyclists, using a data-driven approach, and that recognizes serious injuries or deaths on the municipal road network is not acceptable. Therefore, the recommendations align with the City's Strategic Plan goal of a "Safe & Sustainable Community".

BUSINESS UNITS CONSULTED AND AFFECTED:

Not applicable.

RECOMMENDED BY:

Brian Lee, P.Eng.
Director, Engineering

Arvin Prasad, MPA, RPP, MCIP
Commissioner, Development Services

ATTACHMENTS:

Attachment "A" – Traffic Safety Audit Report - Executive Summary

Attachment "B" – Traffic Safety Audit Results (Presentation)