

Traffic Safety Review - Broadview Avenue at Erindale Avenue, Broadview Avenue at Danforth Avenue and Broadview Transit Station

Date: August 24, 2020
To: Toronto and East York Community Council
From: Acting Director, Traffic Management, Transportation Services
Wards: Ward 14, Toronto - Danforth

SUMMARY

The findings of this staff report were requested to be provided to Toronto and East York Community Council.

Transportation Services staff, in response to Items TE4.81 and TE5.83, have undertaken the following actions:

- Conducted a traffic study of existing conditions for the intersection of Broadview Avenue at Erindale Avenue,
- Studied the eastbound left turning movement, as well as the collision history for the intersection of Broadview Avenue and Danforth Avenue, and
- Requested that the Toronto Transit Commission (TTC) staff study the feasibility of reconfiguring Broadview Transit Station's streetcar loop in order to accommodate two streetcars within the station's loading zones.

RECOMMENDATION

The Acting Director, Traffic Management, Transportation Services, recommends that:

1. Toronto and East York Community Council receive this report for information.

FINANCIAL IMPACT

Funding for the installation of pavement marking is available in the Transportation Services 2020 Capital Budget and is subject to competing priorities.

DECISION HISTORY

This report is in response to the Toronto and East York Community Council adopted items TE4.81 and TE5.83, which requested Transportation Services to report on the traffic study conducted at the intersection of Broadview Avenue at Erindale Avenue, the existing conditions of the eastbound left turning movement, including the collision data, for the intersection of Broadview Avenue at Danforth Avenue and potential improvements to the street car loading zones at Broadview Transit Station.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.TE4.81>
<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.TE5.83>

COMMENTS

Existing Conditions

Broadview Avenue is a minor arterial roadway that operates two-way north-south traffic on a pavement width of about 12.8 metres. The average daily traffic volume is about 15,500 vehicles and the regulatory speed limit is 50 km/h. Heavy trucks are prohibited from 7:00 p.m. of one day to 7:00 a.m. of the next following day.

Erindale Avenue is a local roadway that operates two-way traffic on a pavement width of about 12.8 metres at Broadview Avenue, narrowing to 7.2 metres east of the TTC/Green P parking lot access. The daily average traffic volume is about 2,000 vehicles and the regulatory speed limit is 30 km/h. Heavy trucks are prohibited at all times.

Danforth Avenue is a major arterial roadway that operates two-way east-west traffic on a pavement width of about 19 metres. The daily average traffic volume is about 23,500 vehicles and the regulatory speed limit is 40 km/h. Within the subject segment, heavy trucks are permitted at all times.

Broadview Avenue and Erindale Avenue intersect to form a "T" type intersection, with Erindale Avenue intersecting the east side of Broadview Avenue only.

At the south-east corner of Broadview Avenue at Erindale Avenue, and north-east of Broadview Avenue at Danforth Avenue, is Broadview Transit Station. The station is a heavy pedestrian traffic generator. TTC service is provided at this station via buses, streetcars and subway, resulting in large amounts of pedestrian traffic within the area.

Specifically, the following TTC routes service Broadview Transit Station: "Line 2 Bloor-Danforth" subway line, "504 King" streetcar, "304 King" night streetcar, 505 Dundas streetcar, "8 Broadview" bus, "62 Mortimer" bus, "87 Cosburn" bus, "100 Flemingdon Park" bus and "322 Coxwell" night bus.

Broadview Avenue at Erindale Avenue

The following is a summary of our investigations for the intersection of Broadview Avenue at Erindale Avenue.

Collision History

A review of the Toronto Police Service collision records for the intersection of Broadview Avenue and Erindale Avenue over the three-year period ending January 1, 2020, revealed that 25 collisions had occurred at or within the vicinity of Broadview Avenue and Erindale Avenue. Further review of these collisions noted that the most frequent type of collision involved on-street parked vehicles on Broadview Avenue, north of Erindale Avenue, and on Erindale Avenue, east of Broadview Avenue. Six of these collisions were recorded on the east side of Broadview Avenue and three were recorded on the west side. Four parking-related collisions occurred on Erindale Avenue. Specifically, at the intersection of Broadview Avenue and Erindale Avenue, four collisions were noted, three of which involved turning TTC vehicles. The remaining collision at the intersection involved a pedestrian crossing Broadview Avenue being struck by a southbound motorist. Injuries sustained during this collision were noted to be minimal. No other trends were noted within the collision analysis and none of the 25 collisions resulted in major or fatal injuries.

Observations and Analysis

Daytime observations at this intersection noted some concern regarding the delay incurred by westbound motorists due to occasional truck traffic on Erindale Avenue, as well as potential conflicts with north-south motorists and pedestrians. Area residents' expressed concerns regarding unprotected pedestrian crossings at Broadview Avenue at Erindale Avenue. Staff however, observed a greater number of pedestrians crossing along Broadview Avenue at various other points between Danforth Avenue and Erindale Avenue. None of the observed crossing activity warranted additional crossing protection. Additionally, pedestrian crossing protection in the form of traffic control signals is present 90 metres north of Broadview Avenue and Erindale Avenue at the intersection of Broadview Avenue and Pretoria Avenue, and 130 metres south at Broadview Avenue and Danforth Avenue.

Further concerns were noted in regards to the inability of two-way traffic to operate within the segment of Erindale Avenue east of the Green P access, due to the narrow road width being unable to accommodate one-sided on-street parking and two-way traffic.

On the south side of Danforth Avenue, about 50 metres east of Broadview Avenue, is The Danforth Music Hall. Following scheduled events at the venue, traffic volumes increase as attendees walk towards Broadview Transit Station and depart from Green P lot 078. Broadview Avenue at Erindale Avenue is often the primary exit route for motorists departing the Green P parking lot. During consultation with the communities Playter Estates Traffic Management Working Group, residents noted that the majority of the events were not creating concerning amounts of traffic. However, certain events did result in a significant amount of traffic for a short duration of time.

Traffic Control Signals

Transportation Services also reviewed the necessity of traffic control signals at the intersection of Broadview Avenue and Erindale Avenue.

Traffic counts were undertaken at the intersection of Broadview Avenue and Erindale Avenue on January 8, 2020 during the busiest eight-hour period of the day. Based on the eight-hour vehicular and pedestrian counts and the collision history, the technical justifications for the installation of the traffic control signals are satisfied to the following extent:

- Justification 1: Minimum Vehicular Volume 31 percent
- Justification 2: Delay to Cross Traffic 83 percent
- Justification 3: Collision Hazard 20 percent

To meet the technical requirements for the installation of traffic control signals, one of the Minimum Vehicular Volume or Delay to Cross Traffic justifications must be 100 percent satisfied, or any two of the three justifications must be at least 80 percent satisfied. Based on the above results, the warrant criteria for the installation of the traffic control signals at the intersection of Broadview Avenue and Erindale Avenue is not satisfied at this time.

Pavement Marking

A review of the existing pavement markings for the east approach of Broadview Avenue and Erindale Avenue, identified the following deficiencies:

- The eastbound lane was noted to be wider than the westbound lane,
- The westbound left and right turn lanes were not delineated, and
- The absence of directional lane markings near the streetcar tracks to provide a safe buffer between the TTC's new low floor light rail vehicles (LFLRV) and opposing traffic.

The revised pavement marking plan includes the reallocation of lane widths at the east approach of the intersection to provide for the designation of a westbound left and westbound right turning lanes. Additionally, the installation of a hatched median between opposing traffic will provide clear separation between eastbound traffic and the rear tail swing of a TTC LFLRV. Attachment 1 illustrates the proposed pavement marking plan of the lane designation.

Broadview Avenue at Danforth Avenue

The following is a summary of our intersection investigation at Broadview Avenue and Erindale Avenue.

Collision History

A review of the Toronto Police Service collision records for the intersection of Broadview Avenue and Danforth Avenue, over the five-year period ending January 1, 2020, revealed that 174 collisions had occurred at or within the vicinity of Broadview Avenue and Danforth Avenue. Further review of these collisions noted that 21 collisions involved the eastbound left-turning movement and lane. Seventeen of these collisions involved the eastbound left-turning lane rather than the actual turning movement. The following is how the 17 collisions were categorized:

- Nine were side-swipe collisions involving motorists attempting to enter the queue,
- Five collisions involved rear-ends within the left-turn lane,
- Two were side-swipe collisions involving motorists attempting to exit the queue, and
- One was a head-on collision involving a left-turn queued motorist and a westbound vehicle.

The remaining four collisions involved the eastbound left-turning movement within the intersection. Two collisions were noted to have occurred between eastbound left-turning vehicles and westbound cyclists. One collision was noted between an eastbound left-turning motorist and westbound motorist, as well as one collision of an eastbound motorist traveling towards the north-east corner building.

Observations and Analysis

Morning and afternoon peak studies of the eastbound left-turning movement were conducted to determine the existing condition of the eastbound left-turning movement. Currently, the signal timing plan provides a detector enabled eastbound left turn phase during all time periods, except for the A.M. peak. The eastbound left turn signal is activated by the presence of at minimum three vehicles within the left turning lane.

A.M. Peak

During the A.M. peak, it was noted that eastbound left turning traffic did experience cycle delay up to five cycles. The study portion of the City's warrant criteria for the installation of an advanced left-turn phase. However, westbound traffic volumes were noted to be very heavy. Westbound queues west of the intersection were noted to extend across the Bloor Viaduct up to the intersections at Cambridge Avenue and Danforth Avenue. The absence of the eastbound left-turn phase during the A.M. peak allows for more effective westbound flow. The addition of a dedicated -turn phase would require the reallocation of westbound time to the eastbound left-turn phase, as the protected phase would require the absence of westbound through traffic.

In addition to field observations, Synchro traffic modeling was conducted to confirm the impacts of potential signal timing adjustments. The analysis indicated that the introduction of an eastbound left-turning phase would severely inhibit the westbound movement, in addition to causing undue delay to northbound and southbound movements. As the westbound volumes are currently far greater than the eastbound volumes, westbound movements must be prioritized over eastbound movements. Additionally, the intersection was noted to be operating beyond capacity.

P.M. Peak

During the P.M. peak, extremely long eastbound queues were observed. Often the queues would extend past the 80 metre storage limits of the dedicated eastbound left-turn lane, into the inside through lane. Queue lengths were difficult to measure due to the mixing of through traffic and left-turning traffic. The eastbound left-turn phase during the P.M. period provides 22 seconds of dedicated left-turn time. However, the phase was noted to be rarely used to its full potential due to the 504 King streetcar and 505 Dundas streetcar stopped on Broadview Avenue within the eastbound left turn receiving lanes. Streetcars were noted to be waiting for the platforms at Broadview Transit Station to clear prior to entering. Typically, a phase of 22 seconds would allow for 11 motorists to conduct a left-turning movement, however due to the stopped streetcars this phase is frequently operating at about half of its intended capacity.

Synchro analysis was also conducted to determine whether there is room for reallocation of signal timing. The traffic models indicated that the intersection is functioning beyond its capacity, specifically due to the eastbound traffic volumes. Reallocation of additional time to the eastbound and eastbound left-turn phase was noted to degrade other movements, as all other movements are being provided minimum functional time. The majority of time is provided to the eastbound movements.

Broadview Transit Station

TTC was consulted in regards to the feasibility of accommodating two streetcars within Broadview Transit Station's streetcar loop. Currently, there are concerns regarding the streetcars queueing on Broadview Avenue outside of the station, resulting in capacity concerns on Broadview Avenue. TTC is aware of the capacity concerns and has been internally working on improving streetcar capacity at the transit station. They have proposed interim and permanent solutions to allow two streetcars to utilize the platform. The current configuration allows for one 504 King streetcar and one 505 Dundas streetcar to service the station at a time.

Interim Solution

It should be noted that due to the limited space at Broadview Transit Station and conflicts with the 504 King streetcars, TTC is unable to accommodate two 505 Dundas Streetcars in the station at one time in the interim. This will be addressed as part of the permanent reconfiguration.

Therefore, the interim solution will only address the 504 (southern) platform by creating space for two streetcars to serve the platform at the same time. This will be done by moving the vehicles further to the east (into the curve of the track), building a new pedestrian crossing area as well as other modifications to make the area accessible and allow for easy customer movements within the station. TTC anticipates these modifications will be completed by the end of March 2020.

TTC has also modified their Transit Control team's supervisory schedule to cover Broadview Transit Station during the A.M. and P.M. peak hours to ensure operators do not queue on Broadview Avenue and block left-turning traffic.

Permanent Solution

In 2022, the TTC plans to acquire a portion of the Green P parking lot to the east of the station which would allow for the tracks to be expanded and ultimately modify/change the design of the streetcar platforms to allow for 4 vehicles to be in the station at one time. This proposal is in the initial stages of planning and design. Comments or suggestions regarding improvements to the Broadview Transit Station should be directed to the TTC.

Councillor Paula Fletcher has been advised of the recommendation of this staff report.

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SIGNATURE

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ATTACHMENT

1. Drawing No. 421G-3477, dated September 2019

