

## **Safety Review - Bombay Avenue and Bideford Avenue/Avenue Road**

**Date:** October 23, 2017

**To:** North York Community Council

**From:** Acting Director, Transportation Services, North York District

**Wards:** Ward 10 - York - Centre

### **SUMMARY**

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As the Toronto Transit Commission (TTC) operates a transit service on Avenue Road, City Council approval of this report is required.

North York Community Council, at its meeting on September 6, 2017, directed Transportation Services to undertake a safety review at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road and to report back to North York Community Council on the findings, including enhanced intersection controls, signs, pavement markings and a lowered speed limit.

As a result of the intersection safety review, Transportation Services is recommending the installation of all-way stop control at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road. This installation will enhance safety, provide consistent guidance to motorists and pedestrians, and will have minimal impacts on traffic.

### **RECOMMENDATIONS**

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The Acting Director, Transportation Services, North York District recommends that:

1. City Council authorize all-way compulsory stop control at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road.

### **FINANCIAL IMPACT**

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All costs associated with the installation of all-way stop sign control at intersection of Bombay Avenue and Bideford Avenue/Avenue Road are included within the Transportation Services 2017 Operating Budget.

## DECISION HISTORY

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North York Community Council, at its meeting on September 6, 2017, adopted Item NY24.50 which directed Transportation Services staff to conduct a safety review at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road and report back with a Safety Plan Strategy. Such review to include potential speed limit reductions, line paintings, flashing amber beacons, traffic control signal/all-way compulsory stop control, crosswalk signals, 'watch your speed' signs and rumble strips. The Council decision can be found at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.NY24.50>

## COMMENTS

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The intersection of Bombay Avenue and Bideford Avenue/Avenue Road is controlled by stop signs on the eastbound, westbound and southbound approaches. The northbound intersection approach operates as free-flow. Pedestrian crossing lines are provided on the north and east intersection legs. There are traffic control signals located approximately 45 metres to the south, at the westbound off-ramp from Highway 401. This intersection is the north terminus of the 61 Avenue Rd North and 142 Downtown Avenue Rd Express bus routes.

Avenue Road runs north/south and is uncontrolled at its northern terminus at Bombay Avenue. It is classified as a major arterial street and has a regulatory speed limit of 50 km/h at the subject site. It consists of two northbound and two southbound lanes, separated by a raised median. The northbound lanes are uncontrolled and terminate as a shared left-turn/through lane and an exclusive right-turn lane. Additionally, a channelized right-turn loop is provided to allow northbound TTC buses access to westbound Bombay Avenue from where they are able to turn left again to travel southbound on Avenue Road. A transit stop is located within this loop.

Bombay Avenue runs east/west and is stop controlled at Bideford Avenue/Avenue Road. West of Avenue Road it is classified as a collector street and has a posted speed limit of 40 km/h. East of Avenue Road it is classified as a local street and has a regulatory speed limit of 50 km/h. Heavy trucks are prohibited at all times on Bombay Avenue.

Bideford Avenue runs north/south and is stop controlled at its southerly terminus at Bombay Avenue. It is classified as a local street and it has a regulatory speed limit of 50 km/h. Heavy trucks are prohibited at all times on Bideford Avenue.

The current non-typical traffic controls at the intersection of Bombay Avenue and Bideford Avenue/ Avenue Road are potentially problematic in as much as the right-of-way may not be clear to users. Pedestrians that are crossing east-west on the north intersection leg may believe they have the right-of-way over the northbound motorists travelling from Avenue Road to Bideford Avenue, which are not legally required to stop.

A review of Toronto Police Service collision records for the three-year period ending June 30, 2017, revealed that one collision has been reported at the intersection Bombay Avenue and Bideford Avenue/Avenue Road. This collision is considered to be susceptible to correction by the installation of an all-way stop control.

Transportation Services conducted site observations on October 3, 2017 and October 4, 2017 and confirmed that all traffic signs at this intersection are appropriate, clearly visible and in good condition.

Additionally, detailed studies were undertaken on these dates to review the northbound through traffic, the north leg pedestrian crossings and any potential conflicts between these two movements. The summarized study findings are provided in the table below.

Table 1: Intersection Observations (October 3-4, 2017)

Time Periods	Pedestrians Crossing North Leg	Northbound Through Movements	Potential Conflicts
Morning Peak (8:00 a.m. to 9:00 a.m.)	43	28	1
Off Peak (12:00 p.m. to 2:00 p.m.)	19	33	0
Afternoon Peak (4:00 p.m. to 6:00 p.m.)	39	42	2

The following observations were also made during the studies:

- approximately half of northbound traffic treated this intersection as an all-way stop;
- stop compliance for drivers travelling eastbound on Bombay Avenue was poor;
- the predominant traffic flow during the morning peak is eastbound/westbound traffic turning southbound to access Highway 401; and
- the afternoon peak observations revealed heavier northbound flow, travelling from Highway 401.

Using vehicle and pedestrian data collected during the busiest eight-hour period of October 12, 2017, Transportation Services evaluated the installation of either all-way stop control or traffic control signals at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road. A pedestrian crossover was not considered, as these devices are no longer installed on arterial roads in the City of Toronto and would not be appropriate to mix with the existing stop controls at this intersection.

In order for all-way stop control to be justified, the warrant criteria adopted by City Council must be satisfied. The criteria include collision history, total vehicle volume, combined vehicle and pedestrian volumes crossing the major road and the percentage of traffic on the major road. Unfortunately, the City of Toronto's approved warrants are only applicable to local, collector and minor arterial streets. As noted, Avenue Road is classified as a major arterial street. Generally, stop sign control is not an appropriate control on major arterial roads, although there are exceptions where an unusual geometry and pedestrian safety considerations have necessitated these installations. Furthermore, three of the four legs of the subject intersection are not major arterial roads.

Existing examples of stop sign control on a major arterial street can be found at the east and west ends of Oxtan Avenue, which travels between Avenue Road and Oriole Parkway. At these intersections, the installation of stop control was necessitated to enhance safety for pedestrians at, and in the vicinity of, these two intersections by eliminating free-flow traffic movements.

Therefore, Transportation Services assessment of all-way stop control at Bombay Avenue and Bideford Avenue/Avenue Road considered the traffic volumes by approach and the above-noted observations of pedestrian conflicts. The summarized vehicle volumes by approach and time period are provided in the table below.

Table 2: Eight-Hour Turning Movement Count (October 12, 2017)

Time Period	Intersection approach (control)			
	Northbound (free-flow)	Southbound (stop control)	Eastbound (stop control)	Westbound (stop control)
Morning Peak Hour	238	37	383	91
Afternoon Peak Hour	360	20	377	57
Eight Hour Total	2,070	188	1,999	475

Over the eight hour period, the total number of vehicles entering the intersection from the stop controlled approaches (2,662) are greater than the northbound, free-flow approach (2,070). Further, the field observations disclosed that many northbound motorists are already yielding the right-of-way to traffic on the other intersection approaches. Based on the forgoing, the installation of all-way stop control could be supported at Bombay Avenue and Bideford Avenue/Avenue Road.

Transportation Services also evaluated the potential installation of traffic control signals at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road. The recent vehicle and pedestrian counts and the collision history were compared against the technical justifications for the installation of traffic control signals. The results are summarized in the table below:

Table 3: Traffic Control Signal Justifications (October 12, 2017)

Justification	Compliance
Minimum Vehicle Volume Justification	78 percent
Delay to Cross Traffic Justification	43 percent
Collision Hazard Justification	0 percent

To justify the installation of traffic control signals, one of either the Minimum Vehicular Volume or Delay to Cross Traffic warrants must be 100 per cent satisfied, or both must be satisfied to the extent of 80 per cent. Therefore, the installation of traffic control signal at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road is not recommended.

Based on the all-way stop control and traffic control signal justifications, Transportation Services is recommending the installation of all-way stop control at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road. This installation will enhance safety and will address the potential conflicts between pedestrians crossing on the north intersection leg and northbound motorists that can proceed through the intersection without yielding. Although the spacing to the adjacent traffic control signals is far less than ideal, the potential safety concerns should be given precedence over the increased delays to northbound traffic flow.

Capacity analysis has indicated that the proposed all-way stop control at this intersection will operate well, and that maximum queues of northbound motorists will not exceed the available storage to the traffic control signals at the westbound off-ramp from Highway 401

In addition to the recommendation of all-way stop sign control, other intersection enhancements at Bombay Avenue and Bideford Avenue/ Avenue Road were reviewed, including rumble strips, flashing beacons and enhanced signs and pavement markings.

Due to the noise and vibration concerns, rumble strips are generally not recommended for installation in residential areas.

Provincial guidelines state that flashing amber beacons are generally installed to draw motorists' attention to the presence of a warning sign, when the visibility distance is reduced due to severe roadway geometry, or other circumstances are present which suggest that greater emphasis is required. Use of flashing beacons should be restricted to critical situations only, otherwise their impact is diluted. Furthermore, they should not be used in close proximity to other traffic devices, such as the adjacent traffic control signals.

In view of the forgoing, flashing amber beacons are not supported at the intersection of Bombay Avenue and Bideford Avenue/Avenue Road, due to the absence of the following conditions:

- A major intersection that is hidden by a sharp curve or severe grade;
- A dividend highway (medians) begins;
- A physical obstruction in the roadway; or
- A sharp curve in the roadway.

Generally, the existing pavement markings are appropriate and no further changes are required under the current geometry. However, with the addition of all-way stop control, a stopbar would be installed for northbound motorists and consideration would be given to installing pedestrian crossing lines on the south and west intersection legs. Presently, these pedestrian crossing lines would not be supported, given the lack of a sidewalk on the southwest corner of the intersection. However, Transportation Services is also evaluating the installation of a concrete pad on this corner that would allow for these crossing lines to be installed. This work would also necessitate changes to the median island on Avenue Road to facilitate the east-west pedestrian crossing.

Finally, staff evaluated the potential for traffic calming measures. These would not be appropriate on Avenue Road, as there is currently TTC service provided. However, a separate review has been initiated to evaluate this installation on Bideford Avenue, north of Bombay Avenue. These studies are ongoing.

Because of the proximity of the subject site to a Highway 401 ramp access, the MTO Traffic Supervisor for Toronto-Durham, Provincial Highways Management has been advised of the recommended installation of all-way stop control at Bombay Avenue and Bideford Avenue/Avenue Road, given the proximity of this intersection to the westbound off-ramp from Highway 401 to Avenue Road, and no opposition or concerns have been expressed.

Additionally, the TTC have been advised of this recommendation, given the transit service that is provided at this intersection, and no comment has been given to date.

The Ward Councillor is aware of the recommendations of this staff report.

## **CONTACT**

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## **SIGNATURE**

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Peter K. Hillier  
Acting Director

## **ATTACHMENTS**

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Attachment 1: Map – Safety Review - Bombay Avenue and Bideford Avenue/Avenue Road