TORONTO

STAFF REPORT
ACTION REQUIRED

Traffic Control Signals Study – Danforth Road at Magnolia Avenue

Date:	September 13, 2011
To:	Scarborough Community Council
From:	Director, Transportation Services, Scarborough District
Wards:	Ward 35 – Scarborough Southwest
Reference Number:	P:\2011\Cluster B\TRA\Scarborough\sc1200 D11-4445647 & D10-4093473 Danforth Rd Magnolia tcs

SUMMARY

The purpose of this report is to secure the authority for the installation of Traffic Control Signals on Danforth Road at Magnolia Avenue.

Traffic studies reveal that a pedestrian crossing protection in the form of traffic control signal is warranted.

RECOMMENDATIONS

Transportation Services recommends that:

1. City Council approve the installation of Traffic Control Signals on Danforth Road at Magnolia Avenue.

2. City Council pass or amend the appropriate by-law(s) accordingly.

Financial Impact

The financial cost of installing these new traffic control signals is approximately $175,000.00. The funding for these signals is currently not available in the Transportation Services Division's Capital Works Budget under Project No. CTP711-01. Installation will occur when funding and scheduling permit, taking competing priorities into consideration.

ISSUE BACKGROUND

Further to a request from Councillor Michelle Berardinetti, Transportation Services staff conducted traffic studies to determine whether traffic control signals should be installed at the subject intersection. Pedestrian Crossing Protection studies have been conducted on Danforth Road at Magnolia Avenue and Traffic Control Signals are warranted.

COMMENTS

The following characteristics describe the area around Danforth Road at Magnolia Avenue:

- Danforth Road is a four-lane major arterial road with a traffic volume of approximately 16,392 vehicles per day, having an operating speed of 66 km/h.
- Danforth Road has a posted speed limit of 60 km/h.
- Toronto Transit Commission bus stops for both the eastbound and westbound are located on Danforth Road at Magnolia Avenue.
- Traffic Control Signals are located approximately 254 metres to the east of the Magnolia Avenue at Midland Avenue and approximately 444 metres to the west at Norman Cook Public School.
- Sidewalks are located on both sides of Danforth Road.

Pedestrian Crossing Protection studies involves the incremental consideration of the warrants or technical justification for the following traffic control devices:

- Pedestrian Refuge Island (PRI)
- Pedestrian Crossover (PXO)
- Traffic Control Signals (TCS)

Pedestrian Refuge Island Warrant Study

The first level of pedestrian crossing protection considered is the installation of a Pedestrian Refuge Island requiring a detailed Pedestrian Crossing Study.

Pedestrian Crossing Volume Study
Study Date: Tuesday, May 10, 2011

Pedestrian Characteristics	Eight –Hour Pedestrian Crossing Volume: Danforth Road at Magnolia Avenue
	Total – Both Sides
Assisted Children*	2
Youths /Adults	107
Senior Citizens	3
Persons with Disabilities	3
Total Pedestrian Volume	115

* Assisted Children are children crossing the road accompanied by a youth, an adult or a senior citizen.

- Of the 115 pedestrians, 79 (69%) were generated by the TTC bus stops located in the vicinity of Danforth Road at Magnolia Avenue.

Pedestrian Refuge Island (PRI) Warrant Criteria

Pedestrian Refuge Island Warrant: Danforth Road at Magnolia Avenue	Requirement	Met/Not Met
Pedestrian Volume	> 100 pedestrians in 8 hours	115 - Met
Road Width	> 16.4 metres	14.6 m – Not Met
Number of Travel Lanes	5 lanes or less	Met

As outlined in the above table, two out of the three requirements are met on Danforth Road at Magnolia Avenue, justifying the installation of this type of Pedestrian Crossing Protection. However, a Pedestrian Refuge Island is not physically feasible at this location since the existing roadway is too narrow and a road widening is not feasible.

Pedestrian Crossover Warrant Study

The next level of crossing protection to consider is a Pedestrian Crossover (PXO).

PXO Warrant Criteria

Study Date: Tuesday, May 10, 2011

Pedestrian Crossover Warrant	Compliance Level
	Danforth Road at Magnolia Avenue
Pedestrian Volumes	48 %
Pedestrian Delays	48 %

- For a pedestrian crossover to be numerically justified, both the "Pedestrian Volume" and "Pedestrian Delays" warrants must be 100% satisfied.

As outlined in the above table, the pedestrian volumes and delays do not satisfy the technical requirements to install a pedestrian crossover at this intersection at this time on its own. However, a PXO would be warranted under engineering judgement as the next level of pedestrian crossing protection to be provided as a PRI is warranted but is not feasible to install.

Environmental Standards for PXO Suitability

Transportation services staff conducted a detailed review of this location and compared the standards at this PXO with the recommended design standards, or "environmental standards, for PXO's as developed by the Province of Ontario in consultation with Ontario municipalities. These criteria describe a roadway environment suitable for this type of control, and exposure factors which would make a PXO unsuitable or potentially unsafe.

The following table outlines our review of these PXO criteria and whether they are satisfied at this location, Danforth Road at Magnolia Avenue:

Standards or Criteria to be Met for Physical Suitability of a PXO	Met/ Not Met	Comment
Vehicle operating speed less than 60 km/h	Not Met	85th percentile is 62 km/h (EB), 85th percentile is 69 km/h (WB); Average 85th percentile is 66 km/h. (Posted speed limit is 60 km/h).
Not more than four lanes wide on a two-way street or more than three lanes wide on a one-way street.	Met	4 lanes 14.6 metres road width.
Traffic volume less than 35,000 vehicles per day (total both directions)	Met	16,392 vehicles per day.
No driveways or entrances nearby	Not Met	Low volume residential driveway and one commercial driveway
No significant volume of turning movements which interfere with PXO.	Met	Very Low Turning Movements Volume
No visibility problems exist for either pedestrians or motorists.	Met	Visibility is adequate
No loading zones (including TTC) in the immediate vicinity.	Not Met	TTC bus stops are located on both sides of Danforth Road
Not less than 215 metres to another PXO or traffic control device.	Met	254 metres east to TCS at Midland, 444 metres west to TCS at Norman Cook PS

As described above, this potential PXO location would fail to meet three of the above "Environmental Standards" and would not be feasible at this location.
Of particular importance is the operating speed in excess of 60 km/h.

Since a PXO installation is considered unsuitable or potentially unsafe, the next form of Pedestrian Crossing Protection being a Traffic Control Signal can be considered.

Traffic Control Signal Warrant Study

Transportation Services staff conducted a Traffic Control Signal Warrant Study at the intersection of Danforth Road and Magnolia Avenue on Tuesday, May 10, 2011, using traffic volumes recorded over the peak eight hours of a typical weekday and the following results were obtained:

Traffic Control Signal Warrant	Compliance Level
Minimum Vehicular Volume	13%
Delay To Cross Traffic	33 %
Collision Hazard	7 %

The installation of traffic control signals are not numerically justified using the Traffic Signal Warrant calculations. For traffic control signals to be numerically justified, one of the "Minimum Vehicular Volume" or "Delay to Cross Traffic" warrants must be 100% satisfied or any two of the three warrants must be at least 80% satisfied.

However, the Traffic Control Signals are justified under Engineering Judgement as they would provide the only feasible measure of pedestrian crossing protection that is warranted at this location.

Collision History

A review of the Toronto Police Service collision records for the three-year period from January 1, 2008 to December 31, 2010 is summarized below.

Three-Year Collision Information	Number of Reported Collisions			
	2008	2009	2010	Total
Collisions Potentially Preventable by the installation of Pedestrian Traffic Control Signals	1	0	0	1
Collisions Involving Pedestrians Crossing Danforth Road	0	0	0	0

- The above noted collision record is not indicative of a safety problem at the subject intersection.

In summary, pedestrian traffic control signals are warranted for the intersection of Danforth Road and Magnolia Avenue under Engineering Judgement.

CONTACT

Marko A. Oinonen, B.A.Sc., P.Eng.
Manager, Traffic Operations, Scarborough District
Tel: 416-396-7148
Fax: 416-396-5641
E-Mail: moinone@toronto.ca

SIGNATURE

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Peter J. Noehammer, P.Eng.
Director, Transportation Services, Scarborough District

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ATTACHMENTS

1. Location Plan (Traffic Control Signals Study – Danforth Road and Magnolia Avenue)