

Traffic Control Signal Review - Warden Avenue at Cass Avenue/Palmdale Drive. Turn Prohibitions - Warden Avenue and Cass Avenue, and Birchmount Road and Cass Avenue

Date: April 29, 2021

To: Scarborough Community Council

From: Acting Director, Traffic Management, Transportation Services

Wards: Ward 22, Scarborough-Agincourt

SUMMARY

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

Transportation Services is requesting approval to install traffic control signals at the intersection of Warden Avenue at Cass Avenue/Palmdale Drive. The traffic control signals will provide enhanced safety for all road users and is justified based on the assessment undertaken.

Transportation Services is also requesting approval to prohibit northbound left-turns and southbound right-turns at the intersection of Birchmount Road and Cass Avenue, southbound left-turns and northbound right-turns at the intersection of Warden Avenue and Cass Avenue from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., Monday to Friday at both intersections.

This staff report outlines the results of a review of a potential of neighbourhood infiltration transient traffic on Cass Avenue and mitigate the risk of the potential angle type of collisions and will provided a safer environment for all roadway users at these intersections.

RECOMMENDATIONS

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

1. City Council authorize the installation of traffic control signals at the intersection of Warden Avenue at Cass Avenue/Palmdale Drive.
2. City Council prohibit northbound left-turns at the intersection of Birchmount Road and Cass Avenue from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., Monday to Friday.
3. City Council prohibit southbound right-turns at the intersection of Birchmount Road and Cass Avenue from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., Monday to Friday.
4. City Council prohibit southbound left-turns at the intersection of Warden Avenue and Cass Avenue/Palmdale Drive from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., Monday to Friday.
5. City Council prohibit northbound right-turns at the intersection of Warden Avenue and Cass Avenue/Palmdale Drive from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., Monday to Friday.

FINANCIAL IMPACT

The estimated cost for installing traffic control signals at the intersection of Warden Avenue and Cass Avenue/Palmdale Drive is approximately is \$250,000.00. Installing the prohibited turn signs at Birchmount Road and Cass Avenue, and Warden Avenue and Cass Avenue is \$4,000.00. Funding is anticipated to be available within the Transportation Services 2021 Operating Budget.

DECISION HISTORY

This report addresses a new initiative.

COMMENTS

Transportation Services staff was requested by the former Ward Councillor and local residents, to investigate the feasibility of installing traffic control signals or a Pedestrian Crossover (PXO), at the intersection of Warden Avenue and Cass Avenue/Palmdale Drive, as well as conduct a Transient Traffic Study at Warden Avenue and Cass Avenue, and Birchmount Road and Cass Avenue.

Existing Conditions

The following characteristics describe Warden Avenue, Birchmount Road and Cass Avenue:

Warden Avenue is characterized by the following conditions:

- Warden Avenue is a five-lane, north-south major arterial roadway
- It operates two-way traffic on a pavement width of approximately 14.7 metres
- The daily two-way traffic volume on Warden Avenue is approximately 29,000 vehicles
- The regulatory speed limit is 50 km/h
- Warden Avenue is designated as a through highway, located north of Highway 401, south of Sheppard Avenue East, and west of Birchmount Road. The westbound and eastbound traffic on Cass Avenue and Palmdale Drive is required to stop respectively at Warden Avenue
- Sidewalks are located on both sides of Warden Avenue
- There is TTC service provided by the 68 Warden bus and there are northbound and southbound bus stops near the pedestrian refuge island (PRI)
- A PRI is located 22 metres south of Cass Avenue and Palmdale Drive

The land use in the surrounding area is a mix of single family residential dwellings and townhouse complexes

Adjacent traffic control signals are located on Warden Avenue approximately 330 metres to the south at Cloverleaf Gate and Arkona Drive, and approximately 320 metres to the north at Sheppard Avenue East

Cass Avenue is characterized by the following conditions:

- Cass Avenue is a two-lane east-west local roads
- It operates two-way traffic on a pavement width of approximately 8.5 metres
- The daily two-way traffic volume is approximately 1,800 vehicles
- There is traffic calming measures (speed humps) installed between Warden Ave and Birchmount Road
- The posted speed limit is posted at 30 km/h
- Heavy trucks are prohibited at all times
- There is no TTC service
- There are sidewalks located on both sides of the street
- Cass Avenue runs from Warden Avenue to Allanford Road (east of Birchmount Road). Lynngate Public School is located on the south side of Cass Avenue, between Markbank Avenue and Malamute Crescent
- Cass Avenue between Aragon Avenue and Amethyst Road is designated as a Community Safety Zone

The land use in the surrounding area is a mix of single family residential dwellings, townhouse complexes, school and a park.

Birchmount Road is characterized by the following conditions:

- Birchmount Road is a five-lane, north-south major arterial road
- It operates two-way traffic on a pavement width of approximately 14.7 metres
- The daily two-way traffic volume on Birchmount Road is approximately 24,000 vehicles
- The regulatory speed limit is 50 km/h
- Sidewalks are located on all sides of Birchmount Road and Cass Avenue intersection
- There is TTC service provided by the 17 Birchmount bus, and there are northbound and southbound bus stops at the intersection

The land use in the surrounding area is a mix of single family residential dwellings, townhouse complexes and commercial plaza

Adjacent traffic control signals are located on Birchmount Road approximately 560 metres to the south at Scarden Avenue and Allanford Road and approximately 230 metres to the north at Sheppard Avenue East

A map of the area is shown in Attachment 1.

Transportation Services has reviewed the need for either a Pedestrian Crossover (PXO) or traffic control signals at this location to determine if either device should be recommended as an appropriate pedestrian crossing protection measure.

Pedestrian Crossover (PXO)

To determine the need for a PXO at Warden Avenue and Cass Avenue/Palmdale Drive, staff rely on the justification criteria as outlined in the Ontario Traffic Manual (OTM) Book 15. The OTM justification criteria includes two main factors: the volume of vehicles and pedestrians, and pedestrian delay to cross traffic. Based on the traffic volume on Warden Avenue, the warrants require a minimum of 200 pedestrians crossing over eight hours. Also, based on the pedestrian crossing volume, at least 130 pedestrians must be delayed more than 10 seconds.

An eight-hour pedestrian volume and delay study was conducted on Thursday, April 4, 2019, which recorded the total volume and delays of pedestrians crossing at Warden Avenue and Cass Avenue/Palmdale Drive. Seniors, unassisted children and people with disabilities that are observed crossing are given a higher weighting by a factor of two. The adjusted volume of pedestrians observed crossing was 206; of these, 132 experienced a delay greater than 10 seconds. The compliance level of the study results in relation to the warrant criteria is shown in Table 1 below.

Table 1: Pedestrian Crossover Warrant Criteria and Compliance at Warden and Cass Avenue/Palmdale Drive.

Criteria	Compliance
Pedestrian Volume	100 percent
Pedestrian Delay	100 percent

In order to meet the warrant criteria, 100 percent compliance is required in both categories. Based on the results of the study, a PXO is not technically justified as the compliance levels did not meet the minimum requirements.

In addition to the technical criteria, consideration is given to the surrounding area and the collision history and in some cases engineering judgement may be applied to recommend a PXO even if the number of pedestrians does not meet the threshold of the technical warrants.

Staff's review of the collision history and surrounding area did not disclose any other environmental factors that would warrant a PXO at this location. Collision statistics provided by the Toronto Police Service for the three-year period ending December 31, 2019 disclosed no collisions at the area of Warden Avenue and Cass/Palmdale Drive that involved crossing pedestrians.

Environmental safety characteristics were also evaluated to ensure that the installation of a pedestrian crossover would be appropriate at this location. Details of the evaluation are included in Attachment 1. Based on the evaluation, a pedestrian crossover would not be a suitable type of pedestrian crossing protection at this location on basis on a large crossing road width, spacing to traffic controls and road classification on Warden Avenue. Therefore, traffic control signals are recommended at this location rather than a pedestrian crossover.

Traffic Control Signals

To determine the need for traffic control signals at the intersection of Warden Avenue and Cass Avenue/Palmdale Drive, staff rely on the justification criteria as outlined in the Ontario Traffic Manual (OTM) Book 12. The OTM justification criteria includes factors such as volume of vehicles and pedestrians, delay to cross traffic, and collision history. In addition to these technical justifications, staff consider an environmental checklist which includes consideration of road width, posted speed limit, operating speeds, adjacent land uses, pedestrian desire lines and demographics, presence of a transit stop, sight lines, and distance between existing crossing opportunities.

As part of the investigation, staff conducted vehicle and pedestrian counts on Thursday, April 4, 2019 at the subject Warden Avenue and Cass Avenue/Palmdale Drive. The results of the counts and collision hazard are summarized in Table 1. The "Collision hazard" criterion is based on the number of collisions potentially preventable by the installation of traffic control signals. Collision history provided by the Toronto Police Service for the three-year period ending December 31, 2019 disclosed two collision(s) making a left-turn and a right-turn at the subject intersection that were potentially preventable by the installation of traffic control signals.

Table 2: Warrant Compliance - Warden Avenue and Cass Avenue/Palmdale Drive

Justification	Compliance level
Minimum vehicular volume	69%
Delay to cross traffic (pedestrians and vehicles)	47%
Collision hazard	27%

To meet the justification criteria for the installation of traffic control signals, one of the justifications must be 100 percent satisfied or any two of the three justifications must be at least 80 percent satisfied. Based on the results in Table 1, the installation of traffic control signals is justified.

In regards to the environmental checklist, staff noted the following environmental factors:

- the long spacing between pedestrian crossing protection on Warden Avenue;
- the presence of transit stops in both directions on Warden that attract pedestrians to cross the street;
- the pedestrian generators in the immediate area, including residential homes and transit stops that attract vulnerable pedestrians to cross the street; and
- the four lane cross-section on Warden Avenue.

In considering the above environmental factors, Transportation Services recommends the installation of traffic control signals at Warden Avenue and Cass Avenue/Palmdale Drive as it will provide enhanced safety for all road users.

Other Considerations

It should also be noted that the installation of traffic control signals at Warden Avenue and Cass Avenue/Palmdale Drive will result in a loss of approximately 5 parking spaces on Cass Avenue and five parking spaces on Palmdale Drive associated with the installation of traffic control signals at this intersection, and there will be no impact to transit service on Warden Avenue.

Prohibited Turns Petition

Location	No Response	Support	Total # of Residents
Turning into Cass Ave from Warden Ave and Birchmount Rd	19	20 (51%)	39

Study Results

To identify existing conditions for vehicles entering and existing Cass Avenue, staff has conducted an Origin and Destination traffic study during the morning and afternoon peak periods.

1. Warden Avenue and Cass Avenue - Origin and Destination Study

Study Date: Wednesday, October 31, 2018

Time Period	Warden Avenue at Cass Avenue [Inbound]	Birchmount Road at Cass Avenue [Total Outbound-Right-Turn]	Eastbound Right-Turns [Trackable]	Birchmount Road at Cass Avenue [Total Outbound-Left-Turn]	Eastbound Left-Turns [Trackable]
7:30-9:30 A.M.	76	62	17 (27%)	12	4 (33%)
11:00-1:00 P.M.	77	28	8 (28%)	16	4 (25%)
4:00-6:00 P.M.	275	72	21 (29%)	63	17 (27%)

2. Birchmount Road and Cass Avenue - Origin and Destination Study

Study Date: Wednesday, October 31, 2018

Time Period	Birchmount Rd at Cass Ave [Inbound]	Warden Ave at Cass Ave [Total Outbound-Right-Turn]	Westbound Right-Turns [Trackable]	Warden Ave at Cass Ave [Total Outbound-Left-Turn]	Westbound Left-Turns [Trackable]
7:30-9:30 A.M	119	92	21 (23%)	59	14 (24%)
11:00-1:00 P.M.	82	32	10 (31%)	58	16 (27%)
4:00-6:00 P.M.	104	63	18 (29%)	33	9 (27%)

Proposed Turn Prohibitions

The study recorded the number of motorists whose primary route of travel was southbound left-turn on Warden Avenue into Cass Avenue and continue east on Cass Avenue then exits on to Birchmount Road.

A petition was received from the Ward Councillor offices, showing 51% supported for the subject proposal for this turn restrictions from 7:00 a.m. to 9:00 a.m., and from 4:00 p.m. to 6:00 p.m., Monday to Friday.

The proposed turn prohibitions at these two subject intersections are to reduce a potential of neighbourhood infiltration transient traffic into the community of Tam O'shanter Sullivan neighbourhood on Cass Avenue during the morning and afternoon periods, Monday to Friday and would directly impact the residents living in this community.

During these times, any motorists observed disobeying these regulations would be subject to a turning movement violation and subject to potentially significant penalties by police enforcement.

The Ward Councillor has been advised of the recommendations of this staff report.

CONTACT

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SIGNATURE

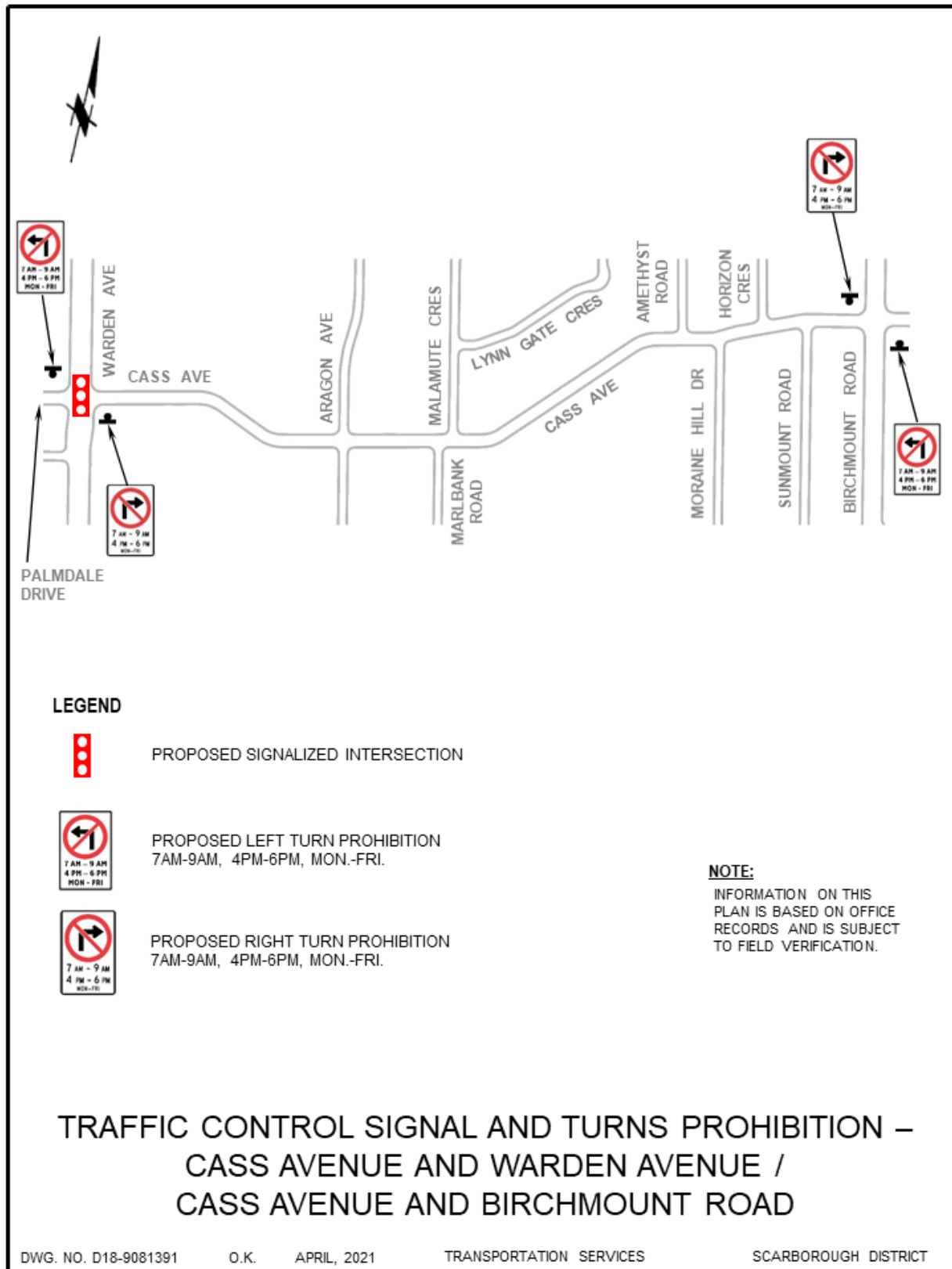
Roger Browne, M.A.Sc., P. Eng.
Acting Director, Traffic Management, Transportation Services

ATTACHMENTS

Attachment 1: Map - Traffic Control Signal and Turns Prohibition - Cass Avenue and Warden Avenue/Cass Avenue and Birchmount Road

Attachment 2: Environmental Safety Audit - PXO – Warden Avenue and Cass Avenue/Palmdale Drive

Attachment 1: Map - Traffic Control Signal and Turns Prohibition - Cass Avenue and Warden Avenue/Cass Avenue and Birchmount Road



Traffic Control Signal Review - Warden Avenue at Cass Avenue/Palmdale Drive.
Turn Prohibitions - Warden Avenue and Cass Avenue, and Birchmount Road and Cass Avenue

Attachment 2: Environmental Safety Audit - PXO – Warden Avenue and Cass Avenue/Palmdale Drive

Standard	Comments	Standard Met/Not Met
Vehicle operating speed less than 60 km/h	The posted speed limit on Warden Avenue is 50 km/h.	Met
Not more than four lanes wide on a two-way street or more than three lanes wide on a one-way street	Warden Avenue operates two-way north-south traffic with four lanes of travel	Met
Traffic volume not more than 35,000 vehicles per day	The daily traffic volume is approximately 29,000 vehicles per day	Met
No significant volume of turning movements	The volume of traffic turning to/from Warden Avenue is moderate (approx. 1,814 vehicles over busiest eight hours)	Not Met
No visibility problems exist for either pedestrians or motorists	No vertical or horizontal curves.	Met
No loading zones (including TTC) in the immediate area	Yes, TTC services provided at this location	Met
No driveways or entrances nearby	Driveway to townhome complex 125 Palmdale Drive, is located approximately 21 metres west of Warden Avenue	Met
Spacing is not less than 200 metres to another pedestrian crossover or traffic control signal	TCS approximately 330 metres to the south at Cloverleaf Gate/Arkona Drive TCS approximately 320 metres to the north at Sheppard Avenue East	Not Met