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TRAFFIC CONTROL SIGNAL
HIGHWAY 27 AND THE BOULEVARD
CITY OF VAUGHAN

The Transportation Services Committee recommends the adoption of the recommendations contained in the following report dated February 9, 2012, from the Commissioner of Transportation and Community Planning.

1. RECOMMENDATIONS

It is recommended that:

1. Traffic control signals not be installed at this time at the intersection of Highway 27 (Y.R. 27) and The Boulevard, in the City of Vaughan.
2. The Regional Clerk forward this report to the Clerk of the City of Vaughan.

2. PURPOSE

The purpose of this report is to investigate the feasibility of installing traffic control signals at the intersection of Highway 27 at The Boulevard, in the City of Vaughan.

3. BACKGROUND

On September 7, 2011, Transportation Service Committee requested staff to investigate the installation of traffic control signals at Highway 27 and The Boulevard

At the Transportation Service Committee meeting on September 7, 2011, the Committee requested staff to provide a report on the feasibility of installing traffic control signals at the intersection of Highway 27 and The Boulevard.

On October 17, 2002, Council adopted the Traffic Control Signal Warrant policy for the installation of traffic signals on the Regional road network

York Region's policy for the installation of a traffic control signal is based on a series of guidelines established by the Ministry of Transportation and those approved by Regional Council on October 17, 2002. The traffic control signal warrant analysis considers traffic volumes on the major and minor roads for the highest eight hours of a weekday, peak

hour delays for minor road traffic, pedestrian volumes and a three-year collision history. The traffic control signal warrant analysis is summarized in Table 1.

Table 1
Traffic Control Signal Warrant Analysis

Warrant Component	Threshold
1. Total Volume	100%
2. Total Minor Road Volume	100%
Combination 1 + 2	80%
*Municipal Warrant 1 and 2	70%
Left Turn & Right Angle Collision Frequency	15
*Peak Hour Delay	4 hrs
* York Region's traffic signal warrant consists of additional warrant components to increase the opportunity for an intersection to warrant the installation of a traffic signal.	

The Ministry of Transportation guidelines indicate that an intersection meets the warrant conditions for traffic control signals when two of the warrant components are at or above 80% compliant, or one component is 100% compliant. The first warrant criterion accounts for the total amount of traffic using an intersection and the second warrant criterion accounts for the delay to side road traffic. The Region's current Traffic Control Signal Warrant policy is outlined in *Attachment 1*.

The Region's Traffic Control Signal Warrant Policy also stipulates that a local municipality can pay for the installation of unwarranted traffic control signals provided Warrant 1 and Warrant 2 are satisfied by at least 70%, and all installation and ongoing maintenance costs are incurred by the local municipality until traffic control signals become warranted.

4. ANALYSIS AND OPTIONS

Highway 27 and The Boulevard does not satisfy the Region's traffic control signal policy at this time

The intersection of Highway 27 and The Boulevard is a t-type intersection with stop-controlled on The Boulevard. Highway 27 in this vicinity is a four lane urban roadway with a two-way left-turn centre lane and a posted speed limit of 80 kilometres per hour. This road section carries approximately 13,000 vehicles daily and accommodates very few pedestrians daily. In addition, no collisions occurred in the previous three years that are preventable with the installation of a traffic control signal or resulted in a fatal collision. A location plan of the intersection is outlined in *Attachment 2*.

On October 4, 2011, Regional staff conducted an eight-hour traffic turning movement count at Highway 27 and The Boulevard. A total of five pedestrians were counted during

the highest eight hours of a weekday. The intersection count was used to conduct a traffic control signal warrant analysis according to the Region's policy.

Table 2 summarizes the results of the traffic control signal warrant analysis for Highway 27 and The Boulevard.

Table 2
Highway 27 and The Boulevard Traffic Control Signal Warrant Analysis

Warrant Component	Warranted	Compliance	Threshold
1. Total Volume	No	55%	100%
2. Total Minor Road Volume	No	87%	100%
Combination 1 + 2	No	55%	80%
*Municipal Warrant 1 & 2	No	55%	70%
Left Turn & Right Angle Collision Frequency	No	0	15
*Peak Hour Delay	No	0.67 hrs	4 hrs
* York Region's traffic signal warrant consists of additional warrant components to increase the opportunity for an intersection to warrant the installation of a traffic signal.			

Traffic control signals are warranted when two of the warrant components are at or above 80% compliant, or one component is 100% compliant or if fifteen or more collisions, which can be prevented by traffic controls signals, occurred over a three-year period. None of these warrant criteria are satisfied at the intersection of Highway 27 and The Boulevard.

Installing traffic control signals at a location that does not meet the traffic control signal warrant can result in a reduction in overall intersection safety and increased traffic delay. Specifically, the installation of traffic control signals increases the occurrence of certain types of collisions. Rear-end collisions on the major streets; for example, can increase by as much as 60% after the installation of traffic control signals. Additionally, the average delay to side street traffic is often substantially increased during periods of the day outside of peak hours – a likely outcome in this instance.

Motorists currently experience 22 seconds of delay turning left from The Boulevard onto Highway 27

Regional staff conducted a westbound left-turn delay study on October 20, 2011 between 7:15 am to 8:15 am. The study identified a maximum of three vehicles queued and an average delay of 22 seconds per vehicles. At signalized intersections, left turning motorists on the minor street experience 65 to 80 seconds of delay. There are currently sufficient gaps in traffic on Highway 27 to accommodate left turning motorist with minimal delay on The Boulevard. Installing traffic control signals at this intersection will increase delay for all users of this intersection.

This increased delay can result in driver frustration and non-compliance with the traffic control signal indications. To avoid these safety concerns, York Region's policy is to install traffic control signals only if the warrant criteria are met. In accordance with York Region's current policy, this intersection does not satisfy the traffic control signal warrants, therefore, traffic control signals is not recommended at this time.

5. FINANCIAL IMPLICATIONS

The cost in reviewing the feasibility of installing traffic control signals at Highway 27 and The Boulevard was included in the 2011 Transportation Services budget.

6. LOCAL MUNICIPAL IMPACT

This report is in response to Transportation Service Committee requesting staff to provide a report on the feasibility of installing a traffic control signals at the intersection of Highway 27 and The Boulevard, in the City of Vaughan. This intersection does not satisfy the Region's traffic control signal policy at this time. Regional staff will continue to monitor this intersection for changes in traffic patterns and pedestrian movement.

7. CONCLUSION

This report is in response to the Transportation Services Committee requesting staff to report on the feasibility of traffic control signals at the intersection of Highway 27 and The Boulevard, in the City of Vaughan. This intersection does not satisfy the Region's traffic control signal policy: therefore, staff recommends that traffic control signals not be installed at this time.

For more information on this report, please contact Steven Kemp, Director, Traffic Management and Intelligent Transportation Systems at Ext. 5226.

The Senior Management Group has reviewed this report.

(The two attachments referred to in this clause are attached to this report.)



STATUS

Council Approved Y N

CAO Approved: Y N

TITLE: Traffic Signal Warrants	NO.: Effective Date: Latest Revision Date: September 2002
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POLICY STATEMENT:

The Traffic Signal Warrant policy is a policy providing a warrant process for the installation of traffic signals at locations along The Regional Municipality of York road network.

APPLICATION:

The Traffic Signal Warrant policy will be used by all Regional Employees, in particular Transportation and Works Employees who are involved in determining the locations for the installation of traffic signals along the Regional road network.

PURPOSE:

This policy is meant to provide a credible, technically sound and consistent method of determining warranted locations for the installation of traffic signals on Regional roads.

DESCRIPTION:

Traffic signals alternate the right-of-way between conflicting streams of vehicular traffic, or vehicular traffic and pedestrians crossing a roadway, with maximum efficiency and safety. Maximum efficiency implies the minimum delay to traffic. Safety requires that the traffic signals operate at the minimum hazard to vehicles and pedestrians.

The following warrants are to be used to determine whether or not traffic signals are justified at a location.

1. Traffic Control Signal Warrants as Outlined in Book 12 of the Ontario Traffic Manual

These warrants are currently used within The Regional Municipality of York. They are comprised of the following:

Traffic Signal Warrants

Warrant 1 – Minimum Vehicle Volumes

Warrant 2 - Delay To Cross Traffic

Warrant 3 – Collision Experience

If any one warrant is satisfied by 100% or if any two warrants are satisfied by 80% or more, the installation of traffic signals is considered to be justified.

2. **Safety Warrant**

The safety warrant is an analysis based upon the safety performance of an intersection, compared to other intersections with similar characteristics. These characteristics are summarized into safety performance functions (SPFs). In simple terms, the existing safety performance of an unsignalized intersection can be determined and then compared to a projected safety performance, if traffic signals were installed.

If the rate of equivalent collisions is substantially lower with the installation traffic control signals than as an unsignalized intersection, then the installation of traffic control signals is considered to be justified.

3. **“T” Type Intersections Warrant**

The threshold volumes for side street traffic shall not be increased by 50% when evaluating "T" type intersections because the side street traffic still faces the same traffic flows on the major street.

4. **Peak Hour Delay For Entering onto the Major Street from the Side Street**

A Peak Hour Delay warrant is met when:

- The total delay experienced by the traffic on one minor-street approach (one direction only) controlled by a stop sign equals or exceeds four vehicle-hours for a one lane approach and five vehicle-hours for a two lane approach; and
- The volume on the same minor street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes; and
- The total entering volume during the hour equals or exceeds 800 vehicles per hour for intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches.

5. **Installation of Unwarranted Traffic Signals Paid by Local Municipalities**

Traffic Signal Warrants

Area municipalities shall be permitted to pay for the installation of unwarranted traffic signals subject to a number of conditions being met.

- The Transportation and Works Department have no technical objections to the installation of traffic signals at the location requested.
- Warrant 1 and Warrant 2 are satisfied by at least 70%.
- All installation costs are incurred by the local municipality. Installation costs are estimated at \$120,000 per location, permanent installation, \$60,000, temporary installation.
- All on-going maintenance costs are incurred by the local municipality, until such time as the traffic signals become warranted. On-going maintenance costs are estimated at \$4,000 per location/annually. Actual costs will be charged to the municipality.
- When the traffic signal becomes warranted, the Region will reimburse the local municipalities 100% of the original installation cost of permanent signals. Temporary installation will be done in areas where road improvements are planned within five years. For temporary installation, the Region will reimburse the local municipality, the value of the material that is recoverable.

RESPONSIBILITIES:

Transportation and Works Department:

- The Transportation and Works Department shall assess the need for the installation of traffic signals on the Regional Road system.

Area Municipalities:

- The Area Municipalities, in consultation with Regional staff, shall aid in the assessment of the need to install traffic signals.

CONTACT:

Contact, Director of Roads Transportation, Transportation and Works Department

<u>APPROVAL INFORMATION</u>

Traffic Signal Warrants

CAO Approval Date:

Committee:

Clause:

Report No:

Council Approval:

Minute No.

Page:

Date:



LOCATION PLAN

Highway 27 (YR 27) and The Boulevard
 City of Vaughan



Highway 27 and The Boulevard



0 62.5 125 250 375 500 Meters

TRANSPORTATION SERVICES