



TO: GENERAL COMMITTEE

SUBJECT: ALL-WAY STOP CARDINAL STREET AND HADDEN CRESCENT (EASTERLY INTERSECTION)

WARD: 3

PREPARED BY AND KEY CONTACT: A. PURCELL, SENIOR TRANSPORTATION OPERATIONS TECHNOLOGIST

SUBMITTED BY: M. BANFIELD, RPP, DIRECTOR OF DEVELOPMENT SERVICES

GENERAL MANAGER APPROVAL: B. ARANIYASUNDARAN, P. ENG., PMP, GENERAL MANAGER OF INFRASTRUCTURE AND GROWTH MANAGEMENT

CHIEF ADMINISTRATIVE OFFICER APPROVAL: M. PROWSE, CHIEF ADMINISTRATIVE OFFICER

RECOMMENDED MOTION

1. That Traffic By-law 2020-107, Schedule '19', "Providing for The Erection of Stop Signs at Intersections" be amended by adding the following:

<u>"Cardinal Street and Hadden Crescent (Easterly Intersection)</u>	Eastbound and Westbound on Cardinal Street and Northbound on Hadden Crescent"
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PURPOSE & BACKGROUND

Report Overview

2. Staff in Development Services Department have received a request from the Ward Councillor to investigate the feasibility of implementing an All-Way Stop at the easterly intersection of Cardinal Street and Hadden Crescent.
3. The existing traffic operations at Cardinal Street and Hadden Crescent require vehicles travelling north on Hadden Crescent to stop at Cardinal Street. Currently there are sidewalks along the west side of Hadden Crescent and the north side of Cardinal Street. Both roadways are classified as local residential roads. Please refer to Appendix "A" for a map of the study area.
4. Staff have recently installed "No Parking Anytime" corner restrictions at Cardinal Street and Hadden Crescent to improve operational concerns due to vehicles parking within the intersection. Please refer to Appendix "A" for current parking restrictions.

ANALYSIS

5. Staff have investigated the intersection of Cardinal Street and Hadden Crescent (easterly intersection) to determine if an All-Way Stop is warranted based on criteria within the Ontario Traffic Manual (OTM) Book 5 – Regulatory Signs.

The OTM warrant is based on volume, collision history, and stopping sight distance at the intersection. There are two classes of warrants identified in the OTM. Each class is based on the

classifications of roadways; Minor Roadways (Locals) and Major Roadways (Collectors and Arterials). Road Classification is determined using the City of Barrie Official Plan, 2023, Map 4b Mobility Network.

6. Based on the classification of Cardinal Street and Hadden Crescent both being local residential roads, the local roads warrant was used. Each component of the All-Way Stop Warrant can satisfy the warrant independently.
 - a) **Volume** - The total vehicle volume on all approaches greater than 200 vehicles per hour for each of the highest 4 hours of the day. On the minor street (Hadden Crescent) it must exceed 75 units per hour for each of the 4 peak hours. The volume split must not exceed 75%/25%.
 - b) **Collision History** – Reviews high collision frequency. There must be 3 collisions per year over a three-year period. Only collisions that are correctable through All-Way Stop control (i.e., right angle and turning type collisions) and reported to the Barrie Police Service are considered for the review.
 - c) **Stopping Sight Distance** - The distance required for a driver to see ahead to stop if necessary. It must not be less than 85 metres.

7. The results of the All-Way Stop analysis into the easterly intersection of Cardinal Street and Hadden Crescent are summarized below.

Description	All-Way Warrant	Recorded Data	Satisfied All-Way Warrant	
			Yes	No
Part 1a – Total Volume Total vehicle volume on all approaches	Greater than 200 vehicles per hour for each of the highest 4 hours of the day.	60 Vehicles (7:00-8:00) 69 Vehicles (8:00-9:00) 92 Vehicles (15:00-16:00) 95 Vehicles (16:00-17:00)		
Part 1b – Minor Street Volume Combined vehicle and pedestrian volume on (Minor Street)	75 units per hour wishing to enter the intersection for each of the same 4 hours as the total volume	14 Units (7:00-8:00) 15 Units (8:00-9:00) 10 Units (15:00-16:00) 16 Units (16:00-17:00)		
Part 1c – Volume Split Volume of Traffic on (Minor Street) (Minor Street must not be less than 30% of the total volume entering the intersection)	Volume split does not exceed 70%/30% at the intersection (Minor Street must not be less than 30% of the total volume entering the intersection). Measured over the entire 4 hours. Volume on Major Street is vehicles only. Volume on Minor Street is vehicles and pedestrians. 75%/25% for three-legged intersections.	83%/17% Volume Split		X
Part 2 – Collision Intersection Collision Frequency	3 collisions per year over 3 years (*example* 9 collisions in 36 months)	0 reported collisions over a 3-year period		X
Part 3 – Visibility Stopping Sight Distance from (Minor Street)	Less than 85m	57 metres	X	

8. Staff have identified through the turning movement count that the peak 4 hours of the day were (7:00am – 8:00am), (8:00am – 9:00pm), (3:00pm – 4:00pm) and (4:00pm – 5:00pm). During these peak times, Cardinal Street and Hadden Crescent do not meet the 200 vehicles per hour requirement. Cardinal Street and Hadden Crescent has a volume split of 83%/17% (83% on Cardinal Street and 17% on Hadden Crescent). This volume split does not meet the warrant criteria for three-legged intersections of 75% on the major street, and 25% on the minor street.
9. Staff completed a site investigation to analyse the sight distance for vehicles stopped on Hadden Crescent. The minimum sight distance based on the Transportation Association of Canada Geometric Design Guide for Canadian Roads requires a minimum sight distance of 85 metres. Minimum sight distance is based on the operating speed of the roadway. Due to the horizontal alignment of Cardinal Street and vehicles parking in driveways, only 57 metres of sight distance is achieved.
10. Staff implemented “No Parking Anytime” restrictions on the northeast corner of the intersection to try and achieve the minimum sight distance from Hadden Crescent. While these parking restrictions increased the safety of the intersection, they did not provide enough sight distance to achieve the minimum 85 metres that is required. The geometrics of the roadway combined with vehicles parking in driveways are the main attributors to the reduced sight lines at this location. Both factors are not correctable to achieve the minimum stopping sight distance.
11. Based on the sight distance not being correctable, the intersection satisfies the All-Way Stop warrant criteria of Part 3 - Visibility.
12. Staff prepared a questionnaire that was mailed to 30 property owners on Cardinal Street and Hadden Crescent to seek input on the proposed All-Way Stop. Staff received six (6) responses and the results of the questionnaire are below:

ALL-WAY STOP AT CARDINAL STREET AND HADDEN CRESCENT SURVEY	RESPONSES RECEIVED IN FAVOUR	PERCENTAGE OF RESPONSES
Option “A” – An All-Way Stop be Implemented.	3	50%
Option “B” – No change be made (stop remains on Hadden Crescent only)	3	50%
TOTAL (Out of 30)	6	20%

13. A review of the questionnaire responses identified a total participation of 20%. From the responses, three (3) are in favour of implementing an All-Way Stop and three (3) opposed. Residents expressed concerns that the implementation of an All-Way Stop is unnecessary.
14. Based on the required 85 metres of sight lines not being achieved or correctable at the intersection of Cardinal Street and Hadden Crescent, the Local Road All-Way Stop Warrant is satisfied. As a result, staff recommend that the following amendments are made to the Traffic By-Law:

“Cardinal Street and Hadden Crescent (Easterly Intersection) Eastbound and Westbound on Cardinal Street and Northbound on Hadden Crescent”

ENVIRONMENTAL AND CLIMATE CHANGE IMPACT MATTERS

15. There are no environmental and/or climate change impact matters related to the recommendation.

ALTERNATIVES

16. The following alternative is available for consideration by General Committee:

Alternative #1 General Committee could not install an All-Way Stop at the easterly intersection of Cardinal Street and Hadden Crescent. (i.e. Status Quo)

This alternative is not recommended as the intersection warrants an All-Way Stop based on the stopping sight distance restriction.

FINANCIAL

17. The costs associated with the installation of new signage for an All-Way Stop are approximately \$500 and can be accommodated within the 2024 Operating Budget.

LINKAGE TO 2022-2026 STRATEGIC PLAN

18. The recommendation(s) included in this Staff Report support the following goals identified in the 2022-2026 Strategic Plan:

Community Safety

19. The recommendation to install an All-Way Stop at the easterly intersection of Cardinal Street and Hadden Crescent will improve safety and traffic operations for pedestrians and motorists.

APPENDIX "A"

Cardinal Street and Hadden Crescent All-Way Stop Map (East Intersection)



	All-Way Stop Investigation	Ward: 3	
	Cardinal Street and Hadden Crescent	Design: AP	
	 Existing Stop Sign  Study Area  Existing No Parking Anytime	Date: November 2023	