



March 14, 2018

Lambton Kent District School Board
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Relocation of Students from John N. Given Public School to Tecumseh Public School
287 McNaughton Avenue West, Municipality of Chatham-Kent
Review of Changes to Pedestrian Travel Patterns

Dear Mr. Pelletier:

Dillon Consulting Limited has been retained to review the proposed relocation of students from John N. Given Public School to Tecumseh Public School from the perspective of potential impacts to pedestrian infrastructure requirements. This letter outlines the analysis methodology and study findings.

1.0 Background

1.1 Planned School Restructuring

John N. Given Public School is a public elementary school located at 92 Churchill Street in the community of Chatham. It has an enrolment of approximately 250 students. The school is planned to be permanently closed after the end of the 2017–18 school year. Students that would attend this school in 2018–19 will be relocated to Tecumseh Public School, which is located at 287 McNaughton Avenue West, approximately 650 metres north of John N. Given Public School. Tecumseh Public School has a current enrolment of approximately 350 students.

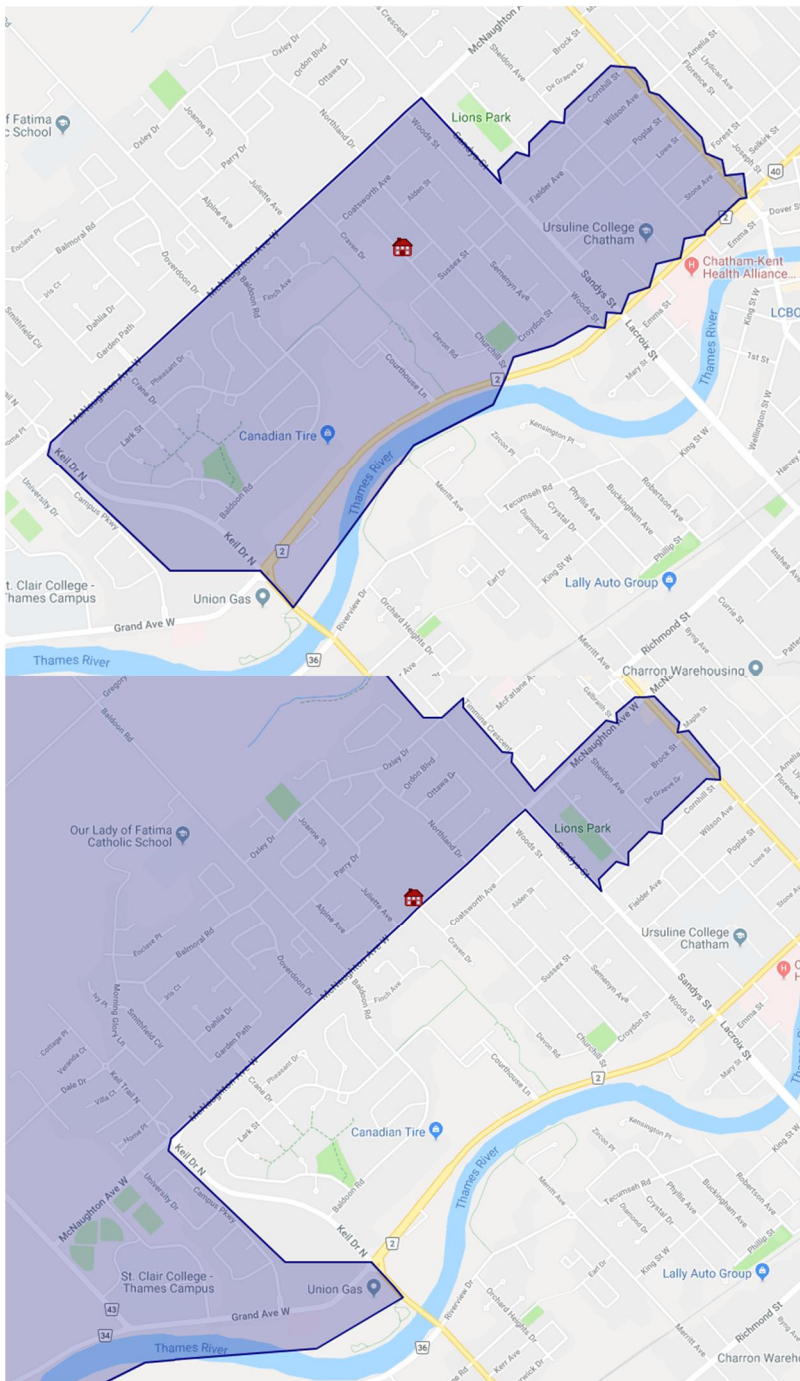
McNaughton Avenue generally forms the current boundary between the catchment areas for the two schools. Students living south of McNaughton Avenue currently attend John N. Given Public School, while students living north of McNaughton Avenue attend Tecumseh Public School. The current school attendance boundaries are illustrated in *Figure 1*.

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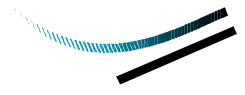


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Figure 1: Existing School Attendance Boundaries



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Once John N. Given Public School is closed, students living south of McNaughton Avenue will be relocated to Tecumseh Public School, and those students that walk to school will need to cross McNaughton Avenue when traveling to and from school.

1.2 Scope of Assessment

There is an existing midblock pedestrian signal on McNaughton Avenue West located west of Craven Drive (at the west end of the Tecumseh Public School property). The assessment documented in this report reviewed whether this signal is warranted based on current traffic and pedestrian activity; whether it would be warranted following the planned school reorganization, or whether a different form of pedestrian crossing control would be more appropriate; and whether the crossing is in the most appropriate location. The assessment also reviewed the surrounding street network to determine whether changes in walking patterns would result in sidewalks being warranted on streets where sidewalks do not currently exist.

2.0 Existing Conditions

2.1 Existing Roadway and Pedestrian Infrastructure

The study area consists of McNaughton Avenue between Keil Drive and Sandys Street, as well as the local street network in the area generally bounded by McNaughton Avenue, Keil Drive North, Grand Avenue, and St. Clair Street. This broader area is the area where transferring students live, and where students are ineligible for school busing (i.e., they would walk to school or would be dropped off).

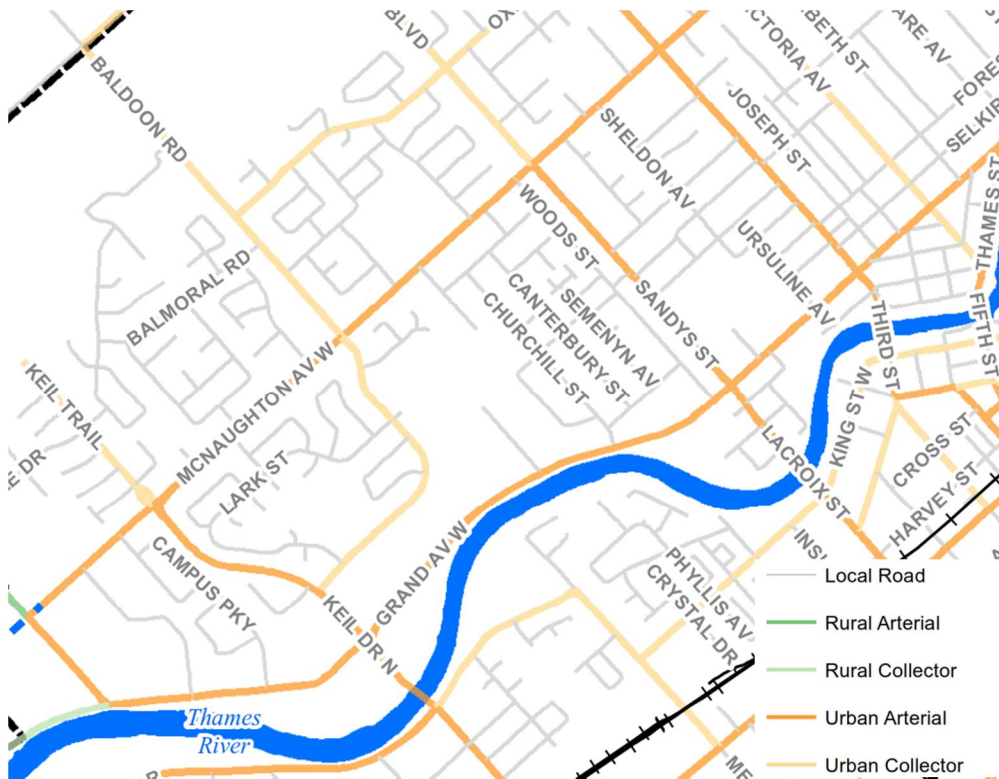
McNaughton Avenue is a two-lane urban arterial roadway that extends east-west through the study area (between Keil Drive North and Sandys Street). There is a curb-to-curb width of approximately 9.5 metres. Parking is prohibited on both sides of the road in the vicinity of Tecumseh Public School.

Figure 2 is an excerpt from the Municipality's Official Plan, illustrating the existing road classification in the broader study area south of McNaughton Avenue (the current catchment area for John N. Given Public School). In the area north of Grand Avenue, east of Keil Drive North and west of St. Clair Street, most streets are classified as local streets. The following street sections are classified as arterial or collector roads:

- Baldoon Road: collector road
- Sandys Street: arterial road south of McNaughton Avenue / collector road north of McNaughton Avenue

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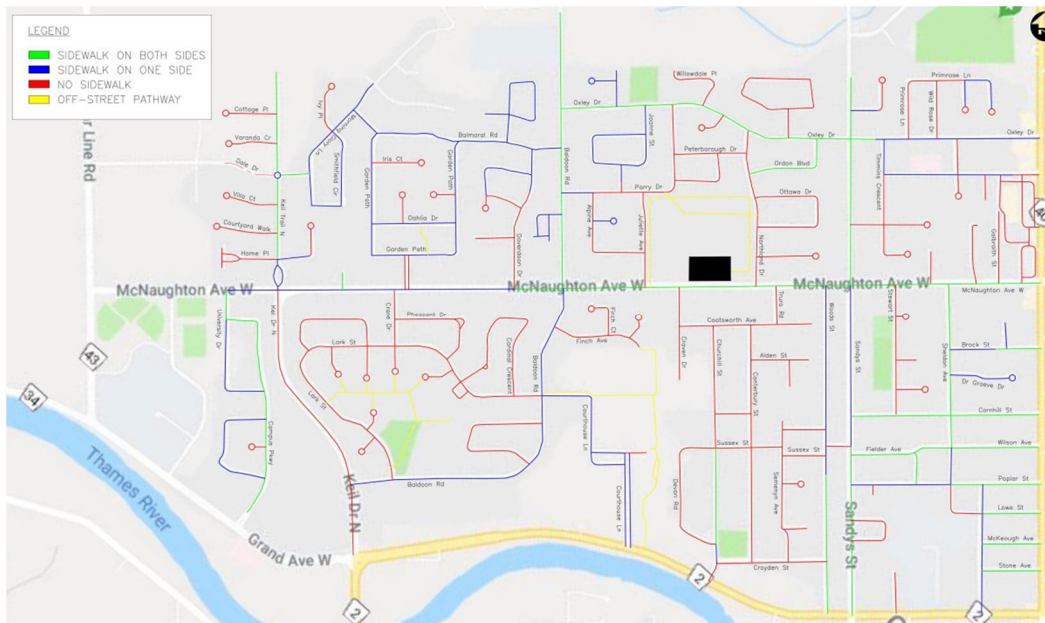
Figure 2: Existing Roadway Classification



There is no posted speed limit on McNaughton Avenue or on other streets within the broader study area, and therefore a statutory speed limit of 50 km/h applies under the *Highway Traffic Act*.

McNaughton Avenue has a sidewalk on the south side of the street throughout the study area, and also has a sidewalk on the north side of the street extending from Doverdoon Drive, past Tecumseh Public School, to the east end of the study area. Many local streets within the broader study area do not have a sidewalk on either side of the street. *Figure 3* identifies the street sections that have a sidewalk on both sides of the street, sections with a sidewalk on one side only, and sections with no sidewalks, as well as off-street public walkways and multi-use pathways. In general, many local streets east of Sandys Street have a sidewalk on at least one side of the street, while most local streets west of Sandys Street do not have a sidewalk.

Figure 3: Existing Sidewalks and Off-Street Public Walkways



There is a midblock pedestrian signal (MPS) across McNaughton Avenue, 45 metres west of Craven Drive. This MPS is near the west limits of the Tecumseh Public School property and connects to an off-street path that extends along the west boundary of the school property. The next adjacent controlled pedestrian crossings across McNaughton Avenue are located as follows:

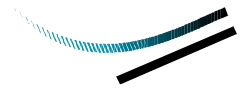
- 330 metres to the west: signalized intersection at Baldoon Road; and
- 595 metres to the east: signalized intersection at Sandys Street.

2.2 Existing Traffic Volumes

Existing traffic volumes on McNaughton Avenue, as well as existing pedestrian crossing activity at the MPS, were surveyed in the field on Friday, February 2, 2018. Traffic data were collected over an 8-hour period, subdivided between the following intervals:

- 7:30 AM – 9:30 AM;
- 11:00 AM – 12:30 PM;
- 1:00 PM – 2:30 PM; and
- 3:00 PM – 6:00 PM.

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These times were selected to coincide with peak periods for traffic on McNaughton Avenue and for pedestrian activity associated with Tecumseh Public School.

Field surveyors recorded eastbound and westbound traffic on McNaughton Avenue. Timestamps were recorded for each vehicle movement, measured to the nearest second, based on when the vehicle crossed the painted MPS crosswalk. The surveyors also recorded timestamps for every time that a walk signal was displayed at the MPS, and counted the number of pedestrians crossing at the MPS and in the general area upstream and downstream from the MPS.

Figure 4 illustrates the traffic volume in each 15-minute interval. Table 1 summarizes the peak and total 8-hour volumes.

Table 1: Peak Hour / 8-Hour Traffic Volumes on McNaughton Avenue

	AM peak hour		Midday peak hour		PM peak hour		8-hour total	
	Volume	% HV	Volume	% HV	Volume	% HV	Volume	% HV
Westbound	449	0%	394	1%	521	2%	3,265	1%
Eastbound	467	1%	387	0%	516	2%	3,271	1%
Total	916	1%	781	1%	1,037	2%	6,536	1%

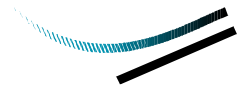
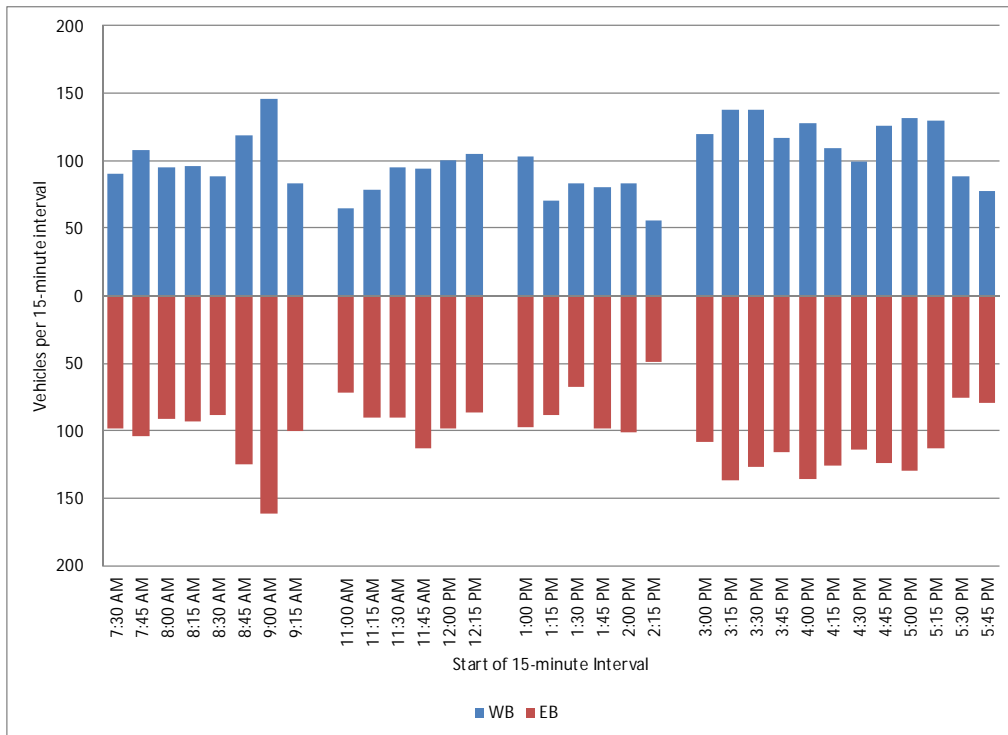


Figure 4: 15-Minute Traffic Volumes on McNaughton Avenue



The pedestrian signal was only observed to be called three times during the 8-hour period (at 7:50 AM, at 9:20 AM, and at 1:22 PM). The number of pedestrians walking along McNaughton Avenue and not crossing the street was observed to be 11 prior to school start and 21 following the end of the school day).

2.3 Mid-Block Pedestrian Signal Warrant

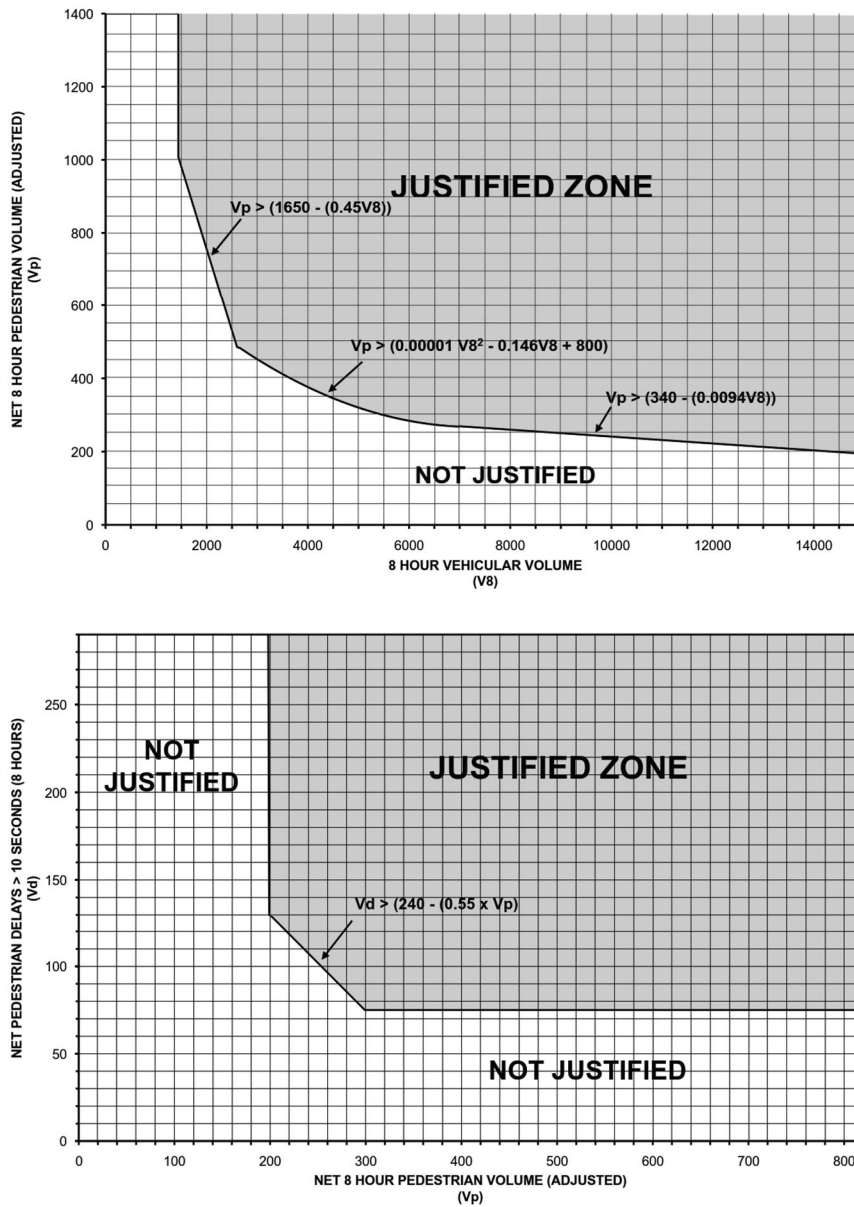
The pedestrian crossing demand and traffic demand were compared against warrant thresholds for pedestrian traffic signals, as published by the Ministry of Transportation of Ontario (MTO) in the Ontario Traffic Manual (OTM), Book 12. The OTM warrant thresholds for a pedestrian signal are related to two factors:

- The total 8-hour volume of pedestrian crossing demand compared against the total 8-hour volume of vehicle traffic; and
- The total 8-hour volume of pedestrian crossing demand compared against the number of those pedestrians that were delayed by 10 seconds or more while making their crossing.

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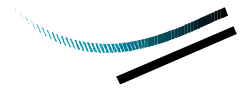
Figure presents the warrant graphs from OTM Book 12.

Figure 5: Mid-Block Pedestrian Signal Warrant Graphs



The existing 8-hour traffic volume traveling along McNaughton Avenue is 6,536 vehicles. To warrant a pedestrian signal at those traffic levels, there would need to

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be at least 275 pedestrians crossing the street over the same 8-hour period, of which approximately 90 would need to be delayed by 10 seconds or more.

The pedestrian totals are adjusted so that “assisted” pedestrians are equivalent to two “non-assisted” pedestrians. “Assisted” pedestrians are defined as “children under the age of 12, senior citizens, disabled pedestrians and other pedestrians requiring special consideration or assistance,” and include any adults that are accompanying the assisted pedestrian.

The traffic and pedestrian survey only recorded 3 “unassisted” pedestrians crossing McNaughton Avenue at the existing MPS. This demand is well below the signal warrant threshold and thus the existing traffic signal is not technically warranted based on existing traffic and pedestrian activity.

3.0 Future Conditions

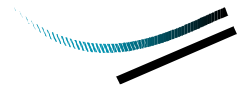
3.1 Future Pedestrian Crossing Demand

The existing pedestrian crossing demand in the vicinity of the school is low. This reflects the fact that only 63 students attending Tecumseh Public School live south of McNaughton Avenue, and of those that do, 57 live east of Sandys Street and have another opportunity to cross McNaughton Avenue at the Sandys Street signalized intersection.

In the 2018–19 school year, there are 211 students projected to be attending the consolidated Tecumseh Public School that live south of McNaughton Avenue and are not eligible for busing. The east-west distribution is estimated to be approximately as follows:

- 22% (46) west of Baldoon Road;
- 33% (69) between Baldoon Road and Sandys Street; and
- 45% (96) east of Sandys Street.

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There are signalized intersections on McNaughton Avenue at Baldoon Road and at Sandys Street, which would provide an opportunity to cross the street for students living west of Baldoon Road or east of Sandys Street. Therefore, the MPS (or another crossing in the vicinity) would need to accommodate approximately 69 students living between Baldoon Road and Sandys Street.

Each student that walks to school would generate two crossings (one before school and one after school). In addition, the crossing demand would depend on the following factors:

- The percentage of students that walk to school (vs. being dropped off or picked up in a private vehicle); and
- The number of students that are accompanied by an adult vs. the number that walk alone or in a group of students. (Each adult would add two crossings — one with the student, and one alone, such as an adult returning home after dropping off a student.)

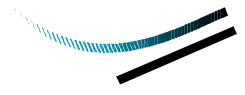
If all students walk to school, there would be 138 pedestrian crossings between Baldoon Road and Sandys Street. Adjusting for the assisted pedestrian weighting, there would be 276 adjusted pedestrian crossings. This number would be higher depending on the number of adults accompanying children to school, but would be lower depending on the proportion of students that are driven to/from school.

3.2 Mid-Block Pedestrian Signal Warrant

The mid-block pedestrian signal warrant results were re-assessed to account for growth in pedestrian activity associated with the school restructuring.

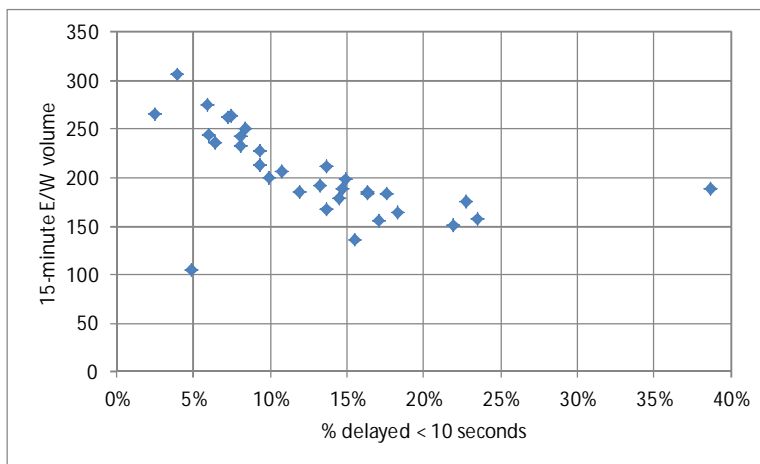
Normally the pedestrian signal warrant is based on observations of existing activity. In this case, the pedestrian demand does not currently exist because most students living south of McNaughton Avenue currently attend John N. Given Public School and do not need to cross McNaughton Avenue. The magnitude of future pedestrian crossing demand can be estimated (as discussed in *Section 3.1*), but the number of pedestrians delayed by 10 seconds or more cannot be observed. Further, because there is already a pedestrian signal west of Craven Drive, the proportion of delayed pedestrians cannot be observed. Instead, the timestamps generated during the traffic count were used to estimate the number of usable gaps and the proportion of pedestrians that would be able to cross with no delay or with a delay of less than 10 seconds in the event that the existing MPS was not present.

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The proportion of delayed pedestrians was determined by calculating the duration of each gap between successive vehicles, and calculating the proportion of time when a gap was observed that was long enough to cross the road. This was estimated to be approximately 10 seconds (based on a 9.5-metre crossing distance at 1.2 m/s, plus a 2-second clearance period). Overall, assuming pedestrians arrive at the crossing location randomly, it is estimated that 87% would be delayed by at least 10 seconds. The proportion varies throughout the day, with a close correlation to traffic volumes (as illustrated in *Figure 6*).

Figure 6: Correlation between Traffic Volumes and Pedestrian Crossing Delays



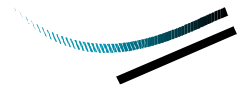
As noted in *Section 2.3*, given the existing volume of traffic on McNaughton Avenue, a demand of at least 275 (adjusted) pedestrian crossings would be required, of which at least 90 would need to wait for 10 seconds or more, to warrant a signalized pedestrian crossing.

The future pedestrian crossing demand at the Tecumseh Public School MPS would be approximately 276 (adjusted) pedestrians (plus accompanying adults) if all students walk to school.

As such, it is possible that the volume of pedestrian crossing demand in September 2018 would be high enough to warrant an MPS, and the proportion of delayed pedestrians would also be high enough to meet the warrant.

Based on the distribution of student residences between Baldoon Road and Sandys Street and the likely routes that would be taken to reach McNaughton Avenue West,

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there would be merit in relocating the existing MPS to the east to better serve the pedestrian crossing demand associated with the Tecumseh Public School.

Between Baldoon Road and Sandys Street, students would approach McNaughton Avenue West from the south via either Craven Drive or Truro Road. A pedestrian signal could be located between these two intersections at a location that is agreeable to the Municipality of Chatham-Kent.

Since more students are likely to be arriving from the east (including some students east of Sandys Street who may choose to not cross at the signalized Sandys Street intersection with McNaughton Avenue West), a pedestrian signal would likely be more well utilized towards the east end of this section.

The proposed school driveways present a number of vehicle conflict points which should be avoided – as motorists enter and exit the school property, they will be concentrating on vehicular gaps along McNaughton Avenue West, so adding another element (signalized pedestrian crossing) to that decision-making process is not recommended. Further, during peak school times (just before and after school), the usage of a pedestrian crossing signal will result in delays to motorists accessing and egressing the school property. If the pedestrian crossing was located on the west leg of the McNaughton Avenue West and Northland Drive intersection (as an Intersection Pedestrian Signal), it would be situated far enough away from the school driveway turning movements, and still be close enough to the school to capture student pedestrian crossings from the east.

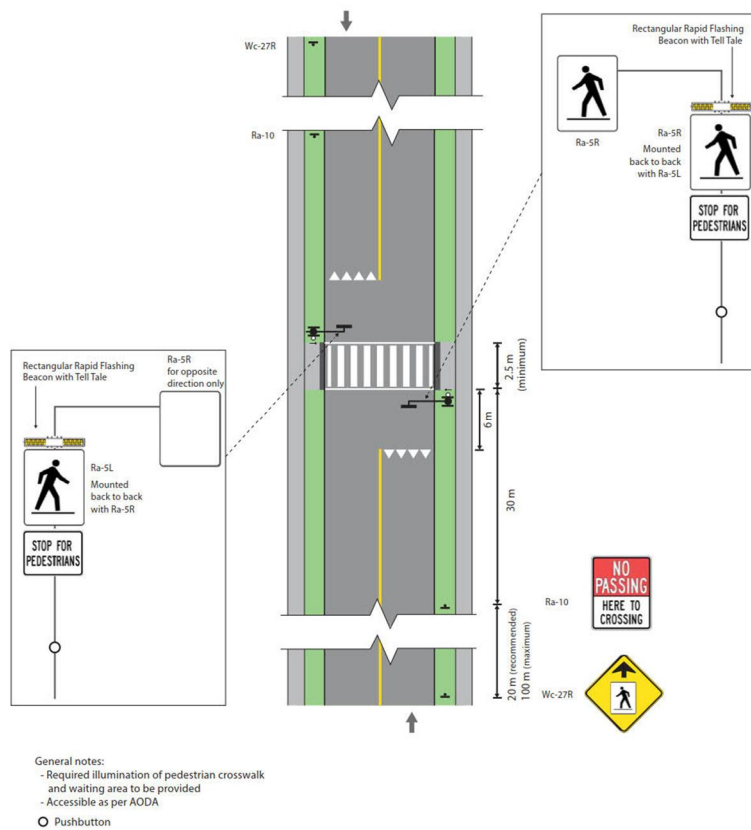
While having an Intersection Pedestrian Signal at Northland Drive would address student crossing demands from the east, it would leave those students who approach from the south via Craven Drive without a convenient protected crossing facility (since those students are unlikely to travel west to the Baldoon Road signal or east to a potential crossing location at Northland Drive).

Since the pedestrian crossing volumes are not sufficient to warrant a second pedestrian signal, the Municipality of Chatham-Kent may consider simply retaining existing midblock pedestrian crossing to the west of Craven Drive (to address those students arriving from Craven Drive) and adding a Level 2 Type B pedestrian crossover to the east of the school (in the vicinity of Northland Drive) to address students from approach routes farther east. This would provide safe crossing opportunities for students approaching McNaughton Avenue West from Craven Drive and Truro Road.

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Figure 7 illustrates a Level 2 Type B pedestrian crossover treatment.

Figure 7: Level 2 Type B Pedestrian Crossover



4.0 Sidewalk Warrants

The Municipality of Chatham-Kent has a policy wherein sidewalks would be considered to be warranted under the conditions outlined in Table 2.

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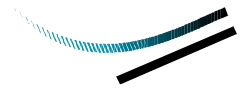


Table 2: Sidewalk Warrant Criteria

Roadway Classification	Warrant
Urban Arterial	Sidewalk warranted on both sides of the roadway
Urban Collector – Residential / Commercial Area	Sidewalk warranted on both sides of the roadway if the average annual daily traffic is greater than or equal to 2,500 vehicles per day
	Sidewalk warranted on only one side of the roadway if the average annual daily traffic is less than 2,500 vehicles per day
Urban Collector – Industrial Area	Sidewalk warranted on only one side of the roadway
Urban Local	Sidewalk warranted on only one side of the roadway if the average annual daily traffic is greater than or equal to 250 vehicles per day, greater than 150 metres in length or the roadway connects to an existing walkway, school or park
	Sidewalk is not warranted on the roadway if the average annual daily traffic is less than 250 vehicles per day, less than 150 metres in length and the roadway does not connect to an existing walkway, school or park

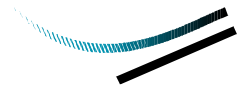
Daily traffic volume data was not available from the Municipality of Chatham-Kent for the local streets to the south of McNaughton Avenue West (in the vicinity of the Tecumseh Public School). As a proxy for estimating the amount of traffic (and correspondingly some potential pedestrian routes to the school), the distribution of residential properties south of McNaughton Avenue West was reviewed. This review identified the various roadway/street segments that would be used by not only motorists, but also potentially pedestrians, to access and egress the neighbourhood to the south of McNaughton Avenue West. Based on that review, it was found that the following street segments would likely have a volume of at least 250 vehicles per day (which is the minimum vehicular volume required for a local street to warrant consideration for a sidewalk) and would also form part of a route to/from the Tecumseh Public School for students:

- Craven Drive, between McNaughton Avenue West and Coatsworth Avenue;
- Coatsworth Avenue between Craven Drive and Truro Road; and
- Truro Road between McNaughton Avenue West and Coatsworth Avenue.

As such, these street segments should be considered for a sidewalk on one side of the street to better facilitate student pedestrian travel to/from the Tecumseh Public School.

Two other locations that should be monitored in the future are Crane Drive between McNaughton Avenue West and Lark Street and Craven Drive south of Coatsworth Avenue. Even though the population of students to the west of Baldoon Road is

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fewer than areas farther to the east, there will be some students that may walk from the neighbourhood around Lark Street to the Tecumseh Public School. A number of these students may travel east internally to Baldoon Road, and access the sidewalk along the east side of Baldoon Road to approach McNaughton Avenue West; however, it is possible that some will simply utilize Crane Drive to access McNaughton Avenue West. This pedestrian travel behaviour should be monitored.

Another potential route for monitoring is Craven Drive south of Coatsworth Avenue. This dead-end section of Craven Drive connects to the John N. Given Public School site as well as government buildings to the west. Instead of using Baldoon Road to access McNaughton Avenue West, some students from west of Baldoon Road may choose to travel along Courthouse Lane and utilize the off-street pathways (and across the pedestrian bridge over the McFarlane Drain) to access the south end of Craven Drive. An informal worn pathway connecting the bridge and the end of Craven Drive is visible now.

If through future monitoring this travel behaviour is noticed as being significant, a formal off-street pathway connecting the pedestrian bridge and Craven Drive should be considered. Given that 17 residences are along this section of Craven Drive, it is unlikely that the daily vehicular volume is significant enough to warrant a sidewalk on Craven Drive south of Coatsworth Avenue.

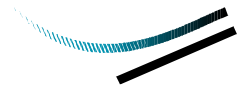
5.0 Summary

As a result of the closure of John N. Given Public School, student pedestrian travel to Tecumseh Public School will change. This study examined:

- whether the existing midblock pedestrian signal on McNaughton Avenue West near the Tecumseh Public School is warranted (based on current traffic and pedestrian activity);
- whether it the midblock pedestrian signal on McNaughton Avenue West would be warranted following the planned school reorganization;
- whether the pedestrian crossing is in the most appropriate location; and
- whether changes in walking patterns would result in sidewalks being warranted on streets where sidewalks do not currently exist.

The study analyses found that the existing midblock pedestrian signal on McNaughton Avenue West near the Tecumseh Public School is not warranted based on current traffic and pedestrian activity.

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The midblock pedestrian signal is warranted following the planned school reorganization (closure of John N. Given Public School and re-assignment of students to Tecumseh Public School).

The location of the existing midblock pedestrian signal is not well suited to address the primary travel directions of students attending the Tecumseh Public School (since the majority will be arriving from / departing to locations east of the school). However, the existing midblock signal would provide a safe crossing opportunity for students approaching McNaughton Avenue West from Craven Drive. For this reason, it is recommended that the existing midblock pedestrian signal be retained in its current location.

To address students approaching from farther east, a Level 2 Type B pedestrian crossover is recommended in the vicinity of Northland Drive. This location would allow pedestrian crossing movements to be sufficiently separated from the school driveways (to avoid conflicts with vehicle turning movements), and still be close enough to the school to capture student pedestrian crossings originating from the east.

The following street segments should be considered for a sidewalk on one side of the street to better facilitate student pedestrian travel to/from the Tecumseh Public School:

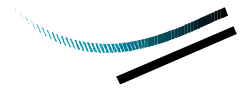
- Craven Drive, between McNaughton Avenue West and Coatsworth Avenue;
- Coatsworth Avenue between Craven Drive and Truro Road; and
- Truro Road between McNaughton Avenue West and Coatsworth Avenue.

Some additional monitoring of student walking patterns should be undertaken to determine if two other locations would warrant the installation of pedestrian facilities. These locations are:

- Crane Drive between McNaughton Avenue West and Lark Street; and
- Craven Drive south of Coatsworth Avenue.

The Crane Drive location would involve a sidewalk on one side of Crane Drive, while the Craven Drive location would involve formally connecting the south end of Craven Drive with an off-street pedestrian walkway – an informal worn pathway currently exists here - which connects to the pedestrian bridge over the McFarlane Drain.

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Should you have any further questions, please contact me at (416) 229-4647, extension 2376, or at mwalters@dillon.ca.

Yours sincerely,

DILLON CONSULTING LIMITED

Mike Walters, P.Eng.
Associate

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