

CONSEIL DES ÉCOLES CATHOLIQUES DU CENTRE-EST Transportation Impact Assessment

Proposed Elementary School, 925 Ralph Hennessy Avenue

July 17, 2018

Conseil des écoles catholiques du Centre-Est 4000 Rue Labelle, Ottawa, Ontario K1J 1A1

Attention: M. Denis Chabot Project Manager

Re: Transportation Impact Assessment Proposed Elementary School, 925 Ralph Hennessy Avenue

Dear M. Chabot:

Dillon Consulting Limited (Dillon) is pleased to submit this Transportation Impact Assessment (TIA) related to your site plan application for 925 Ralph Hennessy Avenue in Ottawa, Ontario.

Please do not hesitate to contact the undersigned should you have any questions.

Sincerely,

DILLON CONSULTING LIMITED

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Certification

- 1. I have reviewed and have a sound understanding of the objectives, needs, and requirements of the City of Ottawa's Official Plan and the Transportation Impact Assessment (2017) Guidelines;
- 2. I have a sound knowledge of industry standard practice with respect to the presentation of transportation impact assessment reports, including multimodal level of service review;
- I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering, or traffic operations; and,
- 4. I am either a licensed or registered professional in good standing, whose field of expertise is either transportation engineering or transportation planning.

Signature of individual certifier that s/he meets the above four criteria.



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1.0 Screening

1.1 Summary of Development

Municipal Address	925 Ralph Hennessey Avenue			
Description of Location	Riverside South, Phase 13, Southeast corner of Ralph Hennessy Avenue and Mount Nebo Way			
Land Use Classification	Institutional			
Development Size	2 storey elementary school and daycare 4,860 sq.m., 17 classrooms, 412 students, 40 staff, and 502 sq.m. daycare			
Number of accesses and locations	Driveway off Ralph Hennessy Avenue School bus layby on Ralph Hennessey Avenue Car layby on Mount Nebo Way			
Phases of development	1			
Build-out year	2019			

1.2 Trip Generation Trigger

The Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th edition,* indicates that an elementary school with 412 students would typically generate 268 vehicle trips during the weekday AM peak hour of the site and 140 vehicle trips during the weekday PM peak hour of the site. This exceeds the City of Ottawa's threshold of 60 person trips during the peak hour, therefore the trip generation trigger has been satisfied and a transportation impact assessment is required.

Land Use Type	Minimum Development Size	Yes	No
Single-family homes	40 units		х
Townhomes or apartments	90 units		х
Office	3,500 sq.m.		х
Industrial	5,000 sq.m.		x
Fast-food restaurant or coffee shop	100 sq.m.		х
Destination retail	1,000 sq.m.		х
Gas station or convenience market	75 sq.m.		x
Other	60 person trips or more during weekday peak hours	x	

Since the development satisfies the Trip Generation Trigger, both the Design Review and Network Impact Components will be addressed in the TIA study.

2.0 Scoping

2.1 Existing and Planned Conditions

2.1.1 Proposed Development

The proposed development is located at 925 Ralph Hennessy Avenue in the community of Riverside South. The site is currently zoned as I1A/R4Z Minor Institutional Zone which permits a school and daycare among other types of developments.

Figure 1 illustrates the location of the proposed development and site driveway. **Figure 2** illustrates the proposed site plan. The site is anticipated to be built and occupied in 2019.







2.1.2	Existing Conditions					
2.1.2.1	Roads and Traffic Control					
	The roadways under consideration in the study area are described as follows:					
	Ralph Hennessy Avenue Ralph Hennessy Avenue is a municipally-owned, two-lane Collector Road running north-south from Earl Armstrong Road to 80 metres south of Quartet Avenue; in the future it will extend south to Rideau Road. North of Earl Armstrong Road, the road is called Shoreline Drive.					
	Mount Nebo Way Mount Nebo Way is a municipally-owned, two-lane Local Road running east- west from Ralph Hennessy Avenue to the Thomas Gamble Municipal Drain. West of Ralph Hennessy Venue, the road is called Cambie Road.					
2.1.2.2	Walking and Cycling					
	Figure 3 illustrates the pedestrian and cycling facilities in the study area. The community of Riverside South is currently being developed and therefore there are limited walking and cycling facilities at this time.					
	Figure 3: Existing Welking and Cycling Bike Lane Path Ocycle Track Suggested Route Existing Sidewalks and Paths (2013) Existing Multi-Use Pathway (2013) Stating Multi-Use Pathway (2013) S					
2.1.2.3	Transit					
	Figure 4 shows the existing transit service near the proposed school. The transit stops are approximately 110 metres away from the entrance to the school.					



	Figure 4: Existing Transit Service Earl Armstrong						
	Riverview Cambie Transit stops 925 Ralph Hennessy Avenue Source: OC Transpo System Map, June 2018						
2.1.2.4	Traffic Management Measures						
	There are no traffic management measures in the study area.						
2.1.2.5	Traffic Volumes						
	The Riverside South community is rapidly developing and therefore existing traffic volumes were not collected since they would be of little value.						
2.1.2.6	Collision History						
	There have not been any reported collisions in the study area.						
2.1.3	Planned Conditions						
2.1.3.1	Road Network Improvements						
	Figure 5 shows the planned road network for the study area. Notable changes are that Ralph Hennessy Avenue will extend nearly to Rideau Road and Borbridge Avenue will extend east from Spratt Road to Limebank Road. The timing of the planned road network is unknown.						





Source: City of Ottawa 2013 TMP

2.1.3.2 Walking and Cycling

City of Ottawa policy is to provide a sidewalk on both sides of Ralph Hennessy Avenue because it is a Collector roadway. This is illustrated on the site plan (see Figure 2) and the cross-section for Ralph Hennessy Avenue (see **Appendix A**).

Figure 6 illustrates the planned walking and cycling facilities from the Riverside South Community Design Plan (CDP) Update. The CDP shows a Multi-Use Pathway (MUP) will be provided on one side of Mount Nebo Way, between Ralph Hennessy Avenue and the Thomas Gamble Municipal Drain. During the site plan approval process for the school, the design of Mount Nebo Way changed from a MUP on one side of the road to sidewalks on both sides of the road. The fully approved and registered site plan shows sidewalks on both sides of Mount Nebo Way and Ralph Hennessy Avenue.

Concrete pours for sidewalks are expected to occur near the proposed school in the Spring/Summer of 2019 and therefore they will be in place prior to the opening of the school.











Source: RSDC Phase 13 Traffic Impact Study (TIS) Update (Dillon, January 2016)

2.2 Study Parameters

2.2.1 Study Area

Figure 8 illustrates the proposed study area. The study area includes the proposed development and the intersections of Ralph Hennessy Avenue / Mount Nebo Way and Ralph Hennessy Avenue / Dreamcatcher Place / Site Driveway. The study area was limited in size since:

- 1. the trip generation of the school will govern the analysis and the peak hour of school traffic overlaps with the peak hour of roadway traffic only during the weekday AM peak hour;
- 2. the majority of the site trips will be diverted or pass-by trips that link to the school or daycare;
- 3. during the weekday AM peak hour, the primary trip generation will be contraflow the peak hour of roadway traffic, i.e. the majority of traffic on the roads will be leaving the residential neighbourhood (heading north on Ralph Hennessy Avenue), while teachers and school buses will be entering the residential neighbourhood (heading south on Ralph Hennessy Avenue); and,
- 4. the trip generation of the site will not have a significant impact on the signalized intersection of Earl Armstrong Road and Ralph Hennessy Avenue / Shoreline Drive.





2.2.2 Time Periods

The site includes a school and a daycare facility; the peak hours of the school traffic were considered to govern the analysis. The peak hour of school traffic coincides with the beginning and end of classes. Dillon observed site operations at an existing French catholic elementary school in Riverside South, École Bernard-Grandmaître, on Spratt Road and found that school buses arrive at approximately 9:00 AM and depart at approximately 3:30 PM. For the purpose of this study we considered the peak hours to be 8:15 AM – 9:15 AM and 3:00 PM – 4:00 PM.

2.2.3 Horizon Years

The school will be built-out in 2019 but much of the surrounding community will still be under construction. To simplify the analysis we will consider the 2024 horizon, 5 years after build-out of the site, when the surrounding community is more established.



The existing road network, illustrated in Figure 1, was assumed for the majority of this study except for Section 4.6 *Neighbourhood Traffic Management* which discusses the need for traffic calming. The ultimate road work, illustrated in Figure 5, is likely many years away.

The existing road network represents a "worst-cast" scenario since there is only one direction of approach to the proposed development.

2.3 Exemptions Review

Table 1 summarizes the exemptions review table from the City of Ottawa's 2017 Transportation ImpactAssessment Guidelines.

Module	Element	Exemption Consideration					
Design Review Component							
4.1 Development	4.1.2 Circulation and Access	Only required for site plans	Included				
Design	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt				
4.2 Deuking	4.2.1 Parking Supply	Only required for site plans	Included				
4.2 Parking	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt				
Network Impact Compo	nent						
4.5 Transportation Demand Management		Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Included				
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on Local or Collector streets for access <u>and</u> total volumes exceed ATM capacity thresholds	Included				
4.8 Network Concept		Only required when proposed development generates more than 200 person trips during the peak hour in excess of the equivalent volume permitted by established zoning					
4.9 Intersection Design	All Elements	Not required if site generation trigger is not met	Included				

Table 1: Exemptions Review



3.0 Forecasting

3.1 Development-Generated Travel Demand

3.1.1 Trip Generation and Mode Shares

Dillon used the trip generation of an existing French catholic elementary school in Riverside South to forecast trips at the proposed school. Trips generated by the daycare during the peak hour of school were included in the analysis but otherwise the analysis is governed by the trip generation of the school.

Dillon observed École Bernard-Grandmaître on Spratt Road on Tuesday, June 19th, 2018, from 8:15 AM to 9:15 AM and from 3:00 PM to 4:00 PM. **Table 2** summarizes the trip generation at the school.

Location	Site Peak AM Peak Hour 8:15 AM – 9:15 AM			Site Peak PM Peak Hour 3:00 PM – 4:00 PM		
	In	Out	Total	In	Out	Total
Staff Parking Lot						
Staff parking	25	0	25	0	23	23
Daycare drop-off / pick-up		37	74	29	29	58
On-Street & Off-Street Layby						
School buses	11	11	22	11	11	22
Student drop-offs / pick-up on Spratt Road		47	94	43	43	86
Total	120	95	215	83	106	189

Table 2: Trip Generation at École Bernard-Grandmaître

Table 3 compares the site characteristics of the existing school to the site characteristics of the proposed school. The site characteristics were provided by the school board.

Table 3: Site Characteristics

	École Bernard-Grandmaître	925 Ralph Hennessy Avenue French Catholic Elementary School		
Staff	59	40		
School buses	11	6 – 7		
Students	765	412		
Daycare	449 sq.m. *measured	502 sq.m.		

Table 4 summarizes the forecasted trip generation at the proposed school based on the information provided by the school board and the observed trip generation rate at École Bernard-Grandmaître, specifically:



- the ratio of staff (40/59) was used to scale the staff parking lot activity;
- the ratio of daycare size (449/502) was used to scale the daycare drop off activity;
- the school board indicated there would be 7 school buses;
- the ratio of the student population (412/765) was used to factor the number of student dropoffs / pick-ups; and,
- the school board estimated 10-15% of students would walk to school and ~10% of students would cycle to school.

· · · · · · · · · · · · · · · · · · ·				1			
Location		Site Peak AM Peak Hour 8:15 AM – 9:15 AM			Site Peak PM Peak Hour 3:00 PM – 4:00 PM		
	In	Out	Total	In	Out	Total	
Staff Parking Lot							
Staff parking	17	0	17	0	16	16	
Daycare drop-off / pick-up ¹		37	74	16	16	31	
On-Street Layby							
School buses	7	7	14	7	7	14	
Student drop-off / pick-up on Mount Nebo Way	25	25	51	23	23	46	
Active Transportation							
Walking (10-15% of students)	62	0	62	0	62	62	
Cycling (10% of students)		0	42	0	42	42	

Table 4: Trip Generation at 925 Ralph Hennessy Avenue

3.1.2 Trip Distribution

The school board provided the draft catchment area for the proposed school. The catchment area includes the majority of Greely, half of Manotick, roughly half of Metcalfe, and parts of Riverside South-Leitrim and Osgoode-Vernon.

The distribution of staff was based on the 2011 National Capital Origin-Destination (O-D) Survey which indicated that a large portion of trips to/from South Gloucester/Leitrim are within the area.

Table 5 summarizes the assumed trip distribution. Since the analysis considers the existing roadnetwork, the main direction of access to the site will be via Earl Armstrong Road and Ralph HennessyAvenue.

¹ During site observations at the existing school, the daycare drop-off / pick-up area in the staff parking lot was primarily used to pick-up students at the end of the school day. Therefore the trip generation for the daycare was based on the size of the daycare during the AM peak hour and the number of students during the PM peak hour.



Table 5: Assumed Trip Distribution						
Direction Percentage Students		Percentage Staff	Access via			
North	0%	55%	Earl Armstrong Rd. / Ralph Hennessy Ave. (north of site)			
East	5%	5%	Earl Armstrong Rd. / Ralph Hennessy Ave. (north of site)			
South	85%	35%	Earl Armstrong Rd. / Ralph Hennessy Ave. (north of site)			
West	10%	5%	Earl Armstrong Rd. / Ralph Hennessy Ave. (north of site)			
Total	100%	100%				

3.1.3 Trip Assignment

Since the analysis considers the existing road network, all vehicular traffic was assumed to approach the site via Earl Armstrong Road and Ralph Hennessy Avenue.

All school buses were assigned to the on-street layby (on Ralph Hennessy Avenue) and all parents dropping-off / picking-up students were assigned to the on-street layby for parents (on Mount Nebo Way). Assignment of pedestrians and cyclists was not considered for this analysis.

The site plan shows an on-street layby for school buses on Ralph Hennessy Avenue. School buses must be oriented northbound to use the layby, but no location is provided to turn around. Until the community is built-out, there will be a dead end on Ralph Hennessy Avenue just north of the future transitway; it was assumed that school buses inbound to the school would travel south on Ralph Hennessy Avenue and use the dead end to turn around. When the community is built-out, school buses will use other Collector or Arterial roads to orient themselves.

The site plan shows an on-street layby on Mount Nebo for parents dropping-off or picking-up students. It was assumed that parents would travel south on Ralph Hennessy Avenue, turn left on Mount Nebo Way, drop-off or pick-up students, and then turn right on Memorial Grove, right on Octave Grove, and right again on Ralph Hennessy Avenue, i.e. clockwise around the school.

The site plan shows a drop-off / pick-up for the daycare in the staff parking lot. Staff and parents using the daycare drop-off / pick-up were assumed to use the site driveway on Ralph Hennessy Avenue opposite Dreamcatcher Place.

Figure 9 illustrates the site generated trips for the weekday AM peak hour of the site. The weekday PM peak hour was not included since it does not overlap with the peak hour of roadway traffic.





3.2 Background Network Travel Demand

3.2.1 Transportation Network Plans

As the Riverside South community is built-out the transportation network will develop as illustrated in Figure 5. However, the timing is unknown and therefore the existing road network was considered for the analysis.

3.2.2 Background Growth

The study area roadways primarily serve the surrounding residential community. Traffic from the residential community has been accounted for explicitly and therefore background growth has not been considered.

3.2.3 Other Developments

The proposed school is within the RSDC Phase 13 development and therefore traffic from RSDC Phase 13 has been accounted for explicitly.

3.2.4 Traffic Volumes

Figure 10 illustrates the 2024 background traffic volumes which were obtained from the RSDC Phase 13 TIS Update. The weekday PM peak hour background traffic volumes were not included since the peak hour of the site does not overlap with the peak hour of roadway traffic.





3.3 Demand Rationalization

The total traffic demands are not expected to exceed the roadway capacity and therefore demand rationalization is not required.

3.4 2024 Total Traffic

Figure 11 illustrates the forecasted 2024 total traffic volumes, which were calculated by adding 2024 background traffic and site generated traffic.







4.0 Analysis

4.1 Development Design

4.1.1 Design for Sustainable Modes

Bicycle facilities: bike racks will be located at the south-east corner of the school, located next to the staff parking lot. There are direct and convenient paved surfaces to access all other areas of the school.

Pedestrian access and circulation: there are two primary entrances for the school and daycare on the west side of the building. Sidewalks on Ralph Hennessy Avenue and Mount Nebo Way provide direct access from the student drop-off layby to the school entrances. The sidewalk and paved surfaces around the school provide direct access from the school bus layby to the main school entrance. Paved surfaces around the school also provide direct and convenient access from the staff parking lot, bicycling parking area, and daycare drop-off / pick-up area to the main school entrance and daycare entrance.

Transit facilities: a transit stop is expected at the intersection of Ralph Hennessy Avenue / Mount Nebo Way, specifically the south east corner of the intersection. There are direct and convenient sidewalks and paved surfaces between the main school entrance and the transit stop.

Figure 12 illustrates the on-site pedestrian and cycling facilities.





4.1.2 Circulation and Access

There will be an on-street layby on Ralph Hennessy Avenue for school buses and an on-street layby on Mount Nebo Way for parents dropping off students. The school will have one driveway on Ralph Hennessy Avenue, opposite Dreamcatcher Place, for access to the staff parking lot. The staff parking lot also contains the waste bins and will function as a drop-off / pick-up area for the daycare.

School bus layby: the school bus layby will have space for six full length school buses. The school board indicated that the school will have seven school buses. The catchment area for the proposed school is quite large and therefore it is unlikely all seven school buses would be full size school buses. The school bus layby is expected to be adequate.

Parent drop-off / pick-up layby: the parent drop-off / pick-up layby will have space for five parked vehicles; it was limited in length so that it would not extend east through the intersection with Pathfinder Way. During site observations at École Bernard-Grandmaître, up to 25 vehicles were parked on Spratt Road at the end of the school day to pick-up students. Based on a parent pick-up rate of 25 vehicles / 765 students, we estimate up to 13 vehicles will arrive at the end of the school day to pick-up students at the proposed school. Since only five spaces are provided in the on-street layby, up to seven



vehicles may park on Mount Nebo Way east of the layby at the end of the school day. The end of the school day does not overlap with the weekday peak hour of road traffic and therefore this is not anticipated to cause issues.

Waste collection: the staff parking lot will have painted lines instead of concrete curb and therefore waste collection vehicles will be able to maneuver through the parking lot on weekends or after the school day has finished.

Daycare drop-off / pick-up area: the daycare drop-off / pick-up area will be within the staff parking lot. During site observations at École Bernard-Grandmaître, parents parked for several minutes in a hatched yellow "no parking" area to drop off children. The drop-offs to the daycare were spread out over the hour and no more than five vehicles were parked at a time. The proposed school has a similar size daycare and was assumed to operate similarly with similar requirement for drop-offs / pick-ups at the daycare facility, i.e. five vehicles parked at a time. The proposed school provides space for approximately four vehicles in a hatched area, and the proposed school will designate some parking spaces for "short term parking only" to accommodate additional demand for drop-off / pick-up parking spaces.

Figure 13 and **Figure 14**, respectively, illustrate the daycare drop-off / pick-up circulation observed at École Bernard-Grandmaître and the proposed circulation at the proposed school.



Figure 13: École Bernard-Grandmaître Daycare Drop-Off / Pick-Up Circulation









4.3 Boundary Street Design

4.3.1 Design Concept

The Multi-Modal Level of Service (MMLOS) was evaluated for Ralph Hennessy Avenue / Mount Nebo Way to assist with developing a design concept that maximizes the achievement of the MMLOS objectives.

Since the development is within 300 metres of a school (the site itself), it is subject to MMLOS targets of the school policy area (i.e. pedestrian LOS target is an "A"). Neither Ralph Hennessy Avenue nor Mount Nebo Way are identified as a Cross-town Bikeway, Spine route, or Local route and therefore the bicycle LOS target is technically a "D". Regardless, common sense would suggest a target of "A" or "B" for a school site since students and parents may walk and cycle to the school.

The cross-sections for the study area roadways are included in **Appendix A**. Ralph Hennessy Avenue will have a 26-metre cross-section as per City of Ottawa standards but Mount Nebo Way's 18-metre cross-section will deviate from City standards as it will have sidewalks on both sides of the road (the City of Ottawa standard shows a sidewalk only on one side of the road).

Table 6 presents the MMLOS conditions for roadway segments. The analysis shows that all MMLOStargets have been achieved. Mount Nebo Way is classified as a Local road and therefore it is reasonableto assume an operating speed of 30 km/h.

	Criteria	Target	Ralph Hennessy Avenue	Mount Nebo Way
	Sidewalk width		2 metres	1.8 metres
SO	Boulevard width		1.5 – 2 metres	0 metre
ian l	AADT > 3000?	^	No	No
estr	On-Street Parking	А	Yes	No
Ped	Operating Speed		30-50 km/h	<= 30 km/h
	Level of Service		Α	Α
	Type of facility		Mixed traffic	Mixed traffic
	Number of travel lanes		2	2
LOS	Bike lane width		n/a	n/a
ing	Operating speed	В	<= 40 km/h	<= 40 km/h
Cycl	Centreline (yes/no)		no	no
	Bike lane blockage frequency		n/a	n/a
	Level of Service		Α	Α
Ę	Type of facility		Mixed traffic	Mixed traffic
rans LOS	Parking/driveway friction		Limited / Low	Limited / Low
–	Level of Service		D	D

Table 6: MMLOS Conditions - Segments



4.4	Access Intersec	tion D	Design			
4.4.1	Location and Desi	gn of D) riveway			
	The site driveway is have a single lane ir	located and ou	d on Ralph it of the s	n Hennes ite.	sy Avenue oppo	site Dreamcatcher Way. The driveway will
4.4.2	Intersection Cont	rol				
	The site driveway w (TWSC) on the side recommended beca Manual (OTM) <i>Bool</i> 250 metres of anot Mount Nebo Way. Traffic volumes and Hennessy Avenue /	vill be lo streets use (a) k 5 Regu ner traff pedest Dream	cated on is approp traffic vol <i>Ilatory Sig</i> fic control rian cross catcher Pl	a low-vo riate. All lumes ar gns (Mar I device, ing volu ace / Sit	lume Collector r -Way Stop-Contr e not high enoug <i>ch 2000)</i> indicate i.e. AWSC at the mes should be m	oadway; therefore Two-Way Stop-Control rol (AWSC) at the intersection is not gh to warrant AWSC, and (b) Ontario Traffic es that AWSC should not be used within intersection of Ralph Hennessy Avenue / nonitored at the intersection of Ralph etermine if crossing guards are warranted.
	Hennessy Avenue /	Dream			e Driveway to de	termine in crossing guards are warranted.
4.4.3	Intersection Desig	n				
	Table 7 summarizes Place / Site Drivewa contains the interse The analysis shows stop control on Dre	the Syn y for th ection po that the amcatcl	nchro resi e 2024 to erforman e intersect her Place	ults for t tal traffice ce works tion will and at th	he intersection c c horizon during heets. operate well unc he site driveway.	of Ralph Hennessy Avenue / Dreamcatcher the weekday AM peak hour. Appendix B der TWSC. It is recommended to provide
	Table 7: Synchro Re	esults - I	Ralph Hei	nnessy A	venue / Dreamo	atcher Place/Site Driveway
	Approach		Two-W	/ay Stop	-Control	=
		LOS	Delay	V/C	Queue (m)	_
	Eastbound	В	11.1	0.02	0.7	_
	Westbound	A	9.4	0.02	0.7	_
4.5	Transportation	Dema	and Ma	nagem	ent	

The proposed school will have 40 staff and 412 students. The school board estimated 10-15% of students would walk to school and ~10% of students would cycle to school. Some students will likely be dropped off by their parents, but the majority of students will take the school bus. The majority of students are expected to arrive between 8:30 AM and 9:00 AM and leave at 3:30 PM.



4.0 **Analysis** 22

Based on observations at École Bernard-Grandmaître, the majority of staff are expected to drive to school. Staff are expected to arrive at least half an hour before school starts at 9:00 and leave at a short while after school ends at 3:30 PM.

Appendix C contains the TDM checklists. From the TDM checklists, some recommendations are as follows:

- display relevant transit schedules and route maps at entrances; and,
- provide shower and lockers for staff use (this is already provided).

4.6 Neighbourhood Traffic Management

The proposed school is located within a residential community and relies on Local and Collector roads for access. The 2024 total future traffic volumes (see Figure 11) are anticipated to be well below the capacity of Local and Collector roads and therefore a Neighbourhood Traffic Management plan is not required as per the TIA Guidelines. Regardless, maintaining low speeds on the roads bordering the school is important so the following section will discuss the need for traffic calming and potential treatments.

Mount Nebo Way is a Local road with a narrow 18-metre right of way in front of the school. There is 300 metres between the AWSC intersection at Ralph Hennessy Avenue and a sharp bend in the road. The potential for speeding on this section of road is limited by the design of the street & the network. Traffic calming is not recommended at this time.

Ralph Hennessy Avenue is a Collector road with a 26-metre right of way in front of the school. Currently there is 390 metres between the AWSC intersection at Mount Nebo Way and the temporary dead end. As a dead end, traffic speeds on Ralph Hennessy Avenue are not anticipated to be an issue.

When Ralph Hennessy Avenue is extended south in the future, traffic volumes will increase and traffic speeds may become an issue. If high traffic volumes and/or high speeds are observed, we recommend providing speed cushions on Ralph Hennessy Avenue between Mount Nebo Way and Octave Grove. Spacing should be 80 metres to 150 metres to maintain speeds between 40-50 km/h². The speed cushions will reduce 85th percentile speeds up to 8 km/h without significantly impacting buses, cyclists, resident access, street sweeping, or police enforcement. It may slightly affect emergency vehicle response time, transit route travel time, and snow plowing/removal.

4.7 Transit

The majority of trips to/from the proposed school will be via school bus or personal vehicle and therefore transit service will not be impacted in a meaningful way.

² Traffic Calming Speed Humps and Speed Cushions, Catherine Berthod, Ministère des Transports du Québec



Intersection	on De	esign											
Table 8 sum Way for the 2 intersection	marizes 2024 to perforr	s the Sy otal trai mance v	nchro ffic hor worksh	results for t izon during neets.	he int the w	ersecti eekday	on of I / AM p	Ralph Henne eak hour. A	essy A Appen	Avenue I dix B c	/ Mou ontain	nt Nebo s the	
configuration	guration. It is recommended that the intersection operate under AWSC since traffic volumes meet linimum Volume Warrant for an AWSC as per OTM <i>Book 5 Regulatory Signs</i> . Compliance with ge should be monitored at the intersection to determine if crossing guards are warranted. 8: Synchro Results – Ralph Hennessy Ave. / Mount Nebo Way												
configuration the Minimun signage shou Table 8: Syne	n. It is r n Volur Id be n c hro Re	recomm me War nonitor esults –	rant fo ed at t Ralph	that the information of the intersect the intersect Hennessy A	as per ion to	o deteri Mount	Book 5 mine if	F Regulatory f crossing gu	<i>v Sign</i> : uards	s. Comp are wa	c volui oliance rrante	mes meet e with d.	
configuration the Minimun signage shou Table 8: Syno Approach	n. It is r n Volur Id be n chro Re	recomm me War nonitor esults –	rant fo red at t Ralph AWSC	that the information of the intersect Hennessy A	ion to	Mount	Book 5 mine if t Nebc	Regulatory f crossing gu Way and SB	v Sign: uards	ce tram s. Comp are wa TWSC f	c volu oliance rrante or EB a	mes meet e with d. and WB	
configuration the Minimun signage shou Table 8: Syno Approach	n. It is r n Volur Id be n chro Re LOS	recomm me War nonitor esults –	Ralph AWSC	Hennessy A Queue (m)	as per ion to Ave. /	o detern Mount TWSC f	Book 5 mine if t Nebc	Regulatory f crossing gu Way and SB	v Sign: Jards	rwsc f	c volu pliance rrante or EB a V/C	mes meet e with d. and WB Queue (m	
configuration the Minimun signage shou Table 8: Syno Approach Northbound	n. It is r n Volur Id be n chro Re LOS A	ecomm ne War nonitor esults – Delay 8.4	Ralph AWSC V/C 0.22	A that the information an AWSC when the intersect Hennessy A Queue (m) 5.6	ion to	Mount TWSC f Delay 12.2	Book 5 mine if t Nebc or NB V/C 0.27	Regulatory crossing gu Way and SB Queue (m) 7.7	v Sign: Jards LOS A	re tram s. Comp are wa rwsc f Delay 0.0	c volu bliance rrante or EB a V/C 0.00	mes meet e with d. and WB Queue (m 0.0	
configuration the Minimum signage shou Table 8: Syne Approach Northbound Eastbound	n. It is r n Volur Id be n chro Re LOS A A	ecomm me War nonitor esults – Delay 8.4 8.2	Ralph AWSC 0.22 0.07	Queue (m) 5.6 1.4	as per ion to Ave. / LOS B A	Mount TWSC f Delay 12.2 7.4	Book 5 mine if t Nebc for NB V/C 0.27 0.03	Regulatory f crossing gu Way and SB Queue (m) 7.7 0.7	LOS A B	rwsc fr Delay 0.0 12.8	c volu bliance rrante or EB a V/C 0.00 0.10	mes meet e with d. and WB Queue (m 0.0 2.1	
configuration the Minimum signage shou Table 8: Syno Approach Northbound Eastbound Westbound	n. It is r n Volur Id be n Chro Re LOS A A A	ecomm me War nonitor esults – Delay 8.4 8.2 7.4	Ralph AWSC 0.22 0.07 0.02	Queue (m) 5.6 1.4 0.7	as per ion to ve. / LOS B A A	Mount TWSC f Delay 12.2 7.4 0.0	Book 5 mine if Nebc or NB V/C 0.27 0.03 0.00	Regulatory f crossing gu and SB Queue (m) 7.7 0.7 0.0	v Sign: uards LOS A B A	rwsc fr Delay 0.0 12.8 10.4	c volu bliance rrante or EB a V/C 0.00 0.10 0.03	mes meet e with d. and WB Queue (m 0.0 2.1 0.7	



5.0 Conclusions

Based on the transportation evaluation presented in this study, the proposed French Catholic Elementary School to be located at 925 Ralph Hennessy Avenue should be permitted to proceed from a transportation impact perspective.

- The proposed French Catholic elementary school is located at 925 Ralph Hennessy Avenue in the community of Riverside South. The anticipated build-out is 2019, at which time the school will have 17 classrooms, 412 students, 40 staff, and a 502 sq.m. daycare facility.
- The proposed school is forecasted to generate 156 auto trips during the weekday AM peak hour of the site and 107 auto trips during the weekday PM peak hour of the site. The trip generation from the site is not anticipated to have a significant impact on traffic operations at study area intersections.
- The intersection of Ralph Hennessy Avenue / Mount Nebo Way should operate under All-Way Stop-Control (AWSC) and the intersection of Ralph Hennessy Avenue / Dreamcatcher Place / Site Driveway should operate under Two-Way Stop-Control (TWSC).
- On-site parking for staff meets by-law requirements and the drop-off / pick-up area for the daycare should be adequate. The school buses layby should also be adequate.
- Display relevant transit schedules and route maps at entrances.
- Up to seven vehicles may park on Mount Nebo Way east of the layby at the end of the school day to pick-up students. The end of the school day does not overlap with the weekday peak hour of road traffic and therefore this is not anticipated to cause issues.
- Compliance with signage should be monitored at the intersection of Ralph Hennessy Avenue / Mount Nebo Way to determine if crossing guards are warranted.
- Traffic volumes and pedestrian crossing volumes should be monitored at the intersection of Ralph Hennessy Avenue / Dreamcatcher Place / Site Driveway to determine if crossing guards are warranted.
- At build-out, traffic volume and speed on Ralph Hennessy Avenue is not anticipated to be an issue.
- When Ralph Hennessy Avenue is extended south in the future, traffic volumes will increase and traffic speeds may become an issue. If high traffic volumes and/or high speeds are observed, we recommend providing speed cushions on Ralph Hennessy Avenue between Mount Nebo Way and Octave Grove.



Appendix A

Road Cross-Sections







Appendix B

Synchro Performance Worksheets





Intersection												
Intersection Delay, s/veh	8.2											
Intersection LOS	Α											
Maximum and	EDU	EDI	EDT	EDD	MDU	WDI	WDT	WDD	NIDLL	NDI	NDT	NDD
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBI	WBR	INBU	INBL	INBI	INBR
Vol, veh/h	0	45	5	0	0	0	5	15	0	0	185	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	45	5	0	0	0	5	15	0	0	185	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0
		50					1110					
Approach		FR					WB				NB	
Opposing Approach		WB					EB				SB	
Opposing Lanes		1					1				1	
Conflicting Approach Left		SB					NB				EB	
Conflicting Lanes Left		1					1				1	
Conflicting Approach Right		NB					SB				WB	
Conflicting Lanes Right		1					1				1	
HCM Control Delay		8.2					7.4				8.4	
HCM LOS		Α					А				A	

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	90%	0%	20%
Vol Thru, %	100%	10%	25%	67%
Vol Right, %	0%	0%	75%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	185	50	20	150
LT Vol	0	45	0	30
Through Vol	185	5	5	100
RT Vol	0	0	15	20
Lane Flow Rate	185	50	20	150
Geometry Grp	1	1	1	1
Degree of Util (X)	0.214	0.068	0.024	0.173
Departure Headway (Hd)	4.169	4.872	4.281	4.26
Convergence, Y/N	Yes	Yes	Yes	Yes
Сар	847	740	841	848
Service Time	2.265	2.873	2.284	2.26
HCM Lane V/C Ratio	0.218	0.068	0.024	0.177
HCM Control Delay	8.4	8.2	7.4	8.1
HCM Lane LOS	A	A	A	Α
HCM 95th-tile Q	0.8	0.2	0.1	0.6

HCM 2010 TW 3: Ralph Henn	/SC essy A	venu	ie & I	Moun	t Nebo W	ay			20 W	2. ee
Intersection	27									
Movement	2.1	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	
Vol, veh/h		45	5	0	0	5	15	0	185	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	45	5	0	0	5	15	0	185	0	30	100	20
Conflicting Peds, #/hr	20	0	20	20	0	20	20	0	20	20	0	20
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized			None			None	-		None	-	-	None
Storage Length		-	-	-	-	-	-		-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %		0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mymt Flow	45	5	0	0	5	15	0	185	0	30	100	20
Maior/Minor	Minor2			Minor1			Maior1			Maior2		
Conflicting Flow All	405	395	150	398	405	225	140	0	0	205	0	0
Stage 1	190	190	-	205	205	-	-		-	-		
Stage 2	215	205	-	193	200	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12		-	4.12		
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-		-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	556	542	896	562	535	814	1443		-	1366	-	
Stage 1	812	743	-	797	732	-	-	-	-	-	-	-
Stage 2	787	732	-	809	736	-	-		-	-	-	
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	510	508	860	526	501	781	1414		-	1338	-	
Mov Cap-2 Maneuver	510	508	-	526	501	-	-	-	-	-	-	-
Stage 1	796	710	-	781	717	-	-		-	-	-	
Stage 2	751	717	-	768	704	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.8			10.4			0			1.6		

 HCM Control Delay, s
 12.8
 10.4
 0
 1.6

 HCM LOS
 B
 B
 B
 1.6

 Minor Lane/Major Mvmt
 NBL
 NBT
 NBR EBLn1WBLn1
 SBL
 SBT
 SBR

 Capacity (veh/h)
 1414
 510
 685
 1338

 HCM Lane V(Ratio
 0.098
 0.022
 HCM Control Delay (s)
 0
 12.8
 10.4
 7.8
 0

 HCM Lane LOS
 A
 B
 A
 HCM 95th % tile Q(veh)
 0
 0.3
 0.1
 0.1

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Synchro 8 Report

HCM 2010 TWSC	2024 Total Traffic Volumes
6: Ralph Hennessy Avenue & Dreamcatcher Place/School access	Weekday AM Peak Hour (TWSC EW)

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	0	0	0	0	35	0	135	0	55	40	5
Conflicting Peds, #/hr	20	0	20	20	0	20	20	0	20	20	0	20
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized			None			None	-		None	-		None
Storage Length	-	-	-	-	-	-	-	-		-	-	-
Veh in Median Storage, #	ŧ -	0		-	0	-	-	0		-	0	-
Grade, %	-	0	-	-	0	-	-	0		-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	0	0	0	0	35	0	135	0	55	40	5
Maior/Minor	Minor2			Minor1			Maior1			Maior2		
Conflicting Flow All	346	328	83	328	330	175	65	0	0	155	0	0
Stage 1	173	173		155	155	-	-	-	-	-	-	-
Stage 2	173	155	-	173	175	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12		-	4.12		
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	608	591	976	625	589	868	1537	-	-	1425	-	-
Stage 1	829	756	-	847	769	-	-	-	-	-	-	-
Stage 2	829	769	-	829	754	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	542	545	937	582	543	833	1506	-	-	1396	-	-
Mov Cap-2 Maneuver	542	545	-	582	543	-	-	-	-	-	-	-
Stage 1	812	711	-	830	753	-	-	-	-	-	-	-
Stage 2	778	753	-	780	709	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	11.8			9.5			0			4.2		
HCM LOS	В			A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1\	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1506			542	833	1396	-	
HCM Lane V/C Ratio	-	-	-	0.018	0.042	0.039	-	-
HCM Control Delay (s)	0	-	-	11.8	9.5	7.7	0	-
HCM Lane LOS	A	-	-	В	A	Α	Α	-
HCM 95th %tile O(veh)	0		-	0.1	0.1	0.1	-	-

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Synchro 8 Report

HCM 2010 TWSC 3: Ralph Hennessy Avenue & Mount Nebo Way

2024 Total Traffic Volumes Weekday AM Peak Hour (TWSC NS)

Intersection													
Int Delay, s/veh	10.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	45	5	0	0	5	15		0	185	0	30	100	20
Conflicting Peds, #/hr	20	0	20	20	0	20		20	0	20	20	0	20
Sign Control	Free	Free	Free	Free	Free	Free		Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized		-	None	-		None				None			None
Storage Length		-		-	-	-		-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0			-	0	-	-	0	
Grade, %		0	-	-	0			-	0	-	-	0	
Peak Hour Factor	100	100	100	100	100	100		100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2		2	2	2	2	2	2
Mvmt Flow	45	5	0	0	5	15		0	185	0	30	100	20
Major/Minor	Major1			Major2			1	/linor1			Minor2		
Conflicting Flow All	40	0	0	25	0	0		208	155	45	241	148	53
Stage 1		-	-	-				115	115	-	33	33	
Stage 2		-	-	-	-	-		93	40	-	208	115	-
Critical Hdwy	4.12	-	-	4.12				7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1		-	-	-	-	-		6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2		-	-	-				6.12	5.52	-	6.12	5.52	
Follow-up Hdwy	2.218	-	-	2.218	-	-		3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1570	-	-	1589	-	-		749	737	1025	713	743	1014
Stage 1		-	-	-	-	-		890	800	-	983	868	-
Stage 2		-	-	-	-	-		914	862	-	794	800	-
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1538	-	-	1557	-	-		613	687	984	531	692	973
Mov Cap-2 Maneuver		-	-	-	-	-		613	687	-	531	692	-
Stage 1		-	-	-	-	-		847	761	-	935	850	-
Stage 2	-	-	-	-	-	-		774	844	-	572	761	-
Approach	EB			WB				NB			SB		
HCM Control Delay, s	6.7			0				12.2			11.8		
HCM LOS								В			В		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR WBL	WBT	WBR	SBLn1						
Capacity (veh/h)	687	1538		- 1557	-	-	677						
HCM Lane V/C Ratio	0.269	0.029	-		-	-	0.222						
HCM Control Delay (s)	12.2	7.4	0	- 0	-	-	11.8						
HCM Lane LOS	B	A	A	- A	-	-	В						
HCM 95th % tile Q(veh)	1.1	0.1	-	- 0	-	-	0.8						

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Appendix C

TDM Checklists





TDM-Supportive Development Design and Infrastructure Checklist:

Non-Residential Developments (office, institutional, retail or industrial)

	Legend
REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

TDM-supportive design & infrastructure measures: Non-residential developments			Check if completed & add descriptions, explanations or plan/drawing references
	1.	WALKING & CYCLING: ROUTES	
	1.1	Building location & access points	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	
	1.2	Facilities for walking & cycling	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (see Official Plan policy 4.3.3)	
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (see Official <i>Plan policy 4.3.12</i>)	

TDM-supportive design & infrastructure measures: Non-residential developments			Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks (see Official Plan policy 4.3.10)	
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps (see Official Plan policy 4.3.10)	
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on- road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see Official Plan policy 4.3.11)	
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	□ N/A for site plan application.
	1.3	Amenities for walking & cycling	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	N/A site is located near street
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	□ N/A school site

	TDM-s	supportive design & infrastructure measures: Non-residential developments	Check if completed & add descriptions, explanations or plan/drawing references
	2.	WALKING & CYCLING: END-OF-TRIP FACILI	TIES
	2.1	Bicycle parking	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see Official Plan policy 4.3.6)	 Bicycle parking is located next to staff parking lot. Parking lot assumed to have lights.
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well- used areas (see Zoning By-law Section 111)	
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see Zoning By-law Section 111)	
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	School will monitor bicycle parking spaces.
	2.2	Secure bicycle parking	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see Zoning By-law Section 111)	□ N/A for school
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	□ N/A for school
	2.3	Shower & change facilities	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	Shower provided for staff.
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	Teachers have access to lockable cupboard in classroom
	2.4	Bicycle repair station	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	□ N/A for school

TDM-supportive design & infrastructure measures: Non-residential developments			Check if completed & add descriptions, explanations or plan/drawing references
	3.	TRANSIT	
	3.1	Customer amenities	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	Shelter provided
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	□ N/A, shelter provided on-site
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	□ N/A for school
	4.	RIDESHARING	
	4.1	Pick-up & drop-off facilities	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	□ N/A for school
	4.2	Carpool parking	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	□ N/A for school
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	□ N/A for school
	5.	CARSHARING & BIKESHARING	
	5.1	Carshare parking spaces	
BETTER	5.1.1	Provide carshare parking spaces in permitted non- residential zones, occupying either required or provided parking spaces (see Zoning By-law Section 94)	□ N/A for school
	5.2	Bikeshare station location	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	□ N/A for school

TDM-supportive design & infrastructure measures: Non-residential developments			Check if completed & add descriptions, explanations or plan/drawing references
	6.	PARKING	
	6.1	Number of parking spaces	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	N/A parking meets zoning requirements
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	N/A for school
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly <i>(see Zoning By-law</i> <i>Section 104)</i>	□ N/A for school
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking <i>(see Zoning By-law Section 111)</i>	□ N/A for school
	6.2	Separate long-term & short-term parking areas	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	□ N/A for school
	7.	OTHER	
	7.1	On-site amenities to minimize off-site trips	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	□ N/A for school

TDM Measures Checklist:

Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER The measure could maximize support for users of sustainable modes, and optimize development performance

The measure is one of the most dependably effective tools to encourage the use of sustainable modes

	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	1.	TDM PROGRAM MANAGEMENT	
	1.1	Program coordinator	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	□ N/A for school
	1.2	Travel surveys	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	□ N/A for school
	2.	WALKING AND CYCLING	
	2.1	Information on walking/cycling routes & destination	ations
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	□ N/A for school
	2.2	Bicycle skills training	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	□ N/A for school
	2.3	Valet bike parking	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	□ N/A for school

	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	3.	TRANSIT	
	3.1	Transit information	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances	Recommended
BASIC	3.1.2	Provide online links to OC Transpo and STO information	N/A for school
BETTER	3.1.3	Provide real-time arrival information display at entrances	N/A for school
	3.2	Transit fare incentives	
		Commuter travel	
BETTER	3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	□ N/A for school
BETTER	★ 3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	N/A for school
		Visitor travel	
BETTER	3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	N/A for school
	3.3	Enhanced public transit service	
		Commuter travel	
BETTER	3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	N/A for school
		Visitor travel	
BETTER	3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	N/A for school
	3.4	Private transit service	
		Commuter travel	
BETTER	3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	N/A for school
		Visitor travel	
BETTER	3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	N/A for school

	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	4.	RIDESHARING	
	4.1	Ridematching service	
		Commuter travel	
BASIC ★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	N/A for school
	4.2	Carpool parking price incentives	
		Commuter travel	
BETTER	4.2.1	Provide discounts on parking costs for registered carpools	N/A for school
	4.3	Vanpool service	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	N/A for school
	5.	CARSHARING & BIKESHARING	
	5.1	Bikeshare stations & memberships	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	N/A for school
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	N/A for school
	5.2	Carshare vehicles & memberships	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	N/A for school
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	N/A for school
	6.	PARKING	
	6.1	Priced parking	
		Commuter travel	
BASIC ★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	N/A for school
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	N/A for school
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	N/A for school

TDM Measures Checklist

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	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	7.	TDM MARKETING & COMMUNICATIONS	
	7.1	Multimodal travel information	
		Commuter travel	
BASIC ★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	□ N/A for school
		Visitor travel	
BETTER ★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	□ N/A for school
	7.2	Personalized trip planning	
		Commuter travel	
BETTER ★	7.2.1	Offer personalized trip planning to new/relocating employees	□ N/A for school
	7.3	Promotions	
		Commuter travel	
BETTER	7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	□ N/A for school
	8.	OTHER INCENTIVES & AMENITIES	
	8.1	Emergency ride home	
		Commuter travel	
BETTER ★	8.1.1	Provide emergency ride home service to non-driving commuters	□ N/A for school
	8.2	Alternative work arrangements	
		Commuter travel	
BASIC ★	8.2.1	Encourage flexible work hours	N/A for school
BETTER	8.2.2	Encourage compressed workweeks	N/A for school
BETTER ★	8.2.3	Encourage telework	N/A for school
	8.3	Local business travel options	
		Commuter travel	
BASIC ★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	□ N/A for school
	8.4	Commuter incentives	
		Commuter travel	
BETTER	8.4.1	Offer employees a taxable, mode-neutral commuting allowance	□ N/A for school
	8.5	On-site amenities	
		Commuter travel	
BETTER	8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	□ N/A for school