Appendix A: Additional Traffic Controls

Courtland Avenue near Courtland Avenue Public School, City of Kitchener

A review of pedestrian crossing volumes along Courtland Avenue between Cedar Street and Peter Street from a recent survey showed that the adjusted pedestrian and cyclist crossing demand over a typical 8-hour period exceeds 100. As such staff assessed the justification of a Pedestrian Crossover (PXO).

The Region has adopted the provincial PXO warrants published in the Ontario Traffic Manual (OTM) Book 15 – Pedestrian Crossing Treatments. For a Level 2 PXO to be warranted, a minimum 100 adjusted pedestrians must be observed crossing the roadway during the highest 8-hour period. Based on the analysis of the volume of pedestrians crossing the roadway, the vehicular traffic on Courtland Avenue, and the roadway geometry, a Level 2 PXO – Type C is warranted at this location. Figure 1 provides an overview of a Level 2 PXO – Type C recommended on Courtland Avenue fronting Courtland Avenue Public School. A Level 2 PXO – Type C includes ladder crosswalks, regulatory “Stop for Pedestrians” signing, and flashers atop the signing.

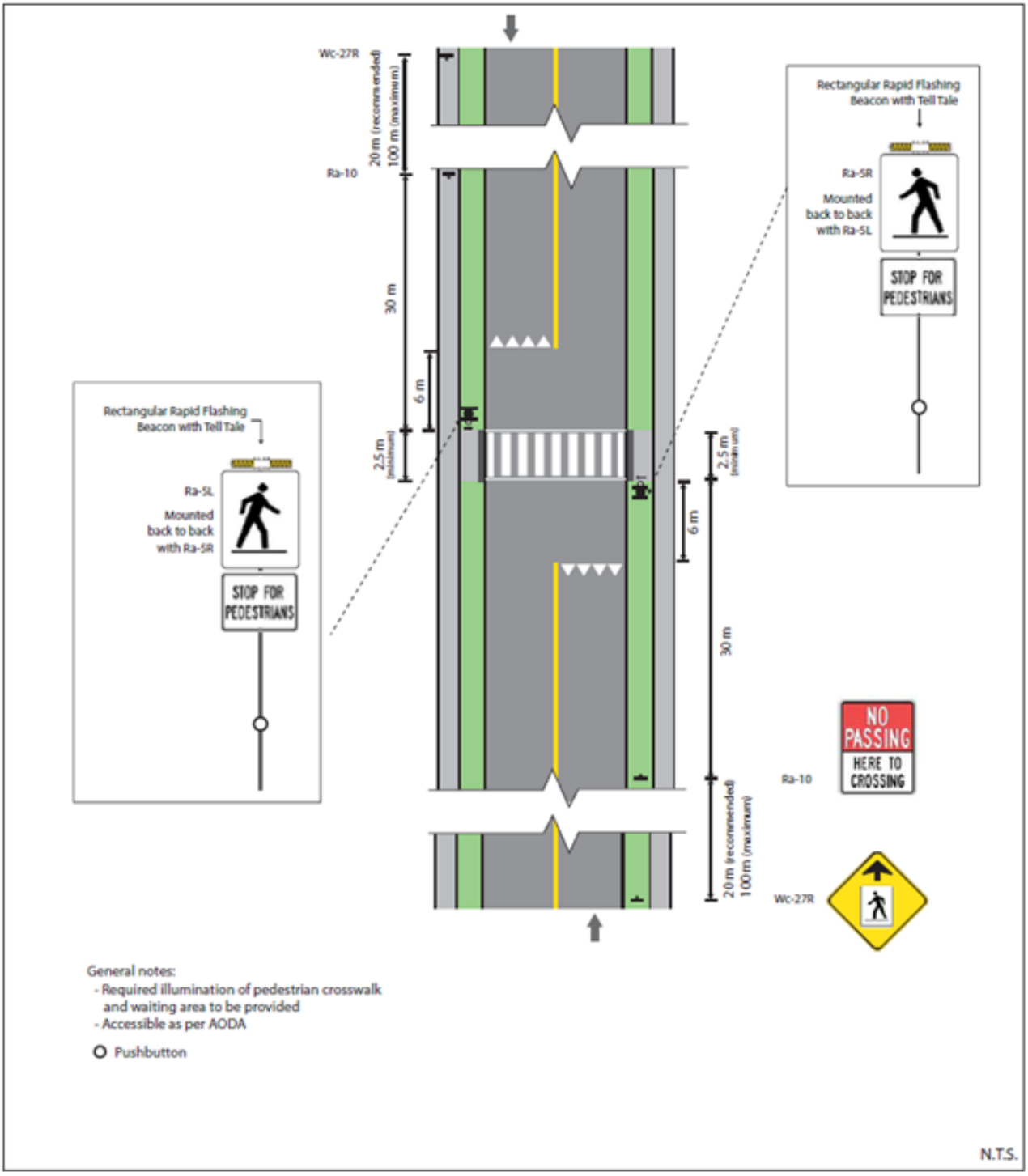


Figure 1: The image above shows a Level 2 PXO – Type C which includes ladder crosswalks, regulatory "Stop for Pedestrians" signing, and flashers atop the signing

Frederick Street at East Avenue, City of Kitchener

Frederick Street at East Avenue has an existing pedestrian refuge island just west of East Avenue to assist pedestrians crossing Frederick Street. Although there is an existing pedestrian refuge island, staff continue to receive concerns pertaining to the difficulty pedestrians experience crossing Frederick Street at East Avenue. As such, a traffic study was undertaken on Frederick Street at East Avenue to determine if additional pedestrian control is justified.

For a Level 2 PXO to be warranted, a minimum 100 pedestrians must be observed crossing the roadway in the highest 8-hour period. Through our survey, there was a total of 114 pedestrians and cyclists crossing Frederick Street at or near East Avenue. Based on the volume of pedestrians crossing the roadway, the vehicular traffic on Frederick Street, and the roadway geometry, a Level 2 PXO – Type B is warranted at the Frederick Street / East Avenue intersection. In this case, to leverage the existing infrastructure that has been implemented in the field, the Level 2 PXO is recommended to be installed at the existing pedestrian refuge island. A Level 2 PXO – Type B consists of ladder crosswalks, overhead and side-mounted regulatory “Stop for Pedestrians” signing, and flashers atop the side-mounted signing. Figure 2 below provides a visual of a Level 2 PXO – Type B that is recommended on Frederick Street at the existing pedestrian refuge island just west of East Avenue.

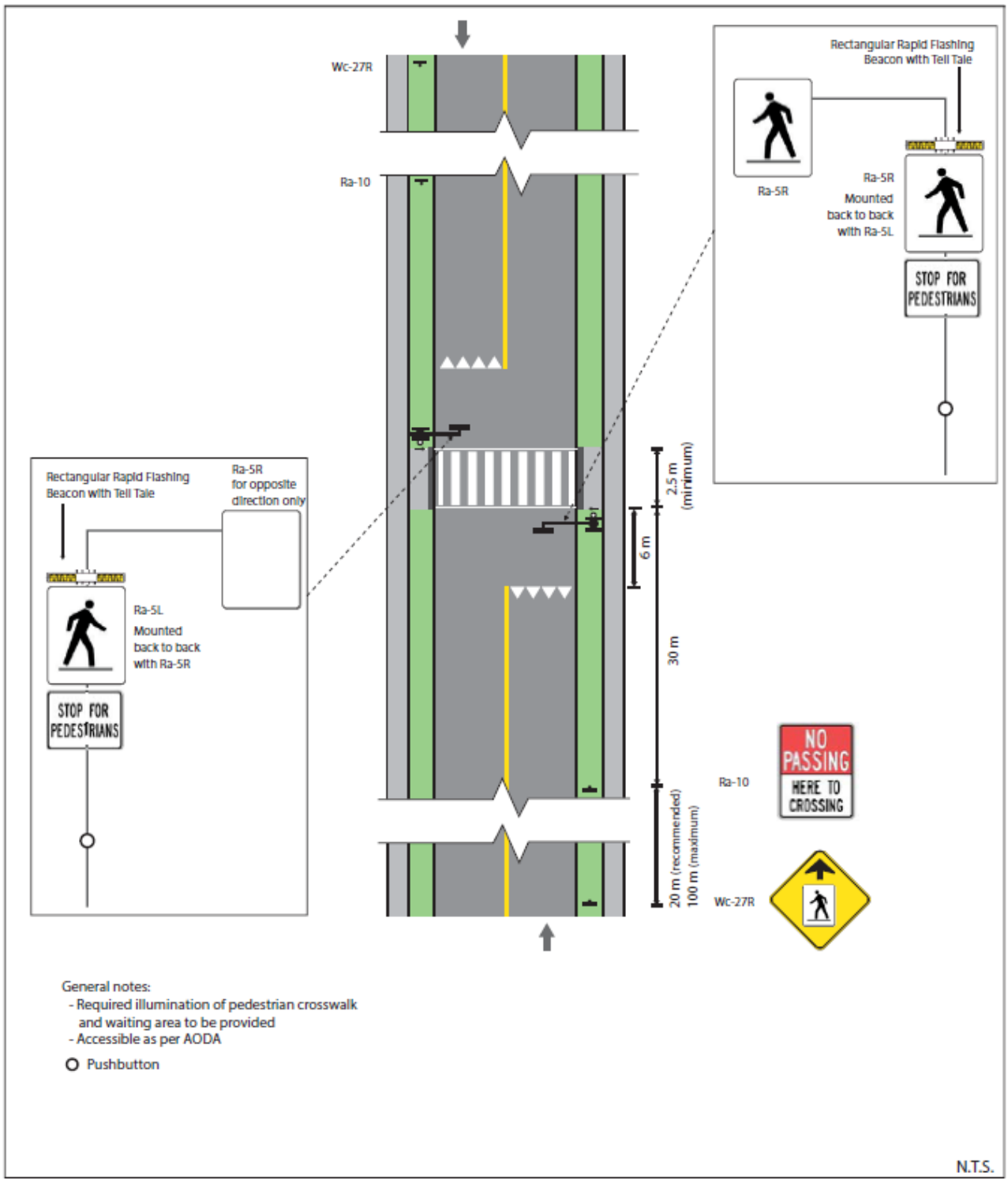


Figure 2: A Level 2 PXO – Type B consists of ladder crosswalks, overhead and side-mounted regulatory "Stop for Pedestrians" signing, and flashers atop the side-mounted signing.

Queen Street at the Joseph Schneider Haus, City of Kitchener

Through review, it was determined that there are typically around 480 pedestrians and cyclists crossing Queen Street fronting Joseph Snyder Haus. Applying the pedestrian volume to the provincial warrant for additional pedestrian control shows that the location on Courtland Avenue fronting Joseph Schneider Haus warrants a Level 2 Pedestrian Crossover (PXO). Based on the posted speed and existing geometry a Level 2 PXO - Type B is warranted. As previously noted, a Level 2 PXO - Type B PXO consists of consists of ladder crosswalks, overhead and side-mounted regulatory "Stop for Pedestrians" signing, and flashers atop the side-mounted signing. Please refer to Figure 2 above that shows a Level 2 PXO – Type B control.

St. Andrews Street at Gilholm Avenue, City of Cambridge

Staff assessed pedestrian crossing volumes along St. Andrews Street at Gilholm Avenue to determine if additional pedestrian control is warranted. A recent survey of the intersection shows that there are approximately 117 pedestrians crossing St. Andrews Street at Gilholm Avenue. There is an existing school crossing guard at this intersection to assist students crossing St. Andrews Street during the morning and afternoon school commute times. The crossing guard is located on the south side of the intersection and offset approximately 15 metres from the intersection of Gilholm Avenue.

As noted above, to warrant a Level 2 Pedestrian Crossover (PXO) there needs to be a minimum of 100 adjusted pedestrians observed crossing the roadway during the highest 8-hour period. Based on the volume of pedestrians crossing St. Andrews Street, a Level 2 PXO is warranted. The warranted type of PXO is the Type C which consists of ladder crosswalks, regulatory "Stop for Pedestrians" signing, and flashers atop the signing. Please refer to Figure 1 for an illustration of a Level 2 PXO – Type C.

Through discussion with City of Cambridge staff, it was noted that the City will consider removing the crossing guard at the St. Andrews location should a Level 2 PXO be approved. It was also noted that, if the crossing guard was determined justified following the installation of a Level 2 PXO, then the City will relocate the crossing guard to the new PXO.

Borden Avenue at the Iron Horse Trail Crossing, City of Kitchener

As per the resolution associated with TES-TRP-22-03 from April 2022, Regional Council approved the implementation of a Level 2 PXO along Borden Avenue at the Iron Horse Trail Crossing to facilitate the safe crossing of Borden Avenue for trail users. However,

following design consultations with the ION LRT operators and other key stakeholders, the staff recommendation has evolved to, instead, recommend a set of traffic signals. With the incorporation of Transit Signal Priority features, the signals will be able to operate in a manner to provide priority to the light rail vehicles (essentially, facilitating a seamless flow through the intersection) while also providing a safe, high quality experience for trail users. Inherently, a PXO may introduce delays to light rail vehicles and may also potentially increase high risk conflicts between trail users and the ION vehicles. Those issues are resolved through the introduction of traffic signals and, accordingly, the staff recommendation has changed to include a proposed set of traffic signals at this location.

Frederick Street near Suddaby Public School, City of Kitchener

A representative from Suddaby Public School requested a school bus loading zone on Frederick Street fronting Suddaby Public School. Currently, 2 school buses stop on Frederick Street in the morning and afternoon during drop off and pick up times.

Frederick Street is a 4-lane cross section with a posted speed limit of 40 km/h at Suddaby Public School. The existing Frederick Street geometry allows school buses to load and unload students within the curb-lane which effectively inhibits vehicular traffic from passing the loading/unloading school buses in both directions. Without a designated school bus loading zone, the operators of the school buses are required to activate their flashing red signals when loading or unloading students; effectively stopping all vehicular traffic in both directions. Under this condition, queuing of vehicles along Frederick Street is occasionally observed to block pedestrians crossing Frederick Street within the crosswalks at the Otto Street intersection.

A School Bus Loading Zone along Frederick Street, from 8 meters east of Irvin Street to 32 meters east of Irvin Street, would accommodate the length of 2 school buses. The loading zone would allow for the loading/unloading of students without the need for activation of flashing red signals (and the associated halting of traffic in both directions). Figure 3 shows the configuration of the proposed School Bus Loading Zone on Frederick Street in the vicinity of Irvin Street.

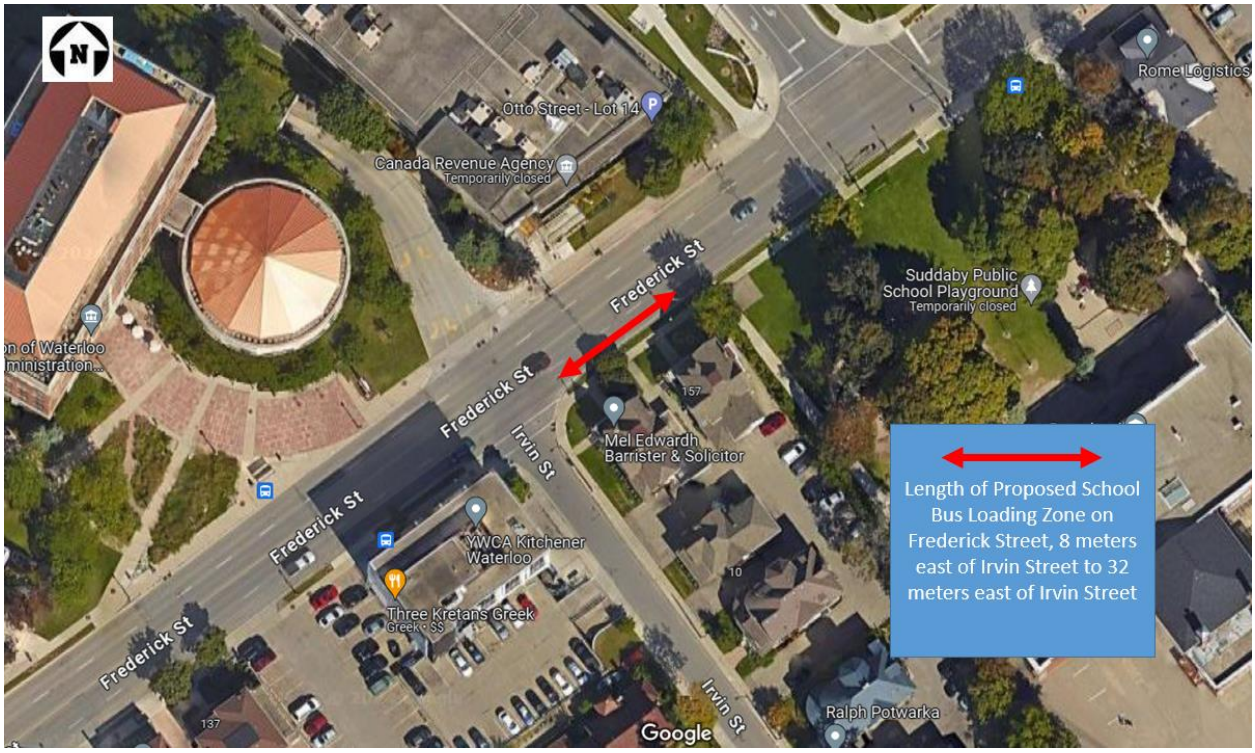


Figure 3: The Proposed School Bus Loading Zone on Frederick Street, in the City of Kitchener

Erb Street at University Avenue, City of Waterloo

To improve safety for cyclists travelling along Erb Street and University Avenue, a series of intersection design improvements have been introduced at the Erb Street & University Avenue intersection in Waterloo. One of these changes is the introduction of two-stage left-turn bike boxes which we typically deploy at intersections with on-road bicycle lanes and three or more lanes entering the intersection. The use of two-stage left-turn bike boxes are used in these situations with the recognition that the majority of cyclists would not be comfortable crossing two lanes of traffic to get into the left-turn lane.

Where space does not allow for the two-stage left-turn bike box to be placed behind the curb (i.e. out of the roadway), the bike box must be placed on-road. This on-road position leads to a potential uncomfortable conflict between cyclists waiting in the bike box and motorists making the right-turn movement during the red signal display. At the intersection of University Avenue and Erb Street, there are four on-road two-stage left-turn bike boxes, as illustrated in Figure 4.

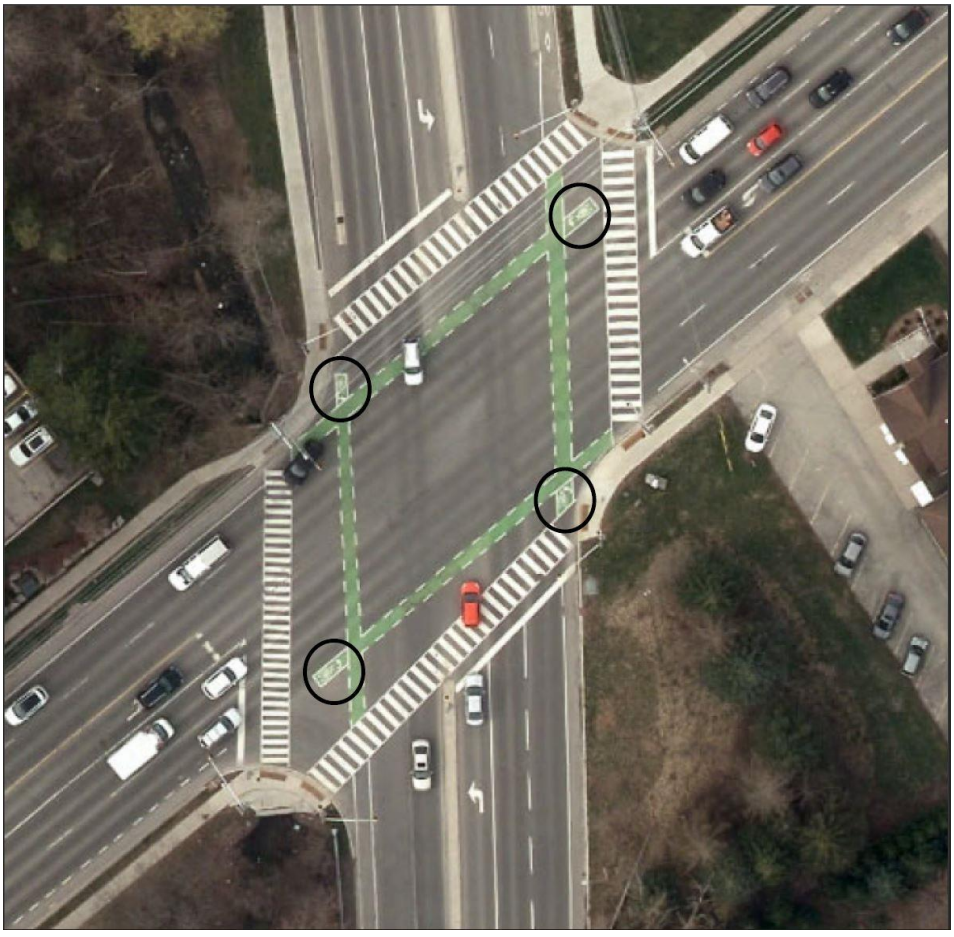
To reduce the risk for cyclists and to encourage more community members to feel safe on a bicycle at the Erb Street & University Avenue intersection, Right-Turn on Red (RTOR) restrictions should be enacted for all directions. An additional benefit is that

RTOR restrictions also effectively produce improved safety and comfort for pedestrians due to the elimination of a prevailing conflict between pedestrians and turning vehicles.

A traffic analysis confirmed that the implementation of RTOR restrictions would be expected to have little effect to the overall traffic operations under the current lane configurations and signal timings at Erb & University.

Accordingly, staff recommend the implementation of RTOR restrictions for all approaches to the Erb Street and University Avenue intersection.

Figure 4 - Bike Boxes at the Erb Street and University Avenue Intersection



Arthur Street at Whippoorwill Drive, Township of Woolwich

Regional staff have received public concerns around pedestrian safety at the Arthur Street & Whippoorwill Drive intersection in Elmira. Specifically, staff were requested to investigate opportunities to improve the protection of pedestrians who are crossing within the west crosswalk during the Pedestrian Walk phase and who have observed repeated failure-to-yield driving behaviour. To address this concern, staff investigated

the feasibility of introducing a right-turn-on-red (RTOR) prohibition on the eastbound approach.

Historically, Regional practice has been to consider a RTOR restriction based on collision history and based on a review of traffic operations. However, as Regional staff transition towards preventative safety measures rather than reactive ones, staff are currently changing our approach to consider risks based on real, lived experiences rather than implementing changes after collisions were documented at a location.

Until staff conduct a study to consider a wider use of RTOR restrictions around the Region (particularly, the more urban locations), the new direction is to favour a RTOR restriction at an individual intersection unless there are significant operational concerns which may be problematic (for example, queuing that could impact ION running times or introduce other unintended traffic safety concerns).

At the Arthur Street & Whippoorwill intersection, a review of the traffic operations indicated that eastbound right-turning motorists may experience an average of 15 to 20 seconds of additional delay during the morning and afternoon peak periods with the introduction of an RTOR restriction. Even with the RTOR restriction, the eastbound right-turning motorist experience would still fall comfortably within what is widely considered to be good service (i.e. Level-of-Service rating of C). On the flipside, pedestrians would see a significant improvement in comfort and safety and this has the potential upside of attracting more members of the community to feel safe in walking or rolling around their neighbourhood.

Since there is currently an advanced northbound left-turn phase and supportive roadway geometry, there is an opportunity for staff to introduce a simultaneous eastbound right-turn phase that would reduce the amount of red display time for eastbound right-turning motorists. This additional signal modification would help to offset some of the delay impacts of the new RTOR restriction.

In terms of collision history: a review of the five-year period between 2017 and 2021 showed no identifiable collisions involving eastbound right-turning motorists from Whippoorwill Drive onto Arthur Street. However, as noted above, the absence of collision history does not mean that there are no opportunities to improve the comfort and safety for pedestrians at the intersection.

Based on our assessment of the Arthur Street and Whippoorwill Drive intersection, staff recommends the adoption of an eastbound RTOR restriction. This change requires a by-law update, as outlined in TSD-TRP-24-005.

Bleams Road Posted Speed Reduction

As part of a reconstruction project (Project #05705), Bleams Road will be redesigned between Trussler Road and Fischer-Hallman Road with a new, urbanized cross-section. The new roadway design will be configured to facilitate lower speeds of 50 km/h and include a series of roundabouts and adjacent active transportation facilities. In order to match the new design speed, staff are recommending a lowering of the posted speed limit to 50 km/h along this entire stretch, to be enacted when the construction project is completed.

Per the latest project schedule, the Bleams Road reconstruction is scheduled to start in May 2024. The first reconstructed section of Bleams Road (Fischer-Hallman Road to Forestwalk Street) should open to traffic in approximately in August 2024 with the reduced speed limit, followed by the section from Forestwalk Street to Donnenwerth Drive in December 2024, followed by the section from Donnenwerth Drive to Trussler Road in the summer of 2025.