Darryl:

CycleWR is pleased to see the Region implementing a pilot program to test various options for improving cyclist and pedestrian safety at the Region's roundabouts. We think that both ideas (raised crossings and push button warning lights) would improve safety at all of the current roundabouts in the Region.

However, we think the options for review are too limited. They fail to address the underlying safety issues that are inherent in the Region's traditional roundabout designs. The traditional design deliberately emphasizes movement and speed of cars going through the roundabouts. It also deliberately forces cyclists (if they wish to obey the law) to dismount and walk through the roundabout.

There are clearly established better practices in other countries. The Netherlands urban roundabout design standards are an obvious benchmark. Here are some suggestions, based upon Dutch principles and/or our own observations here in Canada:

1. There should be a bidirectional cycling facility included with all roundabouts. This gives options to cross the minimum number of car lanes, depending on where you are headed after the roundabout. We believe this is already standard practice.
2. There should be traffic safety islands between the two directions of car lanes at each entrance/exit, and between the slip lane (if any) and the main lanes. The safety island

should be big enough to allow a cargo bicycle to stop safely on the island. We believe this is already standard practice.

3. Crossrides should be a standard design inclusion at roundabouts, just as they should be wherever a proper cycling facility crosses through an intersection. This will allow cyclists to cross the roundabout legally without stopping and give cyclists priority over cars when riding across the roundabout. Crossrides should be placed beside the crosswalk, but further away from the roundabout circle. This gives the cyclist more room to identify that the car is leaving the roundabout, and the driver to see that there is a cyclist crossing as they are leaving the roundabout.
4. Radial designs (as in The Netherlands and some other European countries) should be the default design. They have sharper turns when entering and exiting the roundabout circle, forcing cars to slow down. The exits in the Region's standard tangential design are especially unsafe for cyclists and pedestrians. They are almost a straight line, allowing much faster exit speeds. See the picture and graphic at the bottom of this document.
5. Push button flashing lights are helpful for pedestrians, but not that helpful for cyclists if they are going to ride across. Is it possible to use motion sensors or raised buttons to activate the lights for approaching cyclists?
6. Roundabouts should be designed with the minimum number of lanes that will handle the expected traffic. Projections that assume traffic will increase in line with targeted population growth should also assume reduction in traffic due to targeted modal share shift.

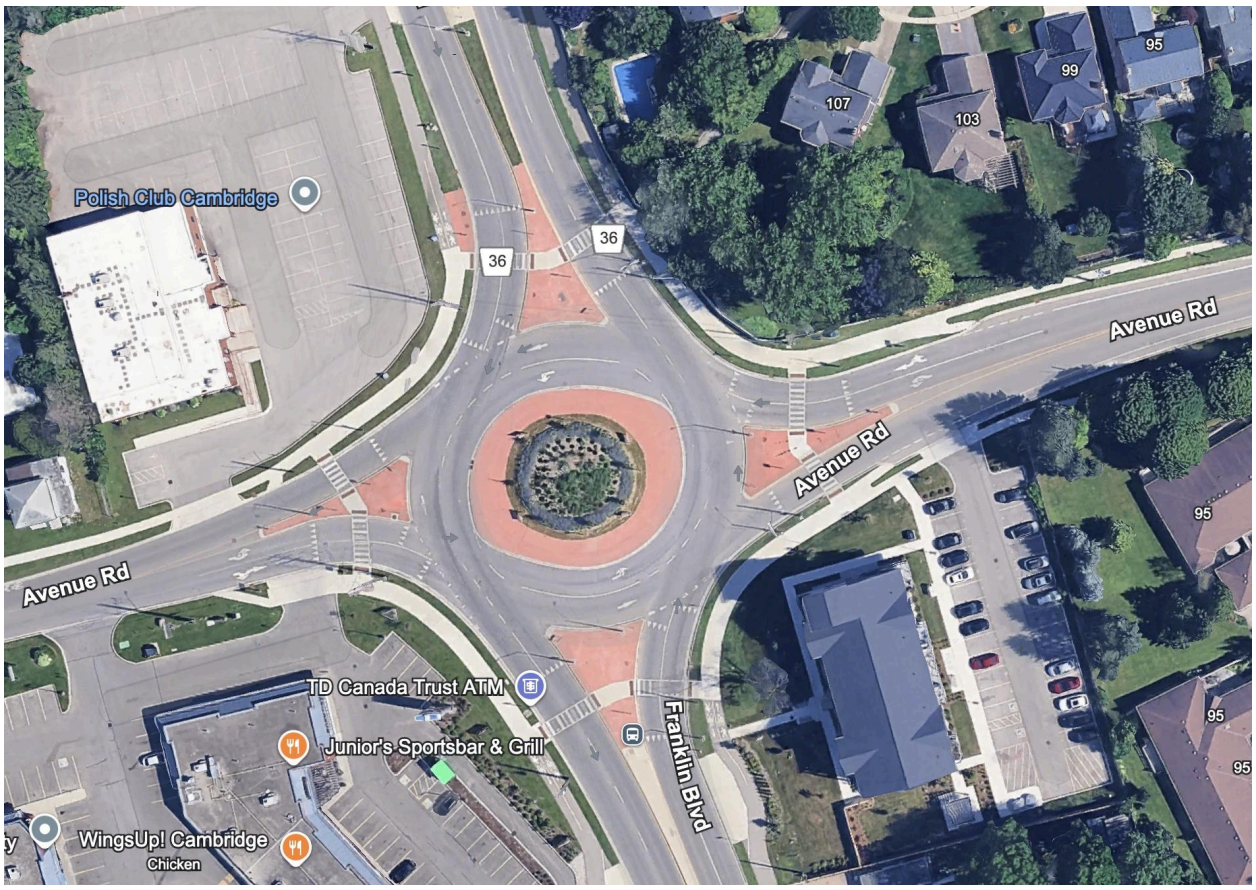
7. Where possible (less than about 25,000 cars in the roundabout per day is the Dutch standard) the roundabout should be one lane only. This makes for sharper turns, slower car speeds, and shorter crossing distances for cyclists and pedestrians.
8. Slip lanes encourage cars to speed through the turn. If slip lanes are required, they should have physical speed reductions prior to any pedestrian or cycling crossings (raised crossing, rumble strips, speed bumps, or lighted signage).
9. Dutch standards strongly suggest there should be under or overpasses for cyclists and pedestrians for four lane or wider road crossings. Many of the Region's roundabouts are of this type. One of the most recent designs (at Franklin Boulevard and Saginaw Parkway) includes an underpass - a huge step forward. While we recognize that crossings not at grade are expensive, they are also vastly safer. We think this approach should be the default design for any of the four "corners" of a roundabout where the total lanes in both directions, including slip lanes, exceeds four. In addition, the Region should set standards for when under or overpasses are (a) desirable and (b) required when there are four lanes of traffic at the "corners". Presumably this should be based on the volume of car traffic expected to enter and exit the roundabout at that corner. On high traffic corridors, at grade crossings with significant pedestrian/cyclist volumes either seriously frustrate the high speed traffic (if drivers obey the law) or seriously frustrate the low speed traffic (if as happens today, many drivers ignore the law, and it is unsafe and/or very slow for cyclists and pedestrians to cross).

10. Standard roundabout design should maximize sightlines for both drivers and cyclists. Drivers should have as long a lead time as possible to realize that a cyclist is definitely planning to cross the roadway in front of them. Today, the definitive turn to cross the roadway (rather than carry on straight) typically happens only 1-2 metres from the roadway. That distance should be 5 metres or even more wherever space allows that separation. If necessary, the cycling facility could bend away from the roadway just before the turn. This creates more space at the turning point, while minimizing the space required around the rest of the roundabout. See the picture and graphic at the end of this document.
11. The design should recognize that cyclists travelling counter clockwise (with traffic), have far higher risk than those cycling clockwise against traffic. When cycling with traffic on the roundabout, the standard design today forces cyclists to turn their back to the traffic of most concern to them. They cannot see that traffic until after the definitive turn to cross the road way, when they can look left to see the traffic they are about to cross. The same is true for cyclists approaching the roundabout “with traffic”. Again, that 5 metre (or greater) distance to the roadway after the turn is critical for them to have time to judge how safe it is to ride across the road. That five metres (or more) should be straight and perpendicular to the roadway, allowing an easy glance to the side for the cyclist to see the approaching traffic.
12. The typical Dutch roundabout has the cycling facility five metres from the roundabout roadway. That makes for a much more pleasant passage for cyclists (and pedestrians on our multi-use paths) than a more road-hugging design.

Five metres separation should be the default design in the Region, where there is sufficient space.

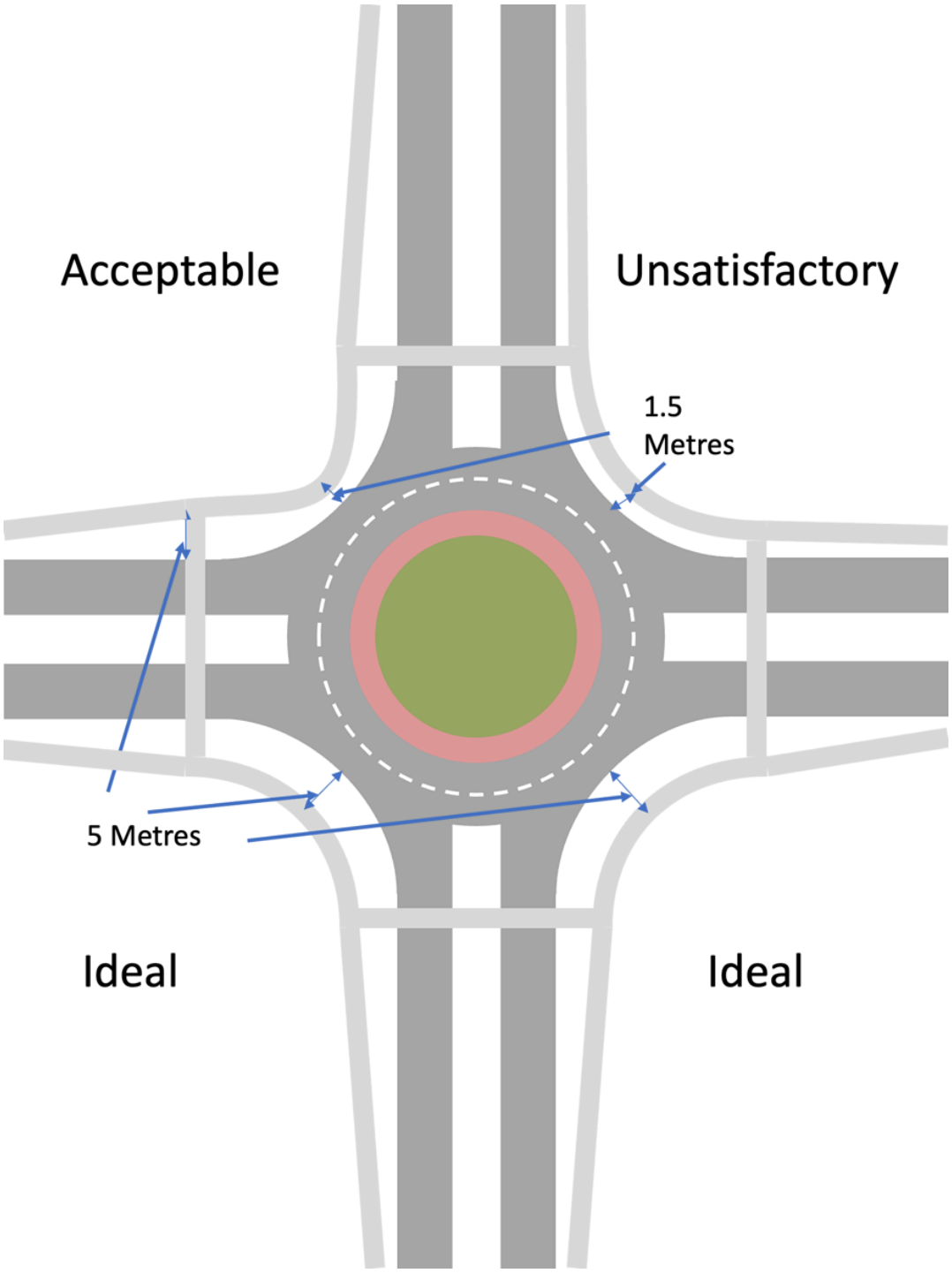
13. We don't think it is possible to "over-educate" on the topic of roundabout safety - for drivers, pedestrians and cyclists. Sadly, dangerous mistakes are made by all three user types on a regular basis. Better design is most important - but more education through the website, social media, schools, and special events would also improve safety. This will be particularly important if/when crossrides are added to the standard designs.

Tangential Roundabout Design



A typical “tangential design” roundabout in the Region. When entering, the road begins to curve well before arriving at the roundabout circle, allowing a more gentle entry curve. A car going straight through the roundabout then goes a quarter of the way around the circle, and then exits on a tangent to the circle (almost a straight line). This design allows faster entry and much faster exit speeds. Note also the cycling facility is only about 1.5 metres from the roundabout roadway, giving no time for drivers and cyclists to see each other after the cyclist turns to cross the roadway.

Radial Roundabout Design



A radial roundabout design. The roadway goes straight until just before the roundabout circle, requiring a sharper turn. Cars going

straight through then follow almost half way around the circle, before turning sharply to exit.

The light grey lines are the cycling facilities. The bottom two “corners” of the roundabout illustrate ideal design (5 metre distance from the roundabout roadway everywhere). The top left corner is an acceptable design if less space is available (5 metre distance at the point where the cyclists turn to cross the roadway, but closer to the roundabout in between the turning points). The top right corner is an unsatisfactory design (only 1.5 metres from the roadway at the turning point).