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ROUNDBABOUTS AT INTERSECTIONS OF REGIONAL ROADS

The Transportation and Works Committee recommends the following:

1. **recommendation 1 contained in the following report, June 3, 2008, from the Commissioner of Transportation Services, be adopted; and**
2. **staff give consideration, where applicable, to incorporating roundabouts in future intersection EA studies.**

1. RECOMMENDATION

It is recommended that:

1. This report be received for information.

2. PURPOSE

This report responds to a request for information on modern roundabouts as noted in the minutes of the October 18, 2007 meeting of the Transportation and Works Committee, and to other inquiries about the potential use of roundabouts on Regional roads.

3. BACKGROUND

In recent years, roundabouts (*see Attachment 1*) have started to appear in North America, Canada as well as in the Greater Toronto Area (GTA) and York Region at a small number of intersections.

Roundabouts in other Municipalities

Staff has completed preliminary research on the introduction of roundabouts in other municipalities.

In Ontario, the Region of Waterloo appears to be the only jurisdiction to have built roundabouts on Regional arterial roads. Waterloo has built 11 roundabouts on their Regional road system. Motorists in the Region of Waterloo have adapted well to the introduction of roundabouts. Much of this success was based upon the extensive public marketing campaign which centred around the development of a comprehensive website. Based on the positive reaction to roundabouts, the Region of Waterloo is planning to build another 30 roundabouts over the next several years.

The City of Ottawa recently approved the implementation of roundabouts, in principle, and is currently evaluating locations for detailed design. Durham Region is planning to build a roundabout this year at the intersection of Regional Road 8 (Brock Street) and Concession 6. The Ministry of Transportation (MTO) is expected to construct a roundabout this year as well. The City of Ottawa, Durham Region and the Ministry of Transportation are proposing their first phase of roundabouts in areas that are primarily rural, with low pedestrian and cyclist volumes and involve the intersection of two-lane roads.

In York Region, smaller roundabouts exist on some local roads in Towns of Markham, Richmond Hill, Aurora, and the City of Vaughan.

Given the impact to arterial road operations, Regional municipalities such as Waterloo, Durham and Ottawa have undertaken comprehensive education and information programmes prior to opening roundabouts. These programmes have typically included media campaigns that include radio advertisements, newspaper advertisements, media releases, on-site signs and delivery of brochures to households. A website with detailed information that included animation and video was a key component of the campaign and all marketing material referred to the website.

4. ANALYSIS AND OPTIONS

Prior to making a decision to implement roundabouts, each municipality examined the implication of building roundabouts with respect to operational issues, safety and applicability to their environment. It is clear that there are both advantages and disadvantages to the use of roundabouts.

4.1 Advantages of Roundabouts

Proponents of roundabouts cite a number of potential benefits of considering a roundabout at a road intersection. Some of the key benefits are noted as follows.

Reduction in Collisions

Studies have shown that roundabouts generally have fewer collisions, and especially fewer injury collisions, compared to standard intersections. There are three reasons for this; lower vehicle speeds, reduced collision angles and fewer conflict points. As a result of these factors, studies show that overall collisions are reduced by 40% and injury collisions up to 75%.

Also, roundabouts can help to reduce delays at lower volume locations since drivers do not need to wait for traffic signals. This also has the potential to reduce energy consumption and act as a traffic calming feature.

Accommodate Unusual Geometric Conditions

Roundabouts are more flexible in terms of dealing with unusual geometric conditions at an intersection. Roundabouts have greater flexibility to accommodate skewed roads, offset roads or the intersection of more than two roads.

Landscaping Opportunities and Potential Gateways

In a roundabout, there is ample space available for landscaping in the middle of the intersection. It is highly visible to all motorists and provides an opportunity to act as a gateway feature for a community. It can also be highly effective at notifying motorists of a change in community context (i.e. transition from a rural highway to a heritage area, residential hamlet, or urban community).

4.2 Disadvantages with Roundabouts

The design and operation of a roundabout are very different from a standard intersection. These differences present some challenges when roundabouts are first introduced on the road system.

Motorists in the GTA are unfamiliar with Roundabout Operations

Given the limited number of roundabouts in operation, this is an operating condition that most motorists are unfamiliar with. Very little motorist education has been dedicated to familiarizing motorists with the rules for using a roundabout on an Ontario wide basis. Each municipality that has introduced roundabouts has undertaken an extensive public education campaign in their community. This is starting to change as The Ministry of Transportation has introduced general information on the use of roundabouts in their 2008 Driver Training Handbook.

Land Requirements

Typically, improvements to a standard intersection are undertaken in a symmetrical fashion around the centre line of both approaches. As a result, the land requirements are easier to ascertain and can generally be predicted based on the planned design. For roundabouts, the design process could involve the shifting of the approach angles of the entry roads or potentially moving the central location of the roundabout itself. These decisions are based on site specific conditions and therefore it is difficult to make a direct comparison of overall land requirements for roundabouts compared to standard intersections.

Although very little additional property is needed on the approaches to a roundabout, when compared to a standard intersection, the roundabout may require more property at the intersection depending on the volume of traffic, level-of-service and accommodation of day-lighting as a result of the different geometric needs of a roundabout. If there is a constrained situation adjacent to an intersection, then providing a roundabout may not be possible.

Cyclists and Pedestrians

Dedicated bicycle lanes are not provided in a roundabout, as this keeps cyclists to the outside circulatory road where they can be cut off by exiting motorists. Cyclists are typically given the choice of either navigating a roundabout as a pedestrian, by allowing them to dismount before entering the roundabout, or to have them take the lane and navigate the roundabout as a motorist.

Pedestrian crossings for roundabouts are located on the approaches to the roundabout, a distance away from the circulatory road. For this reason, pedestrians have a less direct route to their destination and must travel further when walking around a roundabout.

Limited multi-lane roundabouts in Ontario

With the exception of the Region of Waterloo, there are few examples of multi-lane, high volume, urban, arterial road roundabouts in Ontario. Other municipalities that are considering roundabouts are doing so in more rural settings where there are fewer issues related to property constraints, pedestrians and cyclists. Therefore, at this time, there is limited operating experience related to urban, multi-lane roundabouts on arterial roads in Ontario.

4.3 Summary

Roundabouts are still an emerging concept in Ontario and the GTA. The vast majority of motorists and pedestrians are accustomed to a standard intersection. There is limited general knowledge on the use of roundabouts for the average user. While the Region of Waterloo has taken the lead in roundabout construction, many other municipalities continue to take a more cautious approach by considering limited pilot projects.

While there appear to be both advantages and disadvantages to roundabouts, in general, every intersection is unique in its characteristics and constraints and the use of roundabouts should really be subject to case-specific evaluation. The Environmental Assessment (EA) process is the most appropriate mechanism to fully evaluate and compare the benefits and impacts of alternative design solutions. In this regard, as Class EA studies for intersection projects are undertaken, it is recommended that roundabouts be considered as one of the potential solutions. This will provide for a more detailed investigation of this option in the context of all the variables that must be considered for the specific intersection be studied. If, after evaluating the options, a roundabout is determined as the preferred solution, staff will report back to Council with information to support recommendations for the implementation of a roundabout at that specific location prior to moving forward. At that time it may also be appropriate to determine whether policy changes are warranted to address the implementation of roundabouts on Regional roads.

5. FINANCIAL IMPLICATIONS

There are no financial impacts associated with this information report.

6. LOCAL MUNICIPAL IMPACT

As EA studies are undertaken, municipalities are consulted. If, based on the EA evaluation, there is serious consideration of a roundabout, then extensive consultation with the local municipality will be undertaken before finalizing the technically preferred solution.

7. CONCLUSION

Roundabouts are emerging as a potential alternative solution for accommodating intersections. There are both advantages and disadvantages associated with roundabouts.

The City of Ottawa, the Region of Durham and the Ministry of Ontario are proposing to construct roundabouts next year as they continue to test this concept in Ontario. This will provide a good opportunity for Regional staff to monitor progress, document construction methods and gain further knowledge on roundabouts. Future EA studies for intersections should consider roundabouts as a potential solution. If it is the preferred solution, staff will report back to inform Regional Council of the recommended location and required process for implementation.

For more information on this report, please contact Paul Jankowski, General Manager – Roads Branch Extension, at Ext. 5901

The Senior Management Group has reviewed this report.

(The attachment referred to in this clause was included in the agenda for the June 11, 2008 Committee meeting.)