

Clause 6 in Report No. 10 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on June 29, 2018.

6

Performance Review of Roundabouts on Regional Roads

Committee of the Whole recommends adoption of the following recommendation contained in the report dated May 25, 2018 from the Commissioner of Transportation Services:

1. Council receive this report for information.
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Report dated May 25, 2018 from the Commissioner of Transportation Services now follows:

1. Recommendations

It is recommended that Council receive this report for information.

2. Purpose

This report provides Council with information on the performance of roundabouts on Regional roads.

3. Background and Previous Council Direction

Council directed staff to consider roundabouts when undertaking environmental assessment studies for intersection improvements

In [June 2008](#), Council endorsed a report recommending staff give consideration, where applicable, to incorporating roundabouts in future intersection improvement projects.

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Three roundabouts have been installed on Regional roads to address mobility needs

The first Regional roundabout was installed in fall 2013 at the intersection of York/Durham Line and Durham Regional Road 5 in the City of Markham (Figure 1). Prior to installation of the roundabout, the junction of York/Durham Line and Durham Regional Road 5 was irregular in configuration, consisting of a T-intersection with a ramp that facilitated traffic movement to and from the north on the York/Durham Line and to and from the east on Durham Regional Road 5 (Figure 2).

Figure 1
York/Durham Line and Durham Regional Road 5
Roundabout Configuration



Figure 2
York/Durham Line and Durham Regional Road 5
Original Configuration



In summer 2016, a roundabout was installed at the intersection of Ninth Line and Bayberry Street, as part of a development site plan application in the Town of Whitchurch-Stouffville (Figure 3). A roundabout was selected to address traffic growth generated by the new subdivision and to serve as a gateway feature notifying motorists they are entering the community core of the Town of Whitchurch-Stouffville.

Figure 3
Ninth Line and Bayberry Street



The most recent roundabout was installed in fall 2016 at the intersection of Lloydtown-Aurora Road and Keele Street in the Township of King (Figure 4). The intersection satisfied the Region's Traffic and Pedestrian Signal Policy for installation of traffic control signals to address operational needs associated with traffic volumes and vehicle delay. Based on the technical review of alternative intersection treatments, installing a roundabout was deemed the preferred form of intersection control.

Figure 4
Lloydtown-Aurora Road and Keele Street



4. Analysis and Implications

Roundabouts on Regional roads are performing well with less delay and collisions

In 2018, staff completed a traffic operation assessment of the three existing roundabouts on Regional roads. Findings identify that motorists are experiencing up to five seconds less delay during critical peak periods and collisions have significantly reduced, particularly at Lloydtown/Aurora Road and Keele Street, from an average of seven collisions per year down to two; a 71 per cent reduction.

In addition to the technical benefits, there is ample space available for landscaping in the middle of roundabouts. They are highly visible to all motorists and provide an opportunity to act as gateway features for communities. Roundabouts can also be highly effective at informing motorists of a change in community context (i.e. transition from a rural highway to a heritage area, residential hamlet or urban community).

Travellers experience less delay at roundabouts compared to other traffic control options

Historical studies show roundabouts can help reduce delays. Yielding at the entry of a roundabout takes less time than waiting for a green light at a signalized intersection or a gap in traffic at a stop sign. For comparative purposes, staff assessed traffic operations at all three intersections using the latest traffic data available under different scenarios including a roundabout control, a traffic signal and the original stop control configuration. Results indicated travellers experience less overall delay at roundabouts compared to other traffic control options, as shown in Table 1.

Table 1
Overall Delay by Traffic Control Type During Critical Peak Period

Locations	Roundabout	Traffic Signal	Stop Control
York/Durham Line and Durham Regional Road 5	11 sec/veh	19 sec/veh	179 sec/veh
Ninth Line and Bayberry Street	5 sec/veh	5 sec/veh	4 sec/veh
Lloydtown-Aurora Road and Keele Street	4 sec/veh	10 sec/veh	12 sec/veh

Collisions have declined after roundabout implementation

Based on industry studies, converting a stop-controlled intersection to a roundabout can reduce overall collisions by 40 per cent and severe collisions by 75 per cent. Table 2 compares the total number of collisions before and after installation of the roundabouts. For the York/Durham Line and Durham Regional Road 5 roundabout, collision records were reviewed for the four-year period before and after installation. For the Ninth Line and Bayberry Street roundabout and the Lloydtown-Aurora Road and Keele Street roundabout, collision records were reviewed for the four-year period before and one-year period following installation. Preliminary findings indicate a total of 32 collisions occurred prior to construction. Since construction of the roundabouts there have been five collisions. Collision statistics reaffirm the benefit of the roundabout geometry in reducing collisions and their severity. No relevant collision patterns have been identified since the roundabouts were installed.

Table 2
Comparison of Collision Statistics

Locations	Before			After		
	Property Damage	Injury	Fatal	Property Damage	Injury	Fatal
York/Durham Line and Durham Regional Road 5	2	1	1	2	1	0
Ninth Line and Bayberry Street ¹	1	0	0	0	0	0
Lloydtown-Aurora Road and Keele Street ¹	19	7	1	1	1	0
Total Collisions	22	8	2	3	2	0

¹Collision data is only available for one year after installation of roundabout, comparing four years before

Travellers are becoming more accustomed to roundabouts in York Region

Roundabouts are still an emerging concept on Regional roads. While there are a number of benefits identified with roundabouts, initially motorists and overall cyclists and pedestrians are often unfamiliar with navigating them. Roundabout designs are evolving to better accommodate all modes of travel.

Continued improvement in public perception of roundabouts relies on motorists, pedestrians and cyclists adjusting to the rules and how to navigate through a roundabout. The [Ministry of Transportation](#) and [the Region](#) have information available on roundabout rules and use.

Roundabouts are becoming increasingly popular and two more are being constructed in York Region

Many municipalities and the Ministry of Transportation of Ontario have implemented roundabouts across the province. Two roundabouts are being constructed in the Region by other jurisdictions:

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- Bloomington Road and Highway 48, under the jurisdiction of the Ministry of Transportation of Ontario, is expected to begin construction this year with completion in 2019
- Lake Ridge Road and Pefferlaw Road, under the jurisdiction of Durham Region, is a boundary intersection between York and Durham Regions. Durham Region will be constructing the roundabout and estimates completion in 2019

Intersections will continue to be evaluated for implementation of roundabouts

With observed safety benefits, overall improved performance and positive public perception of the Region's first three roundabouts, Transportation Services will continue to consider roundabouts when reviewing intersection improvement opportunities. Under specific circumstances, roundabouts are proven to be the right solution due to their benefits over other traffic controls.

Staff will continue to monitor performance as more roundabouts are constructed, use of existing roundabouts increases over time and more data is available.

5. Financial Considerations

There are no financial impacts associated with this report.

Roundabouts offer benefits at a significant cost for traffic control

Total capital project costs to implement a roundabout, including property acquisitions, utility relocation and construction, can be in excess of five times the cost of a typical four-approach intersection improvement project.

Although initial costs to construct a roundabout are much higher than a traffic signal, in the long term, a roundabout can be more cost-effective by eliminating traffic signal operating costs, reducing societal costs from lower collision rates, lowering collision severity and improving efficiency of the intersection.

6. Local Municipal Impact

Roundabouts are becoming more prevalent and are used in local municipalities. Staff of the local municipalities that have roundabouts on Regional roads are satisfied with their performance and support the Region's position to continue considering roundabouts when reviewing intersection improvement opportunities.

7. Conclusion

Initial performance of the Region's roundabouts is promising. Travellers experience less delay at roundabouts compared to other traffic control options and collisions and collision severity have reduced. Transportation Services will continue to consider roundabouts when reviewing intersection improvement opportunities given their benefits over other traffic controls under specific circumstances.

For more information on this report, please contact Joseph Petrunaro, Director Roads and Traffic Operations, at 1-877-464-9675 ext. 75220.

The Senior Management Group has reviewed this report.

May 25, 2018

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