

TRAFFIC CIRCLE

SUPPLEMENTAL RESEARCH REPORT

Purpose:

This report is supplemental to the Sherwood Broadmoor Traffic Circle report prepared for Council's information in March 2017. The purpose of this supplemental report is to provide information on traffic volume changes and to evaluate any impact the short term improvements may have made to the circle. Crash rates were also compared for the traffic circle and four similar circles in the City of Edmonton.

Traffic Volume Study:

The volume studies are conducted to determine the number of vehicles entering, exiting and circulating around the circle. Traffic data was collected manually by video recording and using pavement counters. The data helps to understand the flow of vehicle, and identifies the density of vehicles approaching the different legs.

There were several studies conducted over the past number of years. Historic traffic count data with number of collision for the particular year are as shown below:

Year	Northbound	Southbound	Westbound	Total Entering Vehicles/day	Number of Collisions
1993	13,050	12,376	8,898	34,324	14
2000	11,546	10,898	8,116	30,560	22
2004	11,546	10,898	12,357	34,801	17
2014	12,787	12,507	7,627	32,921	34
2017	11,564	11,035	7,530	30,129	N/A

Table 1: Historical traffic volumes and collisions

Table 1 shows number of vehicles entering the circle in 1993, 2000, 2004, 2014 and 2017 and the total number of reported collision in the same time period. Traffic volume data collected in 2004, and in 2014 shows that the number of vehicles using the circle is

approximately the same as were in 1993. The approach volumes have varied during different time periods, but overall entering traffic volume remains approximately the same as volumes are captured as a snap shot for an individual day, daily traffic volumes are expected to fluctuate from day to day.

Collision Rate Comparison:

Collision rate comparison was conducted for Sherwood and Broadmoor Traffic Circle, and four similar locations in Edmonton. Collision rates are normally conducted in terms of collisions per million entering vehicles using the following equation;

$$\text{Collision Rate} = \frac{1,000,000 * A}{365 * T * V}$$

Where;

A = total number of reported collisions

T = Time frame for analysis (years)

V = Average Daily Traffic; sum of average daily approach volumes

Traffic volume and collision rate for Edmonton locations were obtained from the City of Edmonton. For collision rate purposes, collisions that occurred from January 1, 2012 to December 31, 2016 are included in the analysis. Traffic volume data collected in 2014 (median year) was used in calculating collision rates.

Location	Entering Volume	2012	2013	2014	2015	2016	Total Crashes	Crash Rate/Million Entering Vehicles
87 Ave/142 St	18,921	10	20	12	18	16	76	2.20
98 Ave/85 St	38,977	29	24	33	41	28	155	2.18
107 Ave/142 St	38,629	57	86	88	101	138	470	6.67
Connors Rd/90 Ave	33,758	38	64	52	35	54	243	3.94
Sherwood/Broadmoor	32,921	26	29	34	38	31	158	2.63

Table 2: Collision rate comparison

From the traffic volume perspective, with the exception of 87 Avenue and 142 Street; Sherwood Drive and Broadmoor Boulevard has similar traffic volumes when compared to the other three locations in Edmonton. The collision rate for the 107 Avenue and 142 Street circle is highest with 6.67 collisions per million entering vehicles while the lowest rate is at the 98 Ave and 85 Street circle with 2.18 collisions per million entering vehicles. Based on similar traffic volumes the collision rate for the 107 Avenue and 142 Street circle are more than double the rate compared with Sherwood/Broadmoor collision rate. The collision rate is also higher for the Connors Road and 90 Avenue circle. The traffic volume and total number of traffic collisions for Sherwood Drive and Broadmoor Boulevard is similar to the 98 Avenue and 85 Street circle and has similar collision rates.

Collision rate was also calculated for Sherwood Drive and Broadmoor Boulevard circle based on the number of collisions in each year.

Year	Traffic Volume (Vehicles/Day)	Total Number of Collisions	Crash Rate/Million Entering Vehicle
1993	34,324	14	1.12
2000	30,560	22	1.97
2004	34,801	17	1.34
2012	33,297*	26	2.14
2013	33,109*	29	2.40
2014	32,921	34	2.83
2015	31,990*	38	3.25
2016	31,060*	31	2.73

*Traffic volume data interpolated

Table 3: Collision rate

From table 3; there is increase in collision rate for the traffic circle even as the number of vehicles entering the intersections remains approximately the same over the past 23 years.

Conclusion:

Traffic volume and collision rate comparison was conducted for the Sherwood Drive and Broadmoor Boulevard Traffic Circle to define changes in volumes and collision rates over several years for the circle and to compare to similar traffic circle locations in Edmonton. Traffic volumes collected at the traffic circle during different time periods suggests that there is little to no impact on overall traffic volumes and the number of vehicles using the traffic circle has not varied significantly since 1993. Collision rates for the Sherwood Drive and Broadmoor Boulevard traffic circle are similar to comparable locations in the City of Edmonton. The traffic circle is still the third highest frequency crash rate location based on 2013-2015 collision numbers. As suggested in the March 2017 report, the number of traffic collisions is decreasing since the final modifications were made in May 2016. The recent decrease in collision numbers may be due to improved driver behaviour and awareness and it is recommended to continue to monitor the circle and report back each year to ensure the safety benefits are being realized. There is no indication that major improvements are required to improve capacity at the circle according to accepted levels of service.