

# **Sherwood Drive and Broadmoor Boulevard Traffic Circle Study**

Priorities Committee Meeting  
October 22, 2019

Transportation Planning and Engineering

# Background

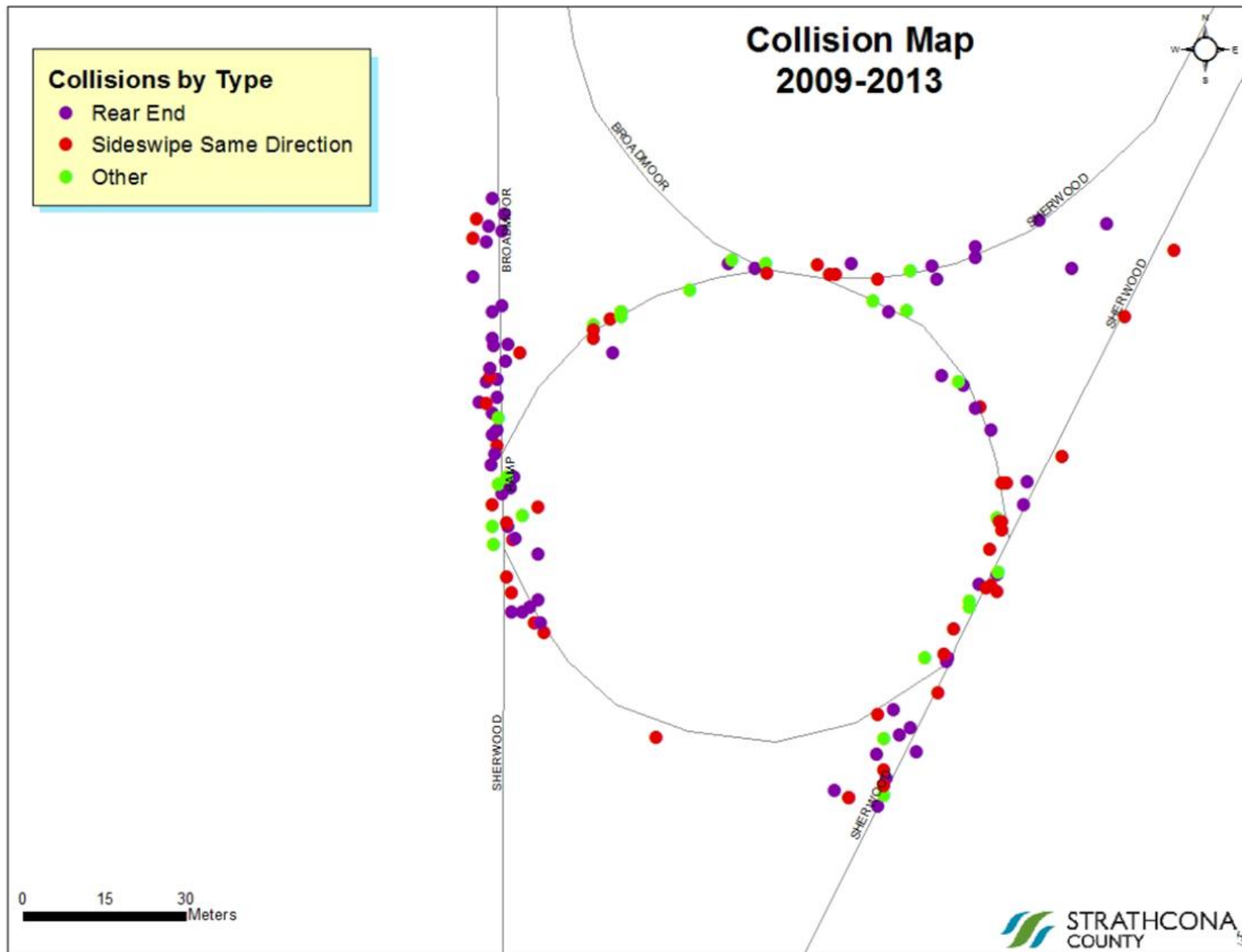
- the existing traffic circle at Broadmoor Boulevard and Sherwood Drive experienced increased collisions up to 2015
- Al-Terra Engineering evaluated traffic operations and investigated alternative intersection treatments
- 15 years from rehabilitation, implement interim safety measures or reconstruct to modern design standards

# Before collisions

- 3<sup>rd</sup> highest collision frequency intersection
- 1<sup>st</sup> highest rate of collisions intersection



# Before collision types and locations



- collision types:
  - angle collisions
    - merging – resulting in angle collisions
    - diverging – resulting in angle collisions
  - rear end collisions
    - at entry and on exit
    - following too close and not yielding
  - sideswipes
    - changing lanes
    - unsafe entry or passing within circle
- driver education on proper lane use and driving rules
- eliminate conflicts by separating movements

# Before traffic operations

- adequate level of service and capacity for traffic volumes
- driver behaviour and perceived right of way
- outside lanes viewed as free-flow through lanes
- drivers entering circle not yielding to circulating traffic
- duty of care to address increasing collisions in 2015
- antiquated design should be altered or reconstructed to modern standards

# Before operational assessment

- Al-Terra Engineering review and assessment
- collaborative internal stakeholder
- public engagement and survey with 2,263 responses
- identify operational issues or constraints
- develop the criteria for intersection alternative evaluation matrix
- evaluation criteria assigned
  - safety
  - traffic operations
  - public realm (landscaping, pedestrian connectivity)
  - operational impact / benefits and sustainability
  - maintenance, utilities and overland drainage

# Before operational assessment

- strong public support to keep the intersection as a circle or roundabout
- 10 to 15 years remaining in service life cycle of roadway
- interim safety improvement option implemented in 2016
- Council requested three year study and evaluation of interim option
- review and compare collisions before and after
- review interim outcomes with the TSAC for Council consideration

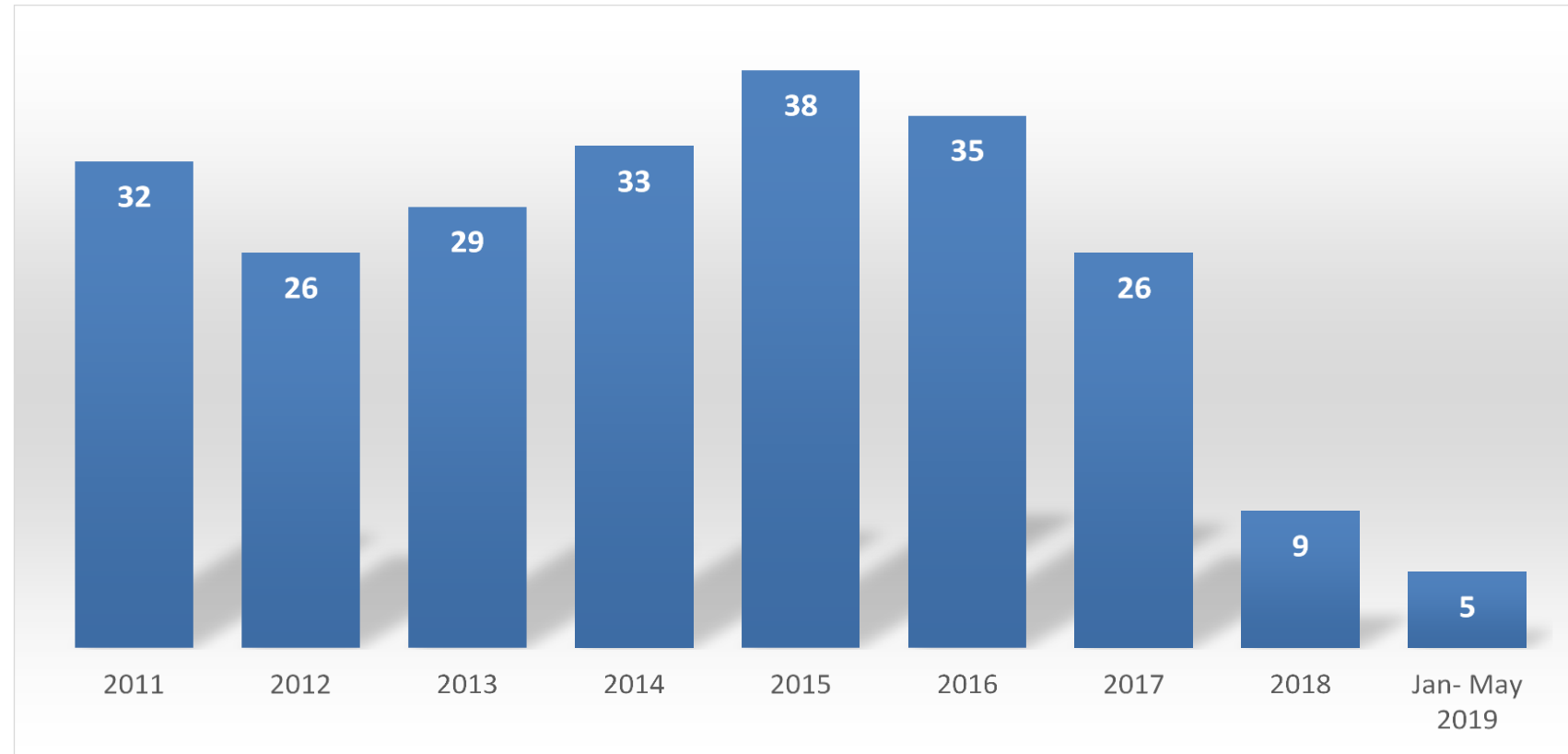
# Collisions comparison

	before (June 2013- May 2016)	after (June 2016 – May 2019)	% change
total	105	55	-47.6
major injury	1	0	-100.00
minor injury	34	20	-41.2
property damage only	70	35	-50.00

- overall 48% reduction in collisions in the three year evaluation period
- no major injury collisions and 41.2% reduction in minor injury collisions



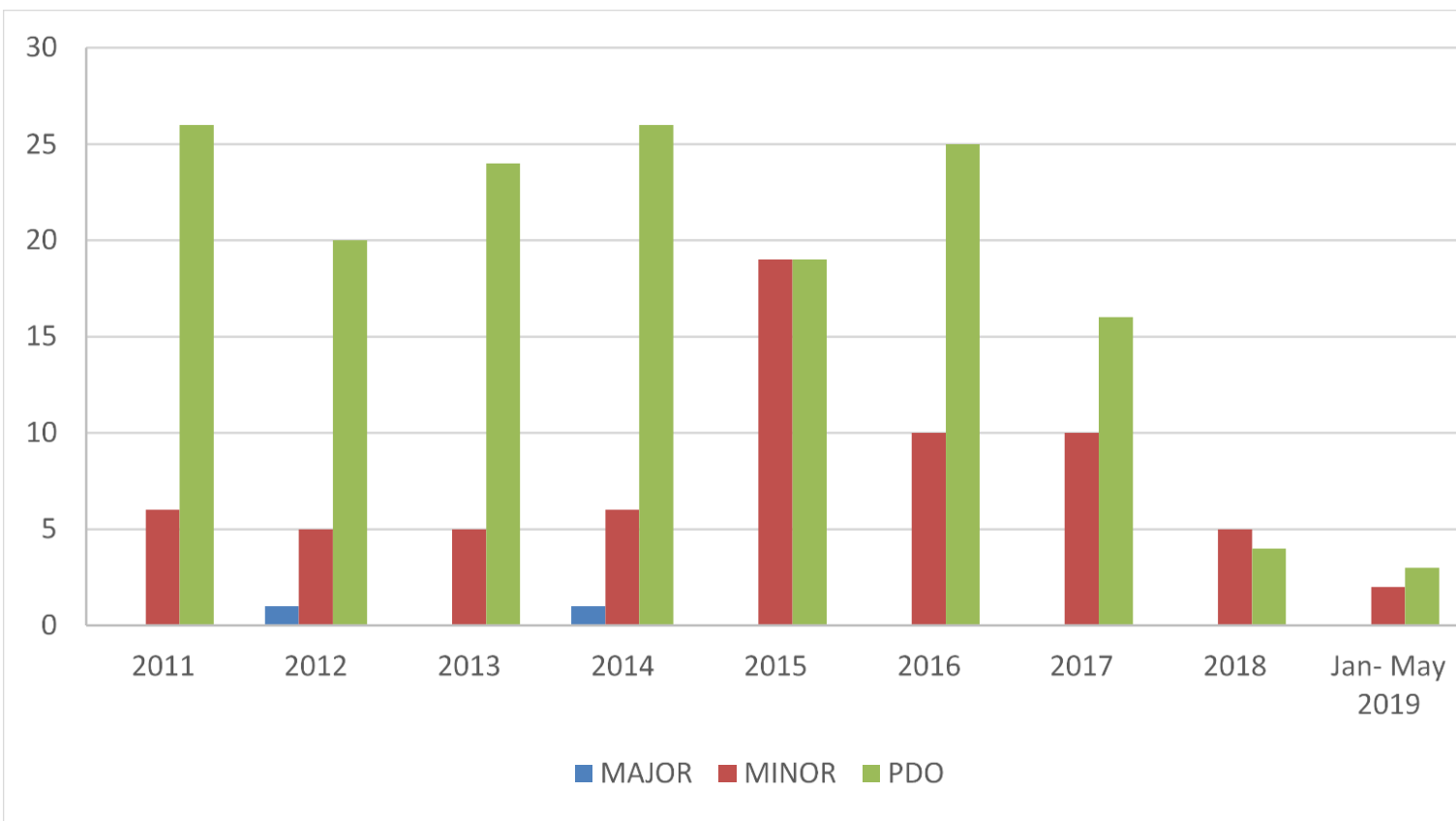
# Collisions – annual



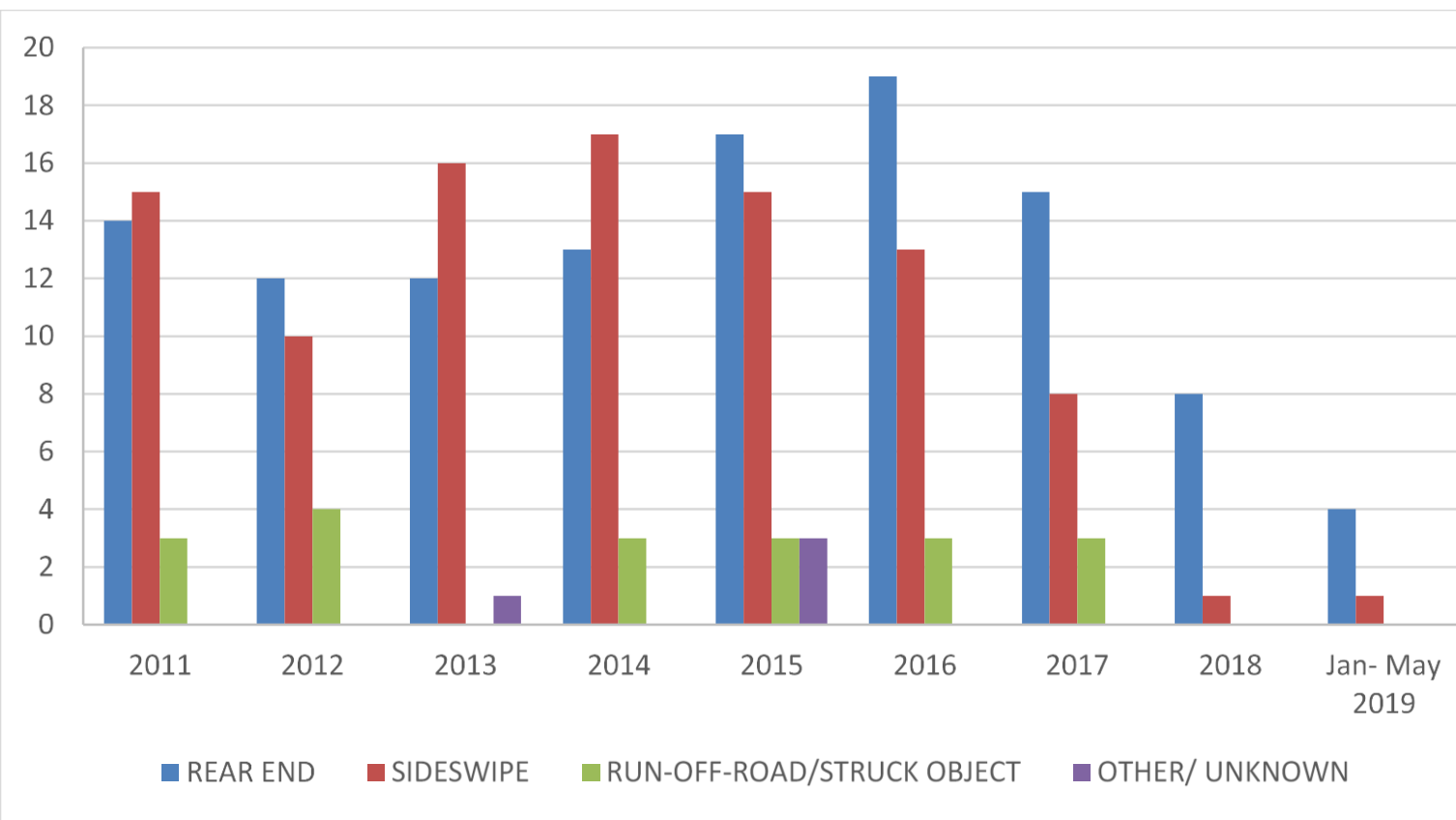
**Graph 1: Total Collisions per Year**

- annual collisions reducing every year
- trending downward – 2017 was a generally high collision year
- 2018 was a generally lower collision year with 76% reduction over 2015

# Collisions

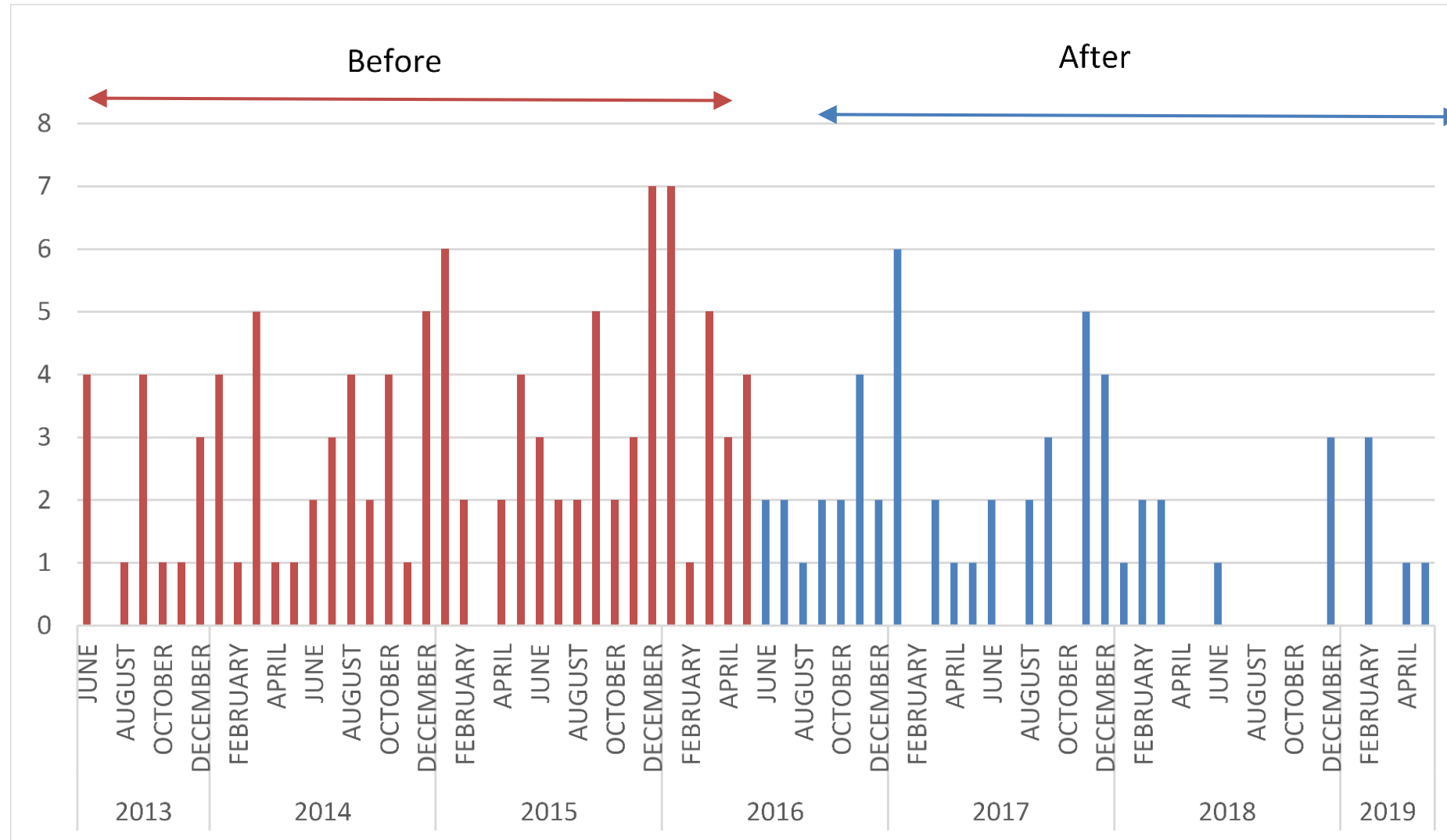


**Graph 2: Collision by Severity**



**Graph 3: Collision by Type**

# Collisions



### Graph 5: Collision Frequency by Month

# Collisions

Year	NB	SB	WB	Veh/Day	Collisions	Collision Rate/ Million Vehicles
1993	13,050	12,376	8,898	34,324	14	1.12
2000	11,546	10,898	8,116	30,560	22	1.97
2013	11,546	10,898	12,357	34,801	29	2.28
2014	12,787	12,507	7,627	32,921	33	2.28
2015	11,567	10,985	6,858	29,410	38	3.54
2016	11,565	11,010	7,194	29,769	35	3.22
2017	11,564	11,035	7,530	30,129	26	2.36
2018	11,953	10,529	6,765	29,247	9	0.84
2019	12,342	10,024	6,001	28,367	5*	1.17

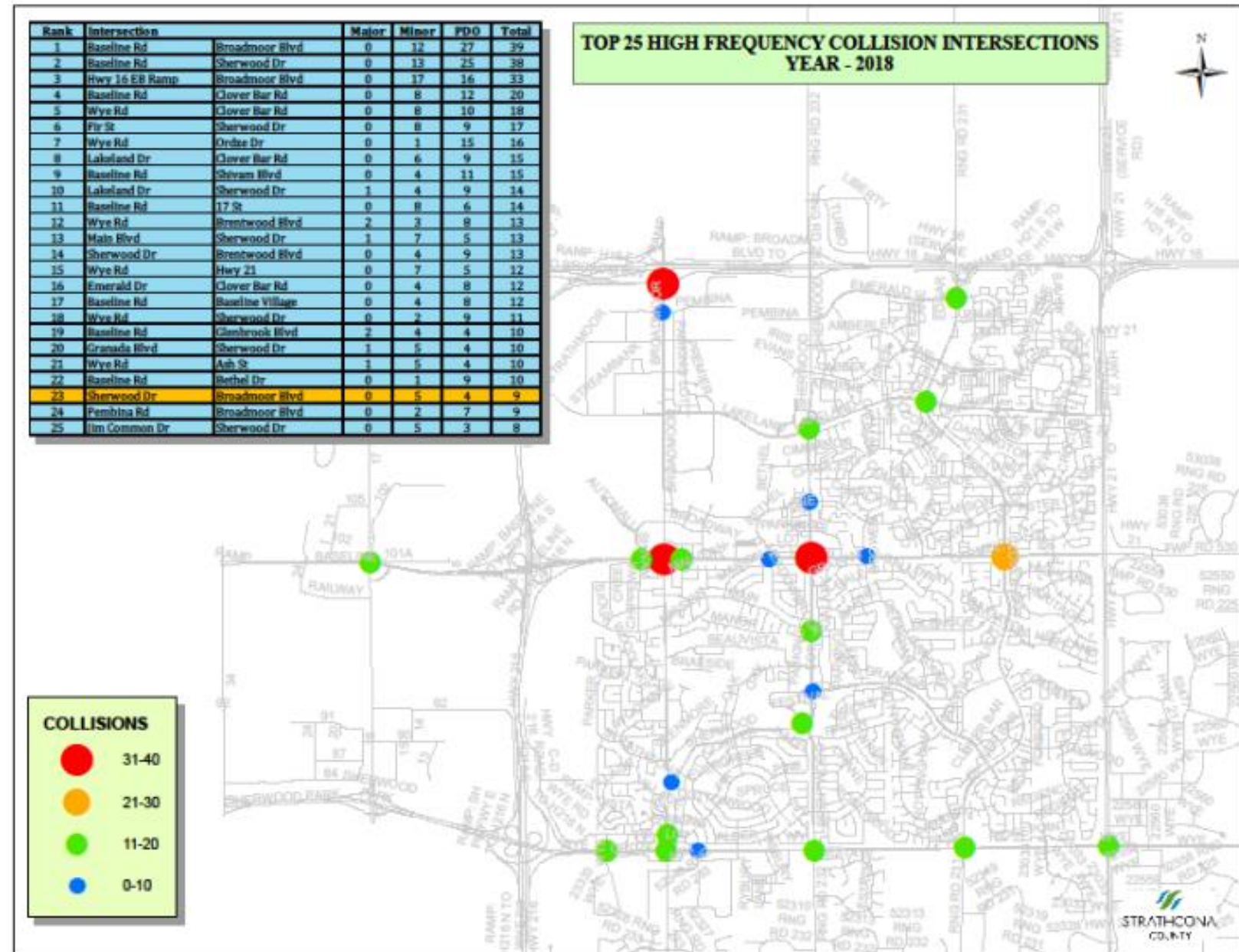
\*January – May 2019

**Table 2: collision rates by year**

# After collisions

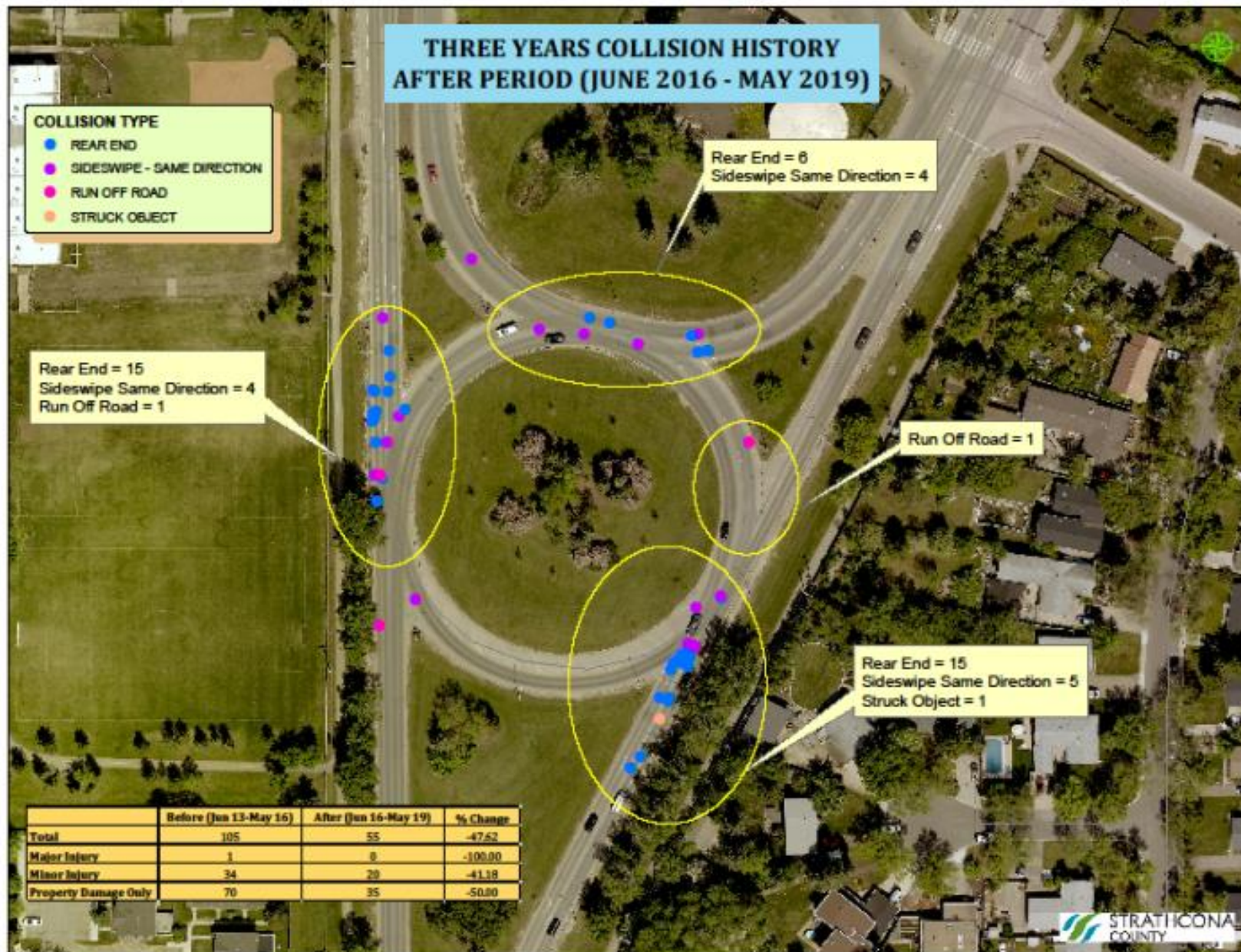
- 23<sup>rd</sup> highest collision frequency intersection from 3<sup>rd</sup>
- 20<sup>th</sup> highest rate of collisions intersection from 1<sup>st</sup>

Rank	Intersection		Major	Minor	PDO	Total	Traffic Volume	Rate/Million
1	Hwy 16 EB Ramp	Broadmoor Blvd	0	17	16	33	20,300	4.45
2	Baseline Rd	Broadmoor Blvd	0	12	27	39	66,200	1.61
3	Baseline Rd	Sherwood Dr	0	13	25	38	64,600	1.61
4	Wye Rd	Clover Bar Rd	0	8	10	18	31,500	1.57
5	Wye Rd	Hwy 21	0	7	5	12	23,900	1.38
6	Emerald Dr	Clover Bar Rd	0	4	8	12	24,900	1.32
7	Lakeland Dr	Clover Bar Rd	0	6	9	15	31,200	1.32
8	Jim Common Dr	Sherwood Dr	0	5	3	8	17,100	1.28
9	Fir St	Sherwood Dr	0	8	9	17	37,400	1.25
10	Sherwood Dr	Brentwood Blvd	0	4	9	13	29,200	1.22
11	Baseline Rd	Clover Bar Rd	0	8	12	20	47,200	1.16
12	Wye Rd	Ordze Dr	0	1	15	16	41,400	1.06
13	Lakeland Dr	Sherwood Dr	1	4	9	14	36,600	1.05
14	Baseline Rd	Shivam Blvd	0	4	11	15	40,400	1.02
15	Baseline Rd	Baseline Village	0	4	8	12	35,000	0.94
16	Main Blvd	Sherwood Dr	1	7	5	13	38,200	0.93
17	Baseline Rd	17 St	0	8	6	14	43,300	0.89
18	Wye Rd	Brentwood Blvd	2	3	8	13	40,400	0.88
19	Granada Blvd	Sherwood Dr	1	5	4	10	31,400	0.87
20	Sherwood Dr	Broadmoor Blvd	0	5	4	9	29,250	0.84
21	Wye Rd	Ash St	1	5	4	10	33,300	0.82
22	Baseline Rd	Glenbrook Blvd	2	4	4	10	33,700	0.81
23	Pembina Rd	Broadmoor Blvd	0	2	7	9	32,350	0.76
24	Baseline Rd	Bethel Dr	0	1	9	10	41,200	0.66
25	Wye Rd	Sherwood Dr	0	2	9	11	50,300	0.6





# After collisions types and locations



- outside circle
- measurable reduction in severity
- fewer angle and sideswipe collisions
- rear end collisions
  - following too close
  - failing to yield

# Video predictive modeling

- eight safety metrics recorded
  - six improved (some dramatically)
  - one stayed the same
  - one got worse (by about 33%)
- overall operational and geometric improvements
- reduced conflict potential and improved safety

# Public feedback

No.	feedback	number
1	positive feedback	6
2	negative feedback	66
	total	72

- initially modifications at the traffic circle
- very few complaints in last two years



# Conclusions

- overall 48% reduction in collisions in the three year evaluation period
- approximately 76% reduction in annual crashes between 2015 and 2018
- no major injuries and 41.2% overall reduction in minor injury collisions
- operational efficiency and level of service remain acceptable
- lifecycle rehabilitation of the road is anticipated in six to ten years
- “The Strathcona County Traffic Safety Advisory Committee recommends to Council the traffic circle be considered for redesign and reconstruction upon regular rehabilitation of the road as deemed necessary by Strathcona County with a proper review of cost/benefit analysis”.

# Recommendations

- maintain current interim traffic control strategy as per the Al-Terra design
- redesign and reconstruct the traffic circle to a modern roundabout when rehabilitation is required in six to ten years
- plan and budget for the long-term reconstruction of the intersection

# Questions?

