COMMITTEE OF THE WHOLE - JUNE 20, 2005

COLLISIONS AT SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

Recommendation

The Commissioner of Engineering and Public Works recommends:

- 1. That the following report be received for information;
- 2. That York Region Police be requested to provide more frequent surveillance and enforcement of the speed limit and ensure better compliance with the existing all-way stop controls at the following intersections until such time that traffic signals are installed in the Fall 2005:
 - Edgeley Boulevard/Portage Parkway (formerly Applewood Crescent-south)
 - Edgeley Boulevard/Applemill Road; and
- 3. That a copy of this report be forwarded to Transportation & Works Department at the Regional Municipality of York for their information.

Economic Impact

Not applicable.

<u>Purpose</u>

This collision summary, the sixth in an annual series, represents a comprehensive review of collision rates at the City's signalized and major unsignalized intersections.

Background - Analysis and Options

Collision Reporting

Collision data were collected and/or updated at the City's 54 signalized intersections and 26 unsignalized intersections selected by staff throughout the City. The data were based on the collision reports received from York Region Police and do not include unreported collisions. A vehicle collision is reportable when any of the following conditions apply:

- Property damage is reported;
- The collision resulted in a personal injury;
- Charges are laid as a result of the collision; or
- A government vehicle is involved.

It must be recognized that collision reports are generally prepared to document the incident, to assign fault and to identify driver error as opposed to documenting collision factors such as geometric design, traffic control operations, roadside environment or driver behaviour.

Collision Rate Determination

Collision rates are considered a better measure of collision risk than the absolute number of collisions at an intersection. A collision rate takes into account the volume of traffic that travels through an intersection each day. For example, 5 collisions in a year at an intersection with 2,000 cars entering it each day is generally more notable than the same number of collisions occurring at an intersection with 15,000 cars entering it each day. Collision rates at intersections are

measured in "collisions per million vehicles entering" (collisions/mve), or the average number of collisions for every one million vehicles that pass through the intersection.

Collision rate = $\frac{\text{number of collisions/year x 1,000,000}}{24 \text{ hour entering volume x 365 days}}$

The 24 hour traffic volume entering an intersection was determined from 8 hour turning movement counts conducted by staff. The daily traffic volume was estimated by doubling the 8 hour counts, since the 24 hour volume is typically twice the volume in the peak 8 hours of the day.

An intersection is generally considered 'critical' when the collision rate exceeds 1.5 collisions/mve, or where a fatal collision has occurred in the past year. Most jurisdictions use these criteria as a "trigger" for further review.

Collisions at Signalized Intersections

Collisions were reviewed at the City's 54 signalized intersections, listed as follows and illustrated on Attachment No. 1:

Aberdeen Avenue/Chancellor Drive Aberdeen Avenue/Embassy Drive Ansley Grove Road/Chancellor Drive Ansley Grove Road/Belview Avenue/Aberdeen Avenue Ansley Grove Road/Embassy Drive/Blue Willow Drive Ansley Grove Road/Windflower Gate/Pinedale Crescent Atkinson Avenue/Arnold Avenue Atkinson Avenue/Campbell Avenue/Manor Gate Atkinson Avenue/Rosedale Heights Drive (North) Atkinson Avenue/Rosedale Heights/Edmund Seager Drive Atkinson Avenue/Spring Gate Boulevard Centre Street/Atkinson Avenue Clark Avenue/Atkinson Avenue Clark Avenue/Brownridge Drive/Joseph Aaron Boulevard Clark Avenue/Charles Street Clark Avenue/Condo Corporation (West of Yonge Street) Clark Avenue/Coulters Mill Plaza (East) Clark Avenue/Dufferin-Clark C.C. Access/Plaza Access Clark Avenue/Hilda Avenue Clark Avenue/Judith Avenue/Stonemill Gate Clark Avenue/New Westminster Drive Clark Avenue/South Promenade Clark Avenue/York Hill Boulevard (West) Clark Avenue/York Hill Boulevard/Springfield Way Creditstone Road/Langstaff Road Chrislea Road/Jevlan Drive Edgeley Boulevard/Applewood Crescent (North) Hilda Avenue/Crestwood Road Hilda Avenue/York Hill Boulevard Kipling Avenue/Woodbridge Avenue Langstaff Road/Vaughan Mills Road Martin Grove Road/Andrew Park/Auburn Road Martin Grove Road/Langstaff Road Martin Grove Road/Roysun Road Martin Grove Road/Woodbridge Avenue Martin Grove Road/Woodstream Blvd/Regina Road

McNaughton Road/Cranston Park Drive McNaughton Road/St. Joan of Arc Avenue Melville Avenue/Avro Road Melville Avenue/Springside Road Millway Avenue/Applewood Crescent (North) Millway Avenue/Pennsylvania Avenue New Westminster Drive/Beverly Glen Boulevard New Westminster Drive/Brownridge Drive/W. Promenade New Westminster Drive/Conley Street New Westminster Drive/Mullen Drive/Joseph Aaron Blvd. Rivermede Road/Bowes Road Rivermede Road/North Rivermede Road Rowntree Dairy Road/Strada Drive Rowntree Dairy Road/Winges Road/Auto Park Circle Whitmore Road/Winges Road/Trowers Road Woodbridge Avenue/Clarence Street Woodbridge Avenue/Forest Drive/Lewis Drive York Hill Boulevard/Chabad Gate

Attachment No. 2 includes a three-year summary of collisions at the City's signalized intersections. None of the locations experienced a collision rate higher than 0.80 collisions/mve.

The four signalized intersections under review last year (Ansley Grove Road/Embassy Drive/Blue Willow Drive, Millway Avenue/Applewood Crescent (north), New Westminster Drive/Conley Street, and Kipling Avenue/Woodbridge Avenue) experienced significantly lower collision rates in 2004 than in 2003 as shown below:

	2003 Collision Rate	2004 Collision Rate
Ansley Grove Road/Embassy/Blue Willow Drive	1.93	0.61
Millway Avenue/Applewood Crescent (north)	1.54	0.31
New Westminster Drive/Conley Street	1.12	0.11
Kipling Avenue/Woodbridge Avenue	1.03	0.13

Collisions at Unsignalized Intersections

Collisions were also reviewed at the following 26 major unsignalized intersections, as illustrated in Attachment No. 3:

Beverley Glen Boulevard/Worth Boulevard Confederation Parkway/Staffern Drive Cranston Park Avenue/Cunningham Drive Creditstone Road/Doughton Road Creditstone Road/MacIntosh Boulevard Creditstone Road/Pippin Road Doughton Road/Maplecrete Road Edgeley Boulevard/Applemill Road Edgeley Boulevard/Portage Parkway (formerly Applewood Crescent-south) Edgelev Boulevard/Cidermill Avenue Edgeley Boulevard/Pennsylvania Avenue Fossil Hill Road/La Rocca Avenue Hilda Avenue/Pinewood Drive Islington Avenue/Nashville Road Jevlan Drive/Carlauren Road Jevlan Drive/Roytec Road Martin Grove Road/Forest Drive Marycroft Avenue/Strada Drive

Melville Avenue/Cunningham Drive Melville Avenue/Hawker Road Millway Avenue/Applewood Crescent (South) Millway Avenue/Cidermill Avenue Napa Valley Avenue/Forest Fountain Drive Sonoma Boulevard/Forest Fountain Drive Sonoma Boulevard/Monte Carlo Drive Thornhill Woods Drive/Summeridge Drive

Attachment No. 4 includes a three-year summary of collisions at the City's unsignalized intersections. A summary of collision rates at two of these intersections between January 1 and December 31, 2004, in descending order of collision rate is provided below.

Intersection

2004 Collision Rate

Edgeley Boulevard/Portage Parkway (formerly Applewood Crescent-south)	1.61
Edgeley Boulevard/Applemill Road	1.01

These locations experienced the highest collisions rates among the City's unsignalized intersections during 2004. Staff examined the collision reports in order to identify any trends in the type of collision, road condition, time of day, vehicle type, driver action and pedestrian/cyclist involvement.

Edgeley Boulevard/Portage Parkway (formerly Applewood Crescent – south)

The unsignalized Edgeley Boulevard/Portage Parkway (formerly Applewood Crescent–south) also intersection is located within a commercial industrial area in Concord. There were ten collisions reported in 2004, compared to fourteen in 2003, for a collision rate of 1.61 collisions/mve. Of the ten collisions, eight were angle collisions, and two were turning movement collisions. There were a total of nine charges laid by York Region Police – six for failure to stop for a stop sign, and three failures to yield the right-of-way.

This intersection was approved for all-way stop control in February 2005 prior to recommendation for traffic signal installation in the Fall 2005.

Staff has verified that the stop signs are appropriately located and sized for this type of intersection. High speed and disregard for existing traffic control was likely a contributing factor in these collisions. Accordingly, it is recommended that York Region Police be requested to provide more frequent enforcement of the speed limit in the vicinity of the intersection as well as compliance with the all-way stop control until such time the traffic signals are installed in the Fall 2005. Portage Parkway is scheduled to open in Fall 2006 as a continuous primary collector roadway that will connect Weston Road and Jane St. by crossing over Highway 400. Chrislea Road and the south portion of Applewood Crescent will be renamed Portage Parkway.

Edgeley Boulevard/Applemill Road

The unsignalized Edgeley Boulevard/Applemill Road intersection is located within an industrial area in Concord. There were seven collisions reported in 2004, compared to eight in 2003, for a collision rate of 1.01 collisions/mve. Of the seven collisions, three were angle collisions, two were turning movement collisions, and two were rear-end collisions. There were a total of four charges laid by York Regional Police – two for failure to stop for a stop sign, one for failure to yield right-of-way, and one for careless driving.

Traffic signals are scheduled to be installed in the Fall 2005.

Staff has verified that the stop signs are appropriately located and sized for this type of intersection. High speed and disregard for existing traffic control was likely a contributing factor in these collisions. Accordingly, it is recommended that York Region Police be requested to provide more frequent enforcement of the speed limit in the vicinity of the intersection as well as compliance with the all-way stop control.

It should be noted that some of the collision numbers, and the resulting rates, reported on for previous years may have changed as more collision reports for those years are received by the City, and as more recent traffic volume data becomes available. The numbers listed in Attachments No. 2 and 4 reflect the latest data received to date by the Engineering Department.

Relationship to Vaughan Vision 2007

This traffic study is consistent with Vaughan Vision 2007, which seeks to improve community safety through design, prevention, enforcement and education (1.1) through the review of the level of enforcement, compliance and monitoring of regulations relating to public safety (1.1.6).

This report is consistent with the priorities previously set by Council and the necessary resources have been allocated and approved.

Conclusion

Based on the 2004 collision review, none of the City's unsignalized intersections experienced a collision rate higher than 1.5 collisions/mve. This criterion is generally the trigger for further review. The highest collision rate experienced at a signalized intersection was 0.80.

One of the major unsignalized intersections experienced a collision rate higher than 1.5 collisions/mve (Edgeley Boulevard/Portage Parkway (formerly Applewood Crescent–south). In addition, one other major unsignalized intersection experienced a collision rate higher than 1.0 collisions/mve (Edgeley Boulevard/Applemill Road) and was marked for further review.

Edgeley Boulevard/Portage Parkway (formerly Applewood Crescent–south) was approved for allway stop control in February 2005, prior to recommendation for traffic signal installation in the Fall 2005. Edgeley Boulevard/Applemill Road are scheduled for traffic signals in the Fall 2005.

York Region Police should be requested to provide more frequent surveillance and enforcement of the speed limit and ensure better compliance with the existing all-way stop controls in the vicinity of these intersections.

Attachments

- 1. Location Map of Signalized Intersections
- 2. Summary of Collisions at Signalized Intersections
- 3. Location Map of Major Unsignalized Intersections
- 4. Summary of Collisions at Major Unsignalized Intersections

Report prepared by

Mark Ranstoller, Senior Traffic Technologist, ext. 8251 Mike Dokman, Supervisor, Traffic Engineering, ext. 8031 Respectfully submitted,

Bill Robinson, P. Eng. Commissioner of Engineering and Public Works Gary Carroll, P. Eng. Director of Engineering Services

:MR



ATTACHMENT No.2

City of Vaughan

Collision Review 2005 - Signalized Intersections

,,		.	Activation					Collision Rate		
#		BIOCK	Date	AADT	Collisio	ons pe	r Year			mve)
		D 07	F 1 00	40000	2002	2003	2004	2002	2003	2004
1	Aberdeen Avenue/Chancellor Drive	B37	February-02	12300	4	0	2	0.89	0.00	0.45
2	Aberdeen Avenue/Embassy Drive	B37	February-02	7900	0	0	0	0.00	0.00	0.00
3	Ansley Grove Road/Chancellor Drive	B37	February-93	21200	7	3	5	0.90	0.39	0.65
4	Ansley Grove Road/Belview Avenue/Aberdeen Avenue	B37	February-01	13100	2	0	3	0.42	0.00	0.63
5	Ansley Grove Road/Embassy Drive/Blue Willow Drive	B37	August-96	17900	3	10	4	0.46	1.93	0.61
6	Ansley Grove Road/Windflower Gate/Pinedale Crescent	B37	March-95	21500	2	1	3	0.25	0.13	0.38
7	Atkinson Avenue/Arnold Avenue	B1	November-02	18000	2	0	3	0.30	0.00	0.46
8	Atkinson Avenue/Campbell Avenue/Manor Gate	B1	January-01	16200	0	1	4	0.00	0.17	0.68
9	Atkinson Avenue/Rosedale Heights Drive (North)	B2	November-02	16000	1	1	1	0.17	0.17	0.17
10	Atkinson Avenue/Rosedale Heights/Edmund Seager Drive	B2	January-01	14300	1	1	2	0.19	0.19	0.38
11	Atkinson Avenue/Spring Gate Boulevard	B1	August-94	15800	2	1	1	0.35	0.17	0.17
12	Centre Street/Atkinson Avenue	B1	August-86	32400	5	7	1	0.42	0.59	0.08
13	Clark Avenue/Atkinson Avenue	B1	August-86	38500	6	4	3	0.43	0.28	0.21
14	Clark Avenue/Brownridge Drive/Joseph Aaron Boulevard	B8	December-88	23200	3	2	3	0.35	0.24	0.35
15	Clark Avenue/Charles Street	B1	February-96	21900	6	2	1	0.75	0.25	0.13
16	Clark Avenue/Condo Corporation (West of Yonge Street)	B1	August-98	25100	10	5	5	1.09	0.55	0.55
17	/ Clark Avenue/Coulters Mill Plaza (East)	B8	March-92	16300	2	2	2	0.34	0.34	0.34
18	Clark Avenue/D.C.C.C. Access/Plaza Access	B8	November-02	18100	2	1	2	0.30	0.15	0.30
19	Clark Avenue/Hilda Avenue	B1	November-87	31700	3	4	4	0.26	0.35	0.35
20	Clark Avenue/Judith Avenue/Stonemill Gate	B8	April-90	17400	5	2	2	0.79	0.31	0.31
21	Clark Avenue/New Westminster Drive	B8	March-90	37200	7	5	6	0.52	0.37	0.44
22	Clark Avenue/South Promenade	B8	August-86	22700	4	4	1	0.48	0.48	0.12
23	Clark Avenue/York Hill Boulevard (West)	B1	December-88	29900	9	5	4	0.82	0.46	0.37
24	Clark Avenue/York Hill Boulevard/Springfield Way	B1	January-88	22400	6	3	5	0.73	0.37	0.61
25	Creditstone Road/Langstaff Road	B24	December-02	25700	1	2	0	0.11	0.21	0.00
26	Chrislea Road/Jevlan Drive	B30	February-03	12100	0	2	3	0.00	0.45	0.68

27	Edgelov Boulovard/Applowood Croscopt (North)	D3U	Echrupry 01	15100	1	1	Δ	0.73	0 1 9	0.00
21		D30		15100	4	0	0	0.75	0.10	0.00
28		BI	January-96	15600	2	0	3	0.35	0.00	0.53
29	Hilda Avenue/York Hill Boulevard	B1	March-90	24900	0	5	2	0.00	0.55	0.22
30	Kipling Avenue/Woodbridge Avenue	B51	February-83	21200	4	8	1	0.52	1.03	0.13
31	Langstaff Road/Vaughan Mills Road	B52	May-04	10700	0	0	0	0.00	0.00	0.00
32	Martin Grove Road/Andrew Park/Auburn Road	B51	October-97	17100	2	1	1	0.32	0.16	0.16
33	Martin Grove Road/Langstaff Road	B51	January-95	19100	0	0	0	0.00	0.00	0.00
34	Martin Grove Road/Roysun Road	B51	April-91	19800	1	1	1	0.14	0.14	0.14
35	Martin Grove Road/Woodbridge Avenue	B51	April-93	18300	5	2	1	0.75	0.30	0.15
36	Martin Grove Road/Woodstream Blvd/Regina Road	B50	February-02	22400	3	2	2	0.37	0.24	0.24
37	McNaughton Road/Cranston Park Drive	B26	February-99	9200	0	0	0	0.00	0.00	0.00
38	McNaughton Road/St. Joan of Arc Avenue	B26	October-97	10000	0	0	0	0.00	0.00	0.00
39	Melville Avenue/Avro Road	B25	May-04	12200	1	0	3	0.22	0.00	0.67
40	Melville Avenue/Springside Road	B25	May-04	13700	0	2	4	0.00	0.40	0.80
41	Millway Avenue/Applewood Crescent (North)	B30	January-03	8900	1	5	1	0.31	1.54	0.31
42	Millway Avenue/Pennsylvannia Avenue	B30	February-02	8700	1	0	0	0.31	0.00	0.00
43	New Westminster Drive/Beverly Glen Boulevard	B9	February-99	21800	2	2	3	0.25	0.25	0.38
44	New Westminster Drive/Brownridge Drive/W. Promenade	B8	November-93	31000	3	4	1	0.27	0.35	0.09
45	New Westminster Drive/Conley Street	B8	January-88	26000	4	8	1	0.42	1.12	0.11
46	New Westminster Drive/Mullen Drive/Joseph Aaron Blvd.	B8	March-90	24400	3	3	1	0.34	0.34	0.11
47	Rivermede Road/Bowes Road	B16	November-92	15400	1	5	2	0.18	0.89	0.36
48	Rivermede Road/North Rivermede Road	B16	March-94	15400	1	1	4	0.18	0.18	0.71
49	Rowntree Dairy Road/Strada Drive	B36	May-02	18900	3	6	1	0.43	0.87	0.14
50	Rowntree Dairy Road/Winges Road/Auto Park Circle	B36	May-02	23000	2	3	1	0.24	0.36	0.12
51	Whitmore Road/Winges Road/Trowers Road	B36	May-02	16600	2	0	0	0.33	0.00	0.00
52	Woodbridge Avenue/Clarence Street	B44	October-96	18000	4	2	0	0.61	0.30	0.00
53	Woodbridge Avenue/Forest Drive/Lewis Drive	B51	January-03	10100	2	1	0	0.54	0.27	0.00
54	York Hill Boulevard/Chabad Gate	B1	February-02	13000	1	2	0	0.21	0.42	0.00

Notes:

AADT - Annual Average Daily Travel, updated to most recent traffic count data available.

mve - million vehicles entering

Collisions per year may vary as new reports are received by the City



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ATTACHMENT No.4

City of Vaughan

Collision Review 2004 - Major Unsignalized Intersections

#	Intersection Location	Block	All-Way Stop	Surrounding Uses	AADT	Collisions per Year			Collision Rate (collisions/mve)			
						2002	2003	2004	2002	2003	2004	
	1 Beverley Glen Boulevard/Worth Boulevard	B9	No	Residential	7900	0	1	0	0.00	0.35	0.00	
2	2 Confederation Parkway/Staffern Drive	B17	Yes	Industrial	8400	2	1	0	0.65	0.33	0.00	
	3 Cranston Park Avenue/Cunningham Drive	B26	Yes	Residential	5600	1	0	0	0.49	0.00	0.00	
4	4 Creditstone Road/Doughton Road	B22	Yes	Industrial	9200	2	0	0	0.60	0.00	0.00	
į	5 Creditstone Road/MacIntosh Boulevard	B23	No	Industrial	14200	0	0	1	0.00	0.00	0.19	
(6 Creditstone Road/Pippin Road	B23	No	Industrial	12700	0	1	1	0.00	0.22	0.22	
-	7 Doughton Road/Maplecrete Road	B22	Yes	Industrial	6900	2	1	0	0.79	0.40	0.00	
8	8 Edgeley Boulevard/Applemill Road	B30	Yes	Industrial	18900	2	8	7	0.29	1.16	1.01	
9	9 Edgeley Boulevard/Portage Parkway	B30	Yes	Industrial	17000	5	14	10	0.81	2.26	1.61	
1(0 Edgeley Boulevard/Cidermill Avenue	B30	No	Industrial	11400	0	2	0	0.00	0.48	0.00	
1	1 Edgeley Boulevard/Pennsylvania Avenue	B30	Yes	Industrial	14000	2	0	2	0.39	0.00	0.39	
12	2 Fossil Hill Road/La Rocca Avenue	B36	Yes	Residential	7300	1	0	0	0.38	0.00	0.00	
1:	3 Hilda Avenue/Pinewood Drive	B1	Yes	Residential	17600	7	2	0	1.09	0.31	0.00	
14	4 Islington Avenue/Nashville Road	B54	Yes	Kleinburg	10400	0	0	0	0.00	0.00	0.00	
1	5 Jevlan Drive/Carlauren Road	B30	Yes	Industrial	9400	1	1	1	0.29	0.29	0.29	
16	6 Jevlan Drive/Roytec Road	B30	Yes	Industrial	9000	1	0	1	0.30	0.00	0.30	
1	7 Martin Grove Road/Forest Drive	B51	Yes	Residential	11400	0	2	1	0.00	0.48	0.24	
18	8 Marycroft Avenue/Strada Drive	B36	Yes	Industrial	12300	1	2	0	0.22	0.45	0.00	
19	9 Melville Avenue/Cunningham Drive	B26	Yes	Residential	9900	0	0	0	0.00	0.00	0.00	
20	0 Melville Avenue/Hawker Road	B25	No	Residential	15500	0	0	1	0.00	0.00	0.18	
2	1 Millway Avenue/Applewood Crescent (South)	B30	Yes	Industrial	12400	1	1	3	0.22	0.22	0.66	
22	2 Millway Avenue/Cidermill Avenue	B30	Yes	Industrial	7100	0	0	0	0.00	0.00	0.00	
23	3 Napa Valley Avenue/Forest Fountain Drive	B53	Yes	Residential	7400	1	0	1	0.37	0.00	0.37	
24	4 Sonoma Boulevard/Forest Fountain Drive	B53	Yes	Residential	7700	1	0	2	0.36	0.00	0.71	
2	5 Sonoma Boulevard/Monte Carlo Drive	B53	Yes	Residential	4000	1	0	1	0.68	0.00	0.68	
20	6 Thornhill Woods Drive/Summeridge Drive	B10	Yes	Residential	6200	0	0	0	0.00	0.00	0.00	

Notes:

mve - million vehicles entering

"Kleinburg" refers to Kleinburg Village

Collisions per year may vary as reports are received by the City

AADT - Annual Average Daily Travel, updated to most recent traffic count data available.