

COMMITTEE OF THE WHOLE JUNE 18, 2001

COLLISIONS AT SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

Recommendation

The Commissioner of Development Services and Public Works recommends:

1. That the following report be received for information purposes; and
2. That York Region Police be requested to provide more frequent enforcement of the posted speed limit at the following intersections:
 - New Westminster Drive/Conley Street;
 - Ansley Grove Road/Embassy Drive/Blue Willow Drive;
 - Clark Avenue/Condo Corp. (West of Yonge Street); and
 - New Westminster Drive/Mullen Drive/Joseph Aaron Boulevard; and
3. That staff investigate means by which traffic operations can be improved at the Clark Avenue/Condo Corp. intersection west of Yonge Street.

Purpose

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

Background - Analysis and Options

Collision Reporting

Collision data was collected or updated at the City's 36 signalized intersections, plus 26 unsignalized intersections selected by staff within the City. The number of unsignalized intersections reviewed is two less than last year, due to their signalization within the past year. The data was based on and limited to the collision reports received from York Region Police, and does not include unreported collisions. A vehicle collision is reportable when any of the following conditions apply:

- Property damage is in excess of \$1,000.00;
- 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 generally collision reports are prepared to document incident, assign fault and 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. This is primarily due to the fact that 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.

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

The 24 hour traffic volume entering an intersection was determined either by use of automatic traffic recorders (ATRs) or from eight hour turning movement counts conducted by staff. In the latter case the daily traffic volume was estimated by doubling the eight hour counts, since the 24 hour volume is typically twice the volume in the peak eight 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 therefore use these criteria as a “trigger” for further review.

Collisions at Signalized Intersections

Collisions were reviewed at the City’s 36 signalized intersections, listed as follows and illustrated on Attachment #1:

Ansley Grove Road/Embassy Drive/Blue Willow Drive
Ansley Grove Road/Windflower Gate/Pinedale Crescent
Ansley Grove Road/Chancellor 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/Coulters Mill Plaza (East)
Clark Avenue/Judith Avenue/Stonemill Gate
Clark Avenue/Hilda Avenue
Clark Avenue/New Westminster Drive
Clark Avenue/South Promenade
Clark Avenue/York Hill Boulevard (West)
Clark Avenue/York Hill Boulevard (East)/Springfield Way
Hilda Avenue/York Hill Boulevard
Hilda Avenue/Crestwood Road
Martin Grove Road/Royson Road
New Westminster Drive/Brownridge Drive/West Promenade
Martin Grove Road/Woodbridge Avenue
McNaughton Road/St. Joan of Arc Avenue
New Westminster Drive/Conley Street
New Westminster Drive/Mullen Drive/Joseph Aaron Boulevard
Rivermede Road/Bowes Road
North Rivermede Road/Rivermede Road
Woodbridge Avenue/Kipling Avenue
Woodbridge Avenue/Clarence Street
McNaughton Road/Cranston Park Drive
New Westminster Drive/Beverly Glen Boulevard
Atkinson Avenue/Rosedale Heights Drive (North)/Highcliffe Avenue
Clark Avenue/Condo Corp. (West of Yonge Street)
Martin Grove Road/Andrew Park/Auburn Road
Ansley Grove Road/Belview Avenue/Aberdeen Avenue
Atkinson Avenue/Campbell Avenue/Manor Gate
Atkinson Avenue/Rosedale Heights/Edmund Seager Drive
Edgeley Boulevard/Applewood Crescent (North)

Attachment #2 includes a six-year summary of collisions at the City’s 36 signalized intersections.

Provided below is a summary of collision rates at five of the City's signalized intersections between January 1 and December 31, 2000, in descending order of collision rate:

<u>Intersection</u>	<u>2000 Collision Rate</u>
New Westminster Drive/Conley Street	1.48
Ansley Grove Road/Embassy Drive/Blue Willow Drive	1.39
Clark Avenue/Condo Corp. (West of Yonge Street)	1.06
New Westminster Drive/Mullen Drive/Joseph Aaron Boulevard	1.04
Clark Avenue/New Westminster Drive	0.57

The first four locations experienced the highest collisions rates among the City's signalized intersections during 2000, although none were in excess of 1.5 collisions/mve. Staff examined the collision reports to identify any trends in the type of collision, road condition, time of day, vehicle type, driver action and pedestrian/cyclist involvement.

The signalized Clark Avenue/New Westminster Drive intersection, which was examined in detail last year, experienced a collision rate lower than in 1999. As the new rate is well below 1.5 collisions/mve, it is recommended that no further review is required at this time.

New Westminster Drive/Conley Street

The signalized New Westminster Drive/Conley Street intersection is located within a residential area in Thornhill. There were 6 collisions reported in 2000, compared to 2 in 1999, for a collision rate of 1.48 collisions/mve. Three were rear-end collisions. Since the most probable cause of rear-end collisions is speeding, staff will request that York Region Police provide more frequent enforcement of the posted speed limit on New Westminster Drive.

Ansley Grove Road/Embassy Drive/Blue Willow Drive

The signalized Ansley Grove Road/Embassy Drive/Blue Willow Drive intersection is located within a residential area in Woodbridge. There were 6 collisions reported in 2000, compared to 2 in 1999, for a collision rate of 1.39 collisions/mve. Four were angle collisions, where a motorist proceeded through the intersection on a red signal. The signal heads are clearly visible on all of the approaches. Staff will request that York Region Police provide more frequent enforcement of the posted speed limit in the vicinity.

Clark Avenue/Condo Corp. (West of Yonge Street)

The signalized Clark Avenue/Condo Corp. intersection is located in Thornhill, and serves the Skyrise Plaza and law buildings immediately west of Yonge Street. There were 11 collisions reported in 2000, the same number as in 1999, for a collision rate of 1.06 collisions/mve. Eight were rear-end or sideswipe collisions, and all but one of these collisions occurred in inclement weather. It is likely that high speeds on Clark Avenue, the curve on Clark Avenue west of the intersection, and the close proximity of the intersection to Yonge Street were contributing factors. Staff will request that York Region Police provide more frequent enforcement of the posted speed limit in the vicinity.

There are already curve warning and signal ahead signs before the intersection. However, staff will investigate means by which traffic operations can be further improved at this location.

New Westminster Drive/Mullen Drive/Joseph Aaron Boulevard

The signalized New Westminster Drive/Mullen Drive/Joseph Aaron Boulevard intersection is located within a residential area in Thornhill. There were 8 collisions reported in 2000, compared to 3 in 1999, for a collision rate of 1.04 collisions/mve. The collisions were of varying types, with

three occurring in inclement weather. No trends were identified, although high speeds along New Westminster Drive is a possible cause. Staff will request that York Region Police provide more frequent enforcement of the posted speed limit in the vicinity.

Collisions at Unsignalized Intersections

Collisions were also reviewed at the following 26 major unsignalized intersections, as illustrated on Attachment #3:

Martin Grove Road/Woodstream Boulevard/Regina Road
Martin Grove Road/Forest Drive
Hilda Avenue/Pinewood Drive
Aberdeen Avenue/Embassy Drive
Islington Avenue/Nashville Road
Chancellor Drive/Aberdeen Avenue
Millway Avenue/Applewood Crescent (North)
Millway Avenue/Applewood Crescent (South)
Millway Avenue/Cidermill Avenue
Millway Avenue/Pennsylvania Avenue
Edgeley Boulevard/Applewood Crescent (South)
Edgeley Boulevard/Cidermill Avenue
Edgeley Boulevard/Pennsylvania Avenue
Creditstone Road/Pippin Road
Creditstone Road/MacIntosh Road
Creditstone Road/Doughton Road
Doughton Road/Maplecrete Road
Jevlan Drive/Roytec Road
Jevlan Drive/Carlauren Road
Jevlan Drive/Chrislea Road
Whitmore Road/Trowers Road
Rowntree Dairy Road/Winges Road
Rowntree Dairy Road/Strada Drive
Marycroft Avenue/Strada Drive
Beverly Glen Boulevard/Worth Boulevard
Melville Avenue/Cunningham Drive

Attachment #4 includes a four-year summary of collisions at 26 of the City's unsignalized intersections.

Provided below is a summary of selected collision rates at three of the City's major unsignalized intersections between January 1 and December 31, 2000, in descending order of collision rate:

<u>Intersection</u>	<u>2000 Collision Rate</u>
Rowntree Dairy Road/Winges Road/Auto Park Circle	2.67
Chancellor Drive/Aberdeen Avenue	0.49
Edgeley Boulevard/Applewood Crescent (South)	0.22

The Rowntree Dairy Road/Winges Road/Auto Park Circle intersection experienced a high collision rate in 2000, well in excess of 1.5 collisions/mve. Staff examined the collision reports at this location.

The unsignalized Chancellor Drive/Aberdeen Avenue and Edgeley Boulevard/Applewood Crescent (South) intersections both experienced collision rates lower than in 1999. As before, the new collision rates are well below 1.5 collisions/mve, and it is recommended that no further review is required at this time.

Rowntree Dairy Road/Winges Road/Auto Park Circle

The unsignalized Rowntree Dairy Road/Winges Road/Auto Park Circle intersection is located in the Pine Valley Business Park south of Highway 7 and west of Weston Road. There were 8 collisions at the intersection in 2000, compared to 5 in 1999, for a collision rate of 2.67 collisions/mve. Most were angle collisions, where the motorist on the approach subject to stop control proceeded through the intersection out of turn. The stop control on the north and south approaches of the intersection was replaced with allway stop control on August 30, 2000. This intersection is scheduled for signalization this fall.

Conclusion

Based on the collision review, none of the City's signalized intersections are experiencing collision rates higher than 1.5 collisions/mve, a rate that is utilized by a number of jurisdictions as a "trigger" for review. However, the following four signalized intersections are experiencing collision rates above 1.0 collisions/mve:

- New Westminster Drive/Conley Street;
- Ansley Grove Road/Embassy Drive/Blue Willow Drive;
- Clark Avenue/Condo Corp. (West of Yonge Street); and,
- New Westminster Drive/Mullen Drive/Joseph Aaron Boulevard.

Staff will request that York Region Police provide more frequent enforcement of the posted speed limit in the vicinity of these intersections.

Staff will investigate means by which traffic operations can be improved at the Clark/Avenue Condo Corp. intersection west of Yonge Street.

The one unsignalized intersection experiencing a collision rate in excess of 1.5 collisions/mve is at Rowntree Dairy Road/Winges Road/Auto Park Circle. This intersection is scheduled for signalization this fall.

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:

- P. Weber, Traffic Engineer, ext 8264
- B. Holly, Sr. Manager Development/Transportation Engineering, ext 8250

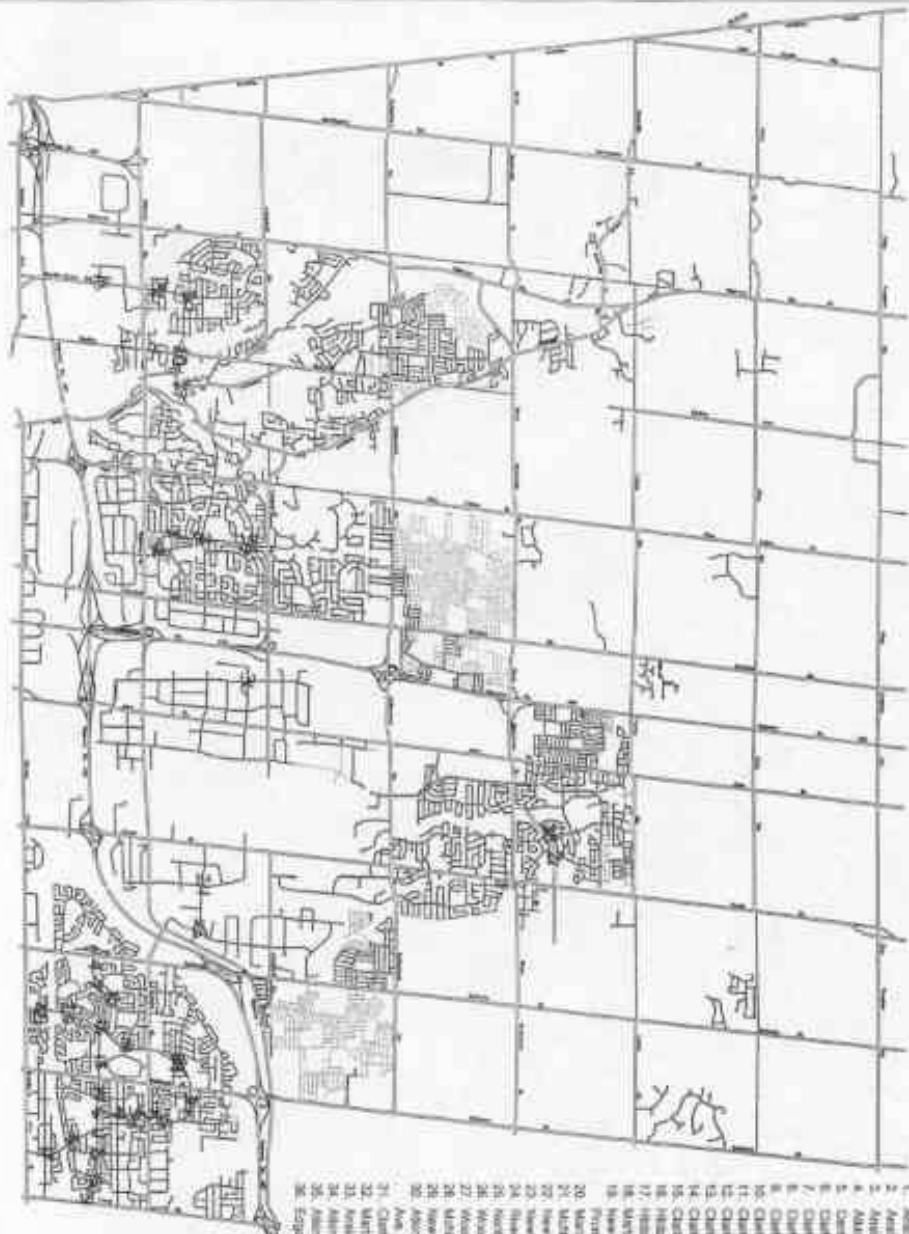
Respectfully submitted,

FRANK MIELE
Commissioner of Development Services
& Public Works

Bill Robinson, P. Eng
Director of Engineering

ATTACHMENT No. 1

City of Vaughan - Collision Review 2001 Signalized Intersections - 2000



Signalized Intersections

1. Avery Road St Eastway Dr, Bina Wilk Dr
2. Avery Road St Westway St/Finchway East
3. Avery Road St/Cherry St
4. Altonway Ave/Spring Dale Blvd
5. Chesley St/McKenney Ave
6. Clark Ave/McKenney Ave
7. Clark Ave/Downings Dr/Conant Lane Blvd
8. Clark Ave/Charles St
9. Clark Ave/Finchway Mill Ponds (east)
10. Clark Ave/South Ave/Finchway East
11. Clark Ave/19th Ave
12. Clark Ave/16th Ave
13. Clark Ave/14th Ave
14. Clark Ave/13th Ave
15. Clark Ave/12th Ave
16. Clark Ave/11th Ave
17. Clark Ave/10th Ave
18. Clark Ave/9th Ave
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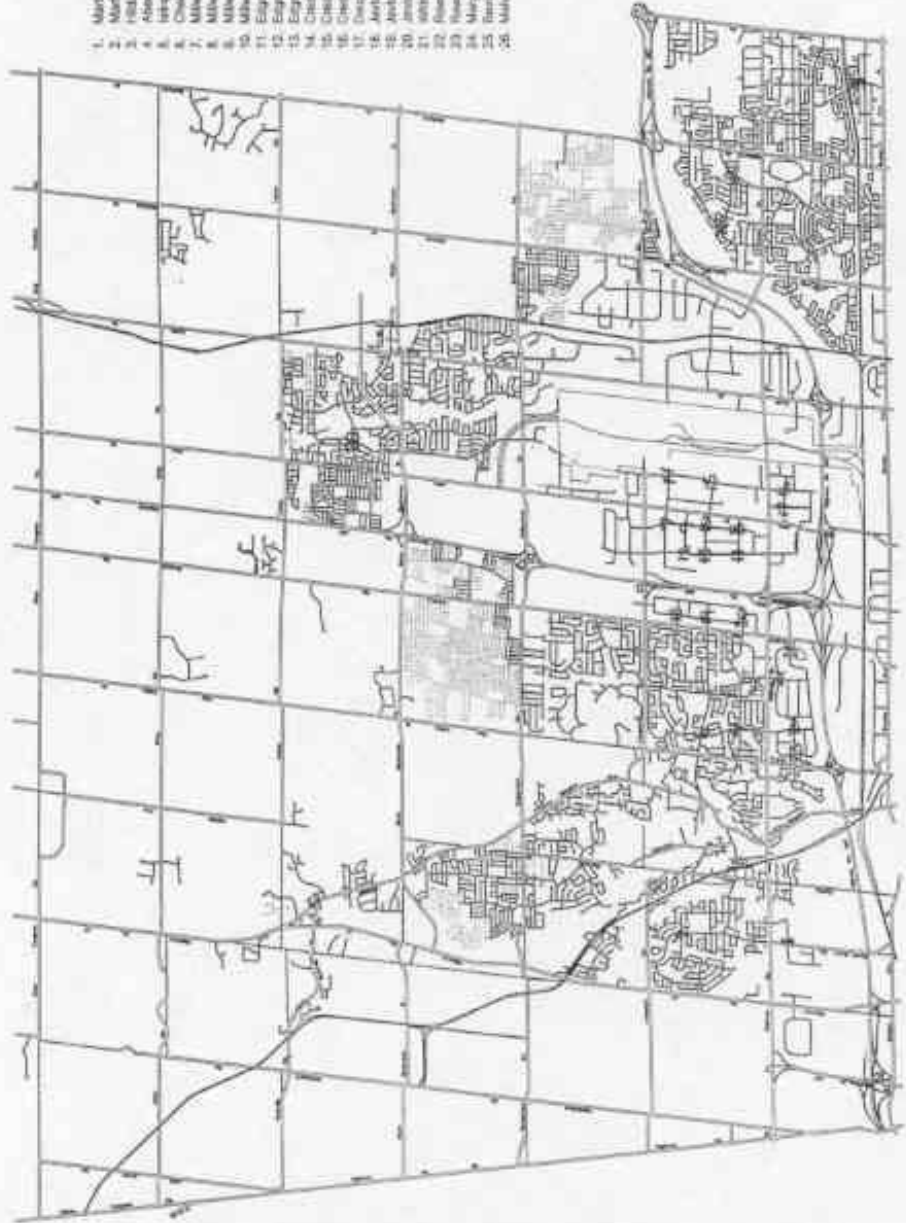


City of Vaughan - Collision Review 2001

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ATTACHMENT No. 3

City of Vaughan - Collision Review 2001 Major Unsignalized Intersections - 2000



1. Main Grove Rd./Woodbine Blvd./Rugby Rd.
2. Main Grove Road/Frost Cris
3. Hills Avenue/Prewood Drive
4. Aberdeen Avenue/Robson Drive
5. Islington Avenue/Hatchells Road
6. Chiswick Drive/Karleen Avenue
7. Midway Avenue/Alpenwood Crescent (North)
8. Midway Avenue/Alpenwood Crescent (South)
9. Midway Avenue/Chiswick Avenue
10. Midway Avenue/Prewood Avenue
11. Eagles Blvd./Alpenwood Crescent (South)
12. Eagles Blvd./Knox Road
13. Eagles Blvd./Knox Road
14. Chiswick Road/Frost Road
15. Chiswick Road/Mcintosh Road
16. Chiswick Road/Doughan Road
17. Douglas Road/McIntosh Road
18. Arden Drive/Skyway Road
19. Arden Drive/Crossman Road
20. Arden Drive/Crossman Road
21. Whitmore Avenue/Tramers Road
22. Rossmore Quay (Front/Whites Road)
23. Rossmore Quay (Front/Whites Drive)
24. Mayfield Avenue/Strada Drive
25. Beverly Glen Road/Strada/Whit Road/Strada
26. Malibu Avenue/Curryingham Drive



ATTACHMENT #4
City of Vaughan
Collision Review 2001 - Major Unsignalized Intersections

Intersection Number	Intersection Location	Block	At-Grade Stop	Surrounding Area	AADT	Collisions/Year					Collision Rate (collisions/mile)				
						1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
1	Mainline Grove Road/Woodhurst Boulevard/Regina Road	B50	No	Industrial	19500	1	3	5	0	0	0.14	0.42	0.70	0.00	
2	Martin Grove Road/Forest Drive	B51	Yes	Residential	11600	0	1	0	0	0	0.00	0.24	0.00	0.00	
3	Fidda Avenue/Phirewood Drive	B1	Yes	Residential	15600	3	2	3	2	0	0.52	0.34	0.52	0.34	
4	Abenison Avenue/Embassy Drive	B37	Yes	Residential	9500	1	2	0	0	0	0.28	0.56	0.00	0.00	
5	Inglinton Avenue/Nashville Road	B04	Yes	Manufacturing	10000	0	0	0	0	0	0.00	0.00	0.00	0.00	
6	Chancellor Drive/Aspenlea Avenue	B37	Yes	Residential	11200	0	0	4	2	0	0.00	0.00	0.00	0.49	
7	Milway Avenue/Nightwood Crescent (North)	B30	Yes	Industrial	7500	0	2	1	1	1	0.00	0.73	0.37	0.37	
8	Milway Avenue/Applewood Crescent (South)	B30	Yes	Industrial	7400	1	5	1	1	1	0.37	1.85	0.37	0.37	
9	Milway Avenue/Cedermill Avenue	B30	Yes	Industrial	5000	0	0	0	0	0	0.00	0.00	0.00	0.00	
10	Milway Avenue/Tennsylvania Avenue	B30	Yes	Industrial	4600	0	0	0	1	0	0.00	0.00	0.00	0.42	
11	Edgely Shulvart/Applewood Crescent (South)	B30	Yes	Industrial	12300	0	1	4	1	0	0.00	0.22	0.95	0.22	
12	Edgely Boulevard/Cedermill Avenue	B30	No	Industrial	9000	0	0	0	0	0	0.00	0.00	0.00	0.00	
13	Edgely Boulevard/Therapsyria Avenue	B30	Yes	Industrial	11700	1	0	1	2	0	0.21	0.00	0.23	0.47	
14	Creditons Road/Pipin Road	B23	No	Industrial	8500	0	0	0	0	0	0.00	0.00	0.00	0.00	
15	Creditons Road/Machloch Boulevard	B23	No	Industrial	10800	0	1	2	1	0	0.00	0.25	0.50	0.25	
16	Creditons Road/Doughlin Road	B22	Yes	Industrial	8100	1	2	1	0	0	0.34	0.66	0.34	0.00	
17	Doughlin Road/Magdelenic Hotel	B22	Yes	Industrial	5200	2	1	0	0	0	1.05	0.53	0.00	0.00	
18	Jordan Drive/Royals Road	B30	Yes	Industrial	12100	0	2	0	1	0	0.00	0.45	0.00	0.29	
19	Jordan Drive/Carlson Road	B30	Yes	Industrial	8600	0	0	0	0	0	0.00	0.00	0.00	0.00	
20	Jordan Drive/Charles Road	B50	Yes	Industrial	16700	0	4	4	2	0	0.00	0.66	0.66	0.33	
21	Wilmore Road/Towers Road/Wingles Road	B36	Yes	Industrial	13000	5	2	4	1	1	1.05	0.42	0.44	0.21	
22	Rowntree Dairy Road/Wingles Road/Ann Park Circle	B36	No	Industrial	8200	1	5	5	6	0	0.35	1.67	1.67	2.07	
23	Rowntree Dairy Road/Stralla Drive	B36	Yes	Industrial	18600	0	3	4	2	0	0.00	0.44	0.69	0.29	
24	Marycroft Avenue/Stralla Drive	B36	Yes	Industrial	12400	3	4	2	1	0	0.60	0.68	0.44	0.22	
25	Beverly Glen Boulevard/Morris Boulevard	B9	No	Residential	7000	0	0	0	1	0	0.00	0.00	0.00	0.39	
26	McVies Avenue/Carrington Drive	B26	Yes	Residential	5700	0	0	0	1	0	0.00	0.00	0.00	0.48	

Feasible
 *Kleinburg refers to Kleinburg Village
 AADT - Annual Average Daily Traffic
 mve - million vehicles entering